As filed with the Securities and Exchange Commission on June 25, 2021

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM S-1

REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

Rapid Micro Biosystems, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**3826**	**20-8121647**
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification No.)

1001 Pawtucket Boulevard West, Suite 280
Lowell, Massachusetts 01854
978-349-3200

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Robert Spignesi
President and Chief Executive Officer
Rapid Micro Biosystems, Inc.
1001 Pawtucket Boulevard West, Suite 280
Lowell, Massachusetts 01854
978-349-3200

(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

Stephen W. Ranere	**Edwin M. O'Connor**
Wesley C. Holmes	**Mitchell S. Bloom**
Latham & Watkins LLP	**Goodwin Procter LLP**
200 Clarendon Street	**100 Northern Avenue**
Boston, MA 02116	**Boston, MA 02210**
(617) 948-6000	**(617) 570-1000**

Approximate date of commencement of proposed sale to the public: As soon as practicable after the effective date of this Registration Statement.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box. ☐

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☐	**Accelerated filer ☐**
Non-accelerated filer ☒	**Smaller reporting company ☒**
	Emerging growth company ☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	**Proposed maximum aggregate offering price(1)**	**Amount of registration fee(2)**
Class A Common Stock, $0.01 par value per share	$100,000,000	$ 10,910

(1) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(o) under the Securities Act of 1933, as amended. Includes the aggregate offering price of additional shares that the underwriters have the option to purchase.

(2) Calculated pursuant to Rule 457(o) based on an estimate of the proposed maximum aggregate offering price.

The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933 or until the Registration Statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

Subject to Completion, dated June 25, 2021

Preliminary prospectus

shares

Rapid Micro Biosystems, Inc.

Class A Common stock

This is an initial public offering of shares of Class A common stock by Rapid Micro Biosystems, Inc. Prior to this offering, there has been no public market for our shares of Class A common stock. The initial public offering price is expected to be between $ and $ per share.

We have applied for listing of our Class A common stock on The Nasdaq Global Market under the symbol "RPID."

Following this offering, we will have two classes of common stock: Class A common stock and Class B common stock. The rights of the holders of Class A common stock and Class B common stock are identical, except with respect to voting and conversion. Each share of Class A common stock will be entitled to one vote and shares of Class B common stock will be non-voting, except as may be required by law. Each share of Class B common stock may be converted at any time into one share of Class A common stock at the option of its holder, subject to the ownership limitations provided for in our restated certificate of incorporation to become effective upon the closing of this offering.

We are an "emerging growth company" under the federal securities laws and are subject to reduced public company reporting requirements. See "Prospectus Summary — Implications of Being an Emerging Growth Company and a Smaller Reporting Company."

	Per share	Total
Initial public offering price	$	$
Underwriting discounts and commissions[(1)]	$	$
Proceeds, before expenses, to us	$	$

(1) See "Underwriting" for additional disclosure regarding underwriting discounts and commissions and estimated offering expenses.

We have granted the underwriters a 30-day option to purchase up to additional shares of Class A common stock from us at the initial public offering price less the underwriting discounts and commissions.

Investing in our Class A common stock involves a high degree of risk. See the section entitled "Risk Factors" beginning on page 17 to read about factors you should consider before buying shares of our Class A common stock.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

The underwriters expect to deliver the shares of Class A common stock to purchasers on or about , 2021.

Joint Book-Running Managers

J.P. Morgan **Morgan Stanley** **Cowen** **Stifel**

, 2021

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Neither we nor the underwriters have authorized anyone to provide any information or to make any representations other than those contained in this prospectus or in any free writing prospectuses prepared by or on behalf of us or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This prospectus is an offer to sell only the shares of Class A common stock offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. The information contained in this prospectus or in any applicable free writing prospectus is current only as of its date, regardless of its time of delivery or any sale of shares of our Class A common stock. Our business, financial condition, results of operations and prospects may have changed since that date.

Through and including , 2021 (25 days after the commencement of this offering), all dealers effecting transactions in these securities, whether or not participating in this offering, may be required to deliver a prospectus. This delivery requirement is in addition to the obligation of dealers to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

We have proprietary rights to trademarks, trade names and service marks appearing in this prospectus that are important to our business. Solely for convenience, the trademarks, trade names and service marks may appear in this prospectus without the ® and TM symbols, but any such references are not intended to indicate, in any way, that we forgo or will not assert, to the fullest extent under applicable law, our rights or the rights of the applicable licensors to these trademarks, trade names and service marks. All trademarks, trade names and service marks appearing in this prospectus are the property of their respective owners.

For investors outside the United States: Neither we nor the underwriters have done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of Class A common stock and the distribution of this prospectus outside the United States.

Prospectus summary

This prospectus summary highlights, and is qualified in its entirety by, the more detailed information and financial statements included elsewhere in this prospectus. This summary does not contain all of the information that may be important to you in making your investment decision. You should read this entire prospectus carefully, including the sections titled "Risk Factors," "Special Note Regarding Forward-Looking Statements" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and the related notes included elsewhere in this prospectus before deciding to invest in our Class A common stock.

Defining the future of pharmaceutical quality control

We are leading a global transformation toward fully automated microbial quality control within pharmaceutical manufacturing. Our products safeguard the most complex and critical bioprocessing workflows in the industry, enabling faster, safer, and higher capacity drug production. Through our unique expertise at the intersection of microbiology, robotic systems, and advanced vision algorithms, we are setting the foundation for end-to-end quality control automation to enable the future of advanced pharmaceutical manufacturing.

Overview

We are an innovative life sciences technology company providing mission critical automation solutions to facilitate the efficient manufacturing and fast, safe release of healthcare products such as biologics, vaccines, cell and gene therapies, and sterile injectables. Our flagship Growth Direct platform automates and modernizes the antiquated, manual microbial quality control, or MQC, testing workflows used in the largest and most complex pharmaceutical manufacturing operations across the globe. The Growth Direct platform brings the quality control lab to the manufacturing floor, unlocking the power of in-line/at-the-line MQC automation to deliver faster results, greater accuracy, increased operational efficiency, better compliance with data integrity regulations, and quicker decision making that our customers rely on to ensure safe and consistent supply of important healthcare products.

The only fully automated, high-throughput and secure MQC solution


Broad application suite & easy sample collection


High capacity & high throughput testing


Fully automated handling & traceability of samples


Rapid detection & enumeration


Robust security & data integrity


>99% uptime to support mission critical MQC testing applications

Our Growth Direct platform is the only fully automated, high-throughput and secure MQC solution. Developed with over 15 years of active feedback from our customers, the Growth Direct system was purpose-built to meet the MQC challenges posed by the increasing scale, complexity, and regulatory scrutiny confronting global

pharmaceutical manufacturers. Our platform delivers the robust and scalable MQC automation necessary to support rapidly expanding demand for novel and complex therapeutic modalities, such as biologics, vaccines, cell and gene therapies, and sterile injectables. Our systems are designed to absorb and automate the vast majority of daily MQC test volume in any pharmaceutical manufacturing facility and can be operated in networked fleets of multiple systems per facility or campus to scale up with high-volume manufacturing.

MQC is a ubiquitous and critical testing process, executed daily at massive scale globally, that ensures pharmaceutical manufacturing facilities and products are free of microbial contamination from exogenous microorganisms such as bacteria, mold, and other foreign substances. MQC ensures the safety of final drug products released for patient use, via the constant testing for microbial contamination of raw materials, production environments, personnel, and in-process and final sterility testing for drug products. A single drug production facility may conduct anywhere from tens of thousands to over one million MQC tests per year to ensure product quality. This testing is mandated and closely monitored by the U.S. Food and Drug Administration, or FDA, and other global regulatory agencies to ensure the safety of all pharmaceutical products, with serious regulatory and financial consequences for lack of compliance. Companies that have failed to pass FDA MQC audits have been subject to repeat FDA Form 483s, warning letters, complete response letters, extended plant shutdowns, and substantial product scrap and remediation costs. An FDA Form 483 is issued by the FDA at the conclusion of an inspection for conditions that may constitute violations of the Federal Food, Drug, and Cosmetic Act or other laws and regulations enforced by the FDA.

The traditional method to conduct MQC testing is “growth promotion” in which samples are manually collected on media plates by MQC specialists, manually processed and incubated at various temperature conditions, and visually inspected for growing colonies, which indicate the presence of microorganisms. The benefit of this long-standing method is that it is trusted — a colony growing on media strongly implies the existence of viable, potentially contaminating organisms growing in the location or sample from which the assay was collected. However, the traditional method presents substantial cost and risk to manufacturers, principally because the process is slow to deliver results, entirely dependent on human labor, subject to technician fallibility and error, unsecured, and non-compliant with data integrity regulations. For these reasons, manual traditional MQC has become antiquated and is unable to match the growing scale of complex bioprocessing.

Our Growth Direct platform improves the traditional MQC process, maintaining the fundamental trusted method of growth promotion, but applying advanced robotic automation, powerful optical imaging, algorithmic vision analysis, and data management to render it more scalable and efficient for the future of advanced pharmaceutical manufacturing. Our proprietary technology works by replacing human counting of growing colonies with software and algorithm detection and counting based on image analysis. We exploit the natural autofluorescent properties of microbial organisms to count microcolonies by detecting minute changes to their brightness over time using proprietary vision algorithms, without any new reagents or additional sample prep. Our system wraps this core detection technology with fully automated, high-volume, walk-away robotic sample handling and incubation, locked behind a secured interface that enables compliance with data integrity regulations.

Growth Direct accelerates time to results by several days, a 50% improvement over the traditional method, and reduces MQC testing to a simple two-step workflow, eliminating 85% of the manual steps of traditional MQC, generating significant time, operational, and cost savings for our customers. Moreover, our platform increases accuracy and efficiency through full automation of the MQC process. Customers depend on Growth Direct’s robust security, connectivity, and data integrity capabilities, reinforced by its high reliability with >99% uptime.

We believe the MQC market is poised for disruption and modernization via the widespread deployment of our Growth Direct platform, and we have embarked on the mission of transforming the MQC test market to standardize on our fully automated MQC solution.

On a global scale, we estimate nearly 350 million MQC tests are conducted annually in thousands of dedicated pharmaceutical manufacturing facilities responsible for producing billions of doses of therapeutics every year. We estimate our total addressable market, or TAM, to be approximately $10 billion in 2021, which we expect to grow to over $14 billion by 2026. We based our estimated TAM on total potential demand for our products derived

from research we commissioned conducted by Health Advances LLC and our current pricing. Our TAM includes both a system sales opportunity and a recurring opportunity from sales of consumables and service contracts, the latter of which is estimated to be approximately $5 billion in 2021. As we embed our products within global pharmaceutical manufacturing operations and begin to automate and digitize their workflows, we believe our platform is exceptionally well-positioned to enable the future of quality control automation and unlock further significant TAM expansion opportunities.

We employ direct commercial and service teams that drive the adoption of our products globally. We create a superior user experience from pre-sales, to onboarding, consultative validation services, onsite technical training, and continued customer support throughout our relationship. We have a scalable commercial infrastructure including a direct sales force in North America and Europe. This is supplemented with an extensive and highly specialized customer service and validation infrastructure. This infrastructure ensures successful on-boarding of the Growth Direct system through both initial validation and follow-on purchases throughout the entire customer site network, where the highest volume sites may require dozens of Growth Direct systems. We currently have customers across approximately 70 sites in 14 countries and the majority of our customers have multiple Growth Direct systems and have deployed the Growth Direct platform across multiple facility locations.

We launched the latest generation of the Growth Direct system in 2017 and have placed over 100 systems and sold over 1 million consumables globally. Our customer base includes over half of the top 20 pharmaceutical companies as measured by revenue and 30% of globally approved cell and gene therapies. Once installed and validated in our customers' facilities, the Growth Direct system provides for recurring revenues through ongoing consumables and service contracts. Based on the significant value that our Growth Direct platform provides to our customers, we have experienced strong organic growth over the last two fiscal years, despite the impact of the COVID-19 pandemic, resulting in combined product and service revenue of $11.5 million and $14.1 million for the fiscal years ended December 31, 2019 and 2020, respectively, representing an annual growth rate of 22.9%. We generated net losses of $21.2 million and $37.1 million for 2019 and 2020, respectively.

We seek to establish the Growth Direct platform as the trusted global standard in automated MQC by delivering the speed, accuracy, security, data integrity and regulatory compliance that our customers depend on to ensure patient safety and consistent drug supply.

Our strengths

The following competitive strengths allow us to capitalize on our first-mover advantage and further establish our leadership position in automating the MQC testing market:

- *Proprietary technology platform offering best-in-class automated and secure MQC testing, built on investment and patent-protected innovation across multiple technology disciplines.*
- *Top-tier customer collaborators validating and establishing the Growth Direct platform as an industry standard globally.*
- *Deep integration within heavily regulated pharmaceutical manufacturing processes.*
- *Highly attractive business model that leverages our growing installed base of systems to generate persistent recurring revenues through consumables and service contracts.*
- *Ability to leverage our extensive regulatory expertise to better serve our customers' needs.*
- *Experienced management team and workforce with deep domain knowledge.*

Our industry background

MQC is the principal method by which pharmaceutical manufacturers ensure the ongoing sterility of their facilities and finished products by detecting and stopping contamination from any outside microorganisms, such as bacteria, mold, and other foreign substances. MQC is a critical component of the bioprocess and pharmaceutical production process and is regulated and mandated by the FDA under current good manufacturing practice, or

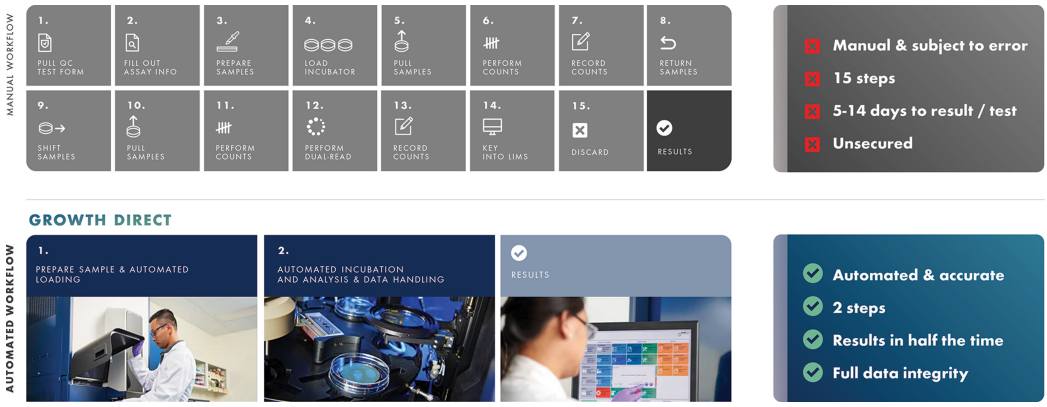
cGMP, and by other international regulatory agencies. MQC testing occurs across the entire manufacturing workflow, with increasingly stringent controls as the process nears final product release.

Current MQC methods are extremely laborious and time consuming, suffering from lack of any meaningful innovation for decades. A typical traditional MQC workflow can require 15 individual manual processing steps, including hand labeling and inventory, multiple rounds of sample handling and transport, multiple human visual reads, and hand transcription of data between paper and electronic recording systems — all nodes that generate operational inefficiencies and increase risk. As a result, the traditional method of MQC poses several operational challenges, including:

- Slow time to results, ranging from 5-14 days, which delays response to contaminations.
- Result subjectivity stemming from variability between MQC specialists.
- Vulnerability to human errors and falsification in handling of samples and recording data.
- Lack of data integrity and audit controls.
- Lack of scalability due to intensive labor needs.

In time-sensitive, highly regulated pharmaceutical manufacturing operations, these process vulnerabilities can expose organizations to significant operational, financial, and reputational risks, including loss of valuable product batches, reduced manufacturing capacity, lengthy regulatory investigations, costly enforcement actions, and delayed release of life-saving products.

Traditional MQC method vs. Growth Direct platform



Our Growth Direct platform accelerates time to results by several days, a 50% improvement over the traditional method, and reduces MQC testing to a simple two-step workflow, eliminating 85% of the manual steps of traditional MQC, generating significant time, operational, and cost savings for our customers.

Our core technology and approach

To date, prior technology products have not succeeded in automating MQC workflows at scale as a consequence of being too slow, too small, or too difficult to validate. We pioneered our Growth Direct platform to fully automate and digitize the proven growth promotion MQC method.

The first key component of the core Growth Direct technology is our vision-based detection and enumeration. The Growth Direct system relies on a fundamental property of all microorganisms — they contain cellular components required for growth, called flavins and flavoproteins, that autofluoresce, or glow, under certain light wavelengths without the addition of extraneous reagents. Our proprietary system detects the autofluorescence

of bacterial or fungal microcolonies by illuminating them with blue-spectrum light and directing the resulting green-spectrum signal onto a Charged-Coupled Device, or CCD, chip — an array of independent photosensitive pixel elements. Our image analysis software uses vision algorithms to interpret these light signals and counts the clusters of illuminated pixels representing each microcolony. As a result, our system detects microorganism growth at the microcolony stage (~100 cells), which typically occurs in half the time required for detection of visible colonies by eye (~10 million cells).

This method is non-destructive which ensures that detected colonies represent actual viable microbial contaminations and allows the organisms to be grown into visible colonies for subsequent microbial identification for root cause investigation and remediation follow-up.

The second key component of our Growth Direct technology is our walk-away high-throughput automation capability. The Growth Direct system fully handles samples from start to finish without human intervention, automatically managing sample intake, incubation, imaging, secure paperless data management and disposal. This substantially reduces labor associated with MQC and virtually eliminates the risk of human operator error.

Integrated in the Growth Direct system, our technologies result in an automated method that is faster, more efficient, more secure, and more reliable than the traditional method. We believe several factors differentiate our Growth Direct technology as the leader in full MQC automation:

- *Faster results in half the time at higher testing throughputs and capacity;*
- *Ability to absorb the vast majority of daily MQC testing in any facility;*
- *Increased accuracy through full automation;*
- *Increased process efficiency;*
- *Robust security, connectivity and data integrity;*
- *High reliability with >99% uptime; and*
- *Regulatory acceptance with a clear path to validation.*

Our products and services

Our Growth Direct platform automates the growth promotion method of MQC and enables customers to perform this critical testing process more efficiently, accurately, and securely. Our platform comprises the Growth Direct system, proprietary consumables, laboratory information management system, or LIMS, connection software, and comprehensive customer support and validation services.

Growth Direct System

Environmental Monitoring Consumable

Water / Bioburden Consumable

Our Growth Direct system is a fully automated, high throughput instrument for daily processing of MQC samples on our consumables — a microbiology quality control lab in a box. The Growth Direct system contains two high-capacity incubators, an advanced imaging system and internal robotics for sample handling. The system enables walk-away bulk sample loading, holding 700 of our consumables per instrument. Its dual, independently controlled incubators automatically manage multi-temperature incubation protocols. Onboard imaging and vision software detects and counts microbial growth, delivering test results in half the time of the manual method.

Our proprietary consumables are designed to facilitate high-throughput automated handling and image processing with our Growth Direct system. Our consumables cover the majority of the daily high volume routine tests to include environmental monitoring (EM), water (W), and bioburden (BB) testing and incorporate multiple standard growth media. Our consumables enable microbial growth using the same growth promotion method as conventional MQC plates, but incorporate specific mechanical, optical, and tracking management features to facilitate automated handling, image processing within our Growth Direct system, and data integrity compliance.

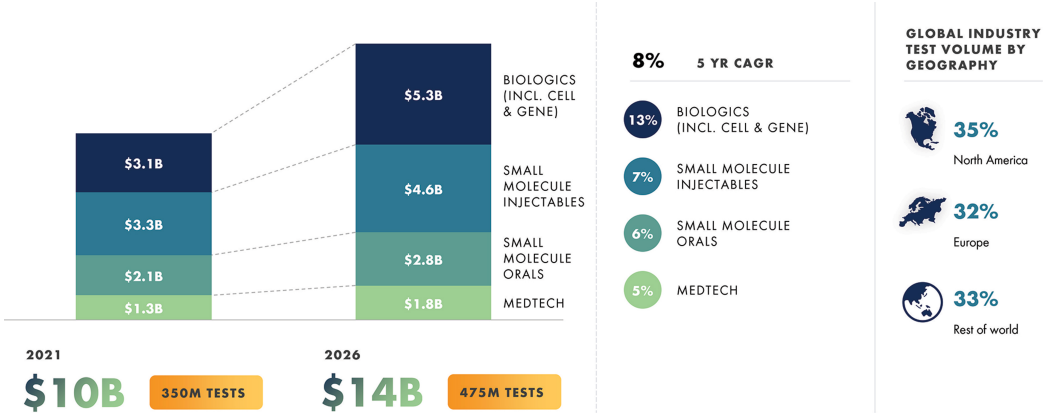
In addition, we are developing a growth-based rapid automated sterility test for use on the Growth Direct system. Rapid sterility tests are utilized for final release testing in any facility that manufactures sterile products such as biologics and sterile injectables, and are especially valuable in vaccine manufacturing to enable faster release and greater capacity, and in cell and gene therapy manufacturing environments given the challenging balance of purity, contamination control, and speed required in the manufacturing of those products. The traditional method of sterility testing requires at least 14 days for results, causing delays or requiring releasing product at risk. When commercialized, we expect our rapid sterility test will reduce the traditional method's 14-day time to results by at least 50%, permitting faster final release, with the goal of speeding critical drugs and vaccines to market, accelerating customer revenue recognition, and reducing inventory costs. Our development program is supported by contract funding from the U.S. Department of Health and Human Services Biomedical Advanced Research & Development Authority, which is supporting the development of improvements in vaccine production methods that accelerate the availability of vaccines against viruses with pandemic potential.

Our LIMS connection software offers two-way integration with LIMS, enabling a paperless workflow. This eliminates the risk of human error that could arise from manually entering results and improves efficiency. Our LIMS connection software delivers information to stakeholders in a secure manner, designed to enable compliance with data integrity regulations. Moreover, each system is fully enabled with remote management that allows our customer service teams to interact with our system fleet globally based on customer permission levels to ensure maximum system availability and lower cost of service. This capability enables the potential to expand the Growth Direct platform into data storage, information analysis, and related products and services.

Our products are backed by world-class customer service, validation, field service (including installation) and service contracts. Our comprehensive value-added services help our customers get online faster, deliver the reliable uptime they expect for this critical function, and produce the operational value and benefits that they seek. In doing so, we keep our customers' manufacturing facilities online longer, reduce labor costs, prevent quality control errors, and help them make faster decisions.

Our market

We estimate our TAM to be approximately $10 billion in 2021, which we expect to grow to over $14 billion by 2026, representing a 5-year compound annual growth rate, or CAGR, of approximately 8%. We based our estimated TAM on total potential demand for our products derived from research we commissioned conducted by Health Advances LLC and our current pricing. As shown below, we broadly target all companies that manufacture regulated healthcare products, including biologics, cell and gene therapies, vaccines, small molecule injectable dosages, small molecule oral dosages, and medical devices, which in aggregate perform approximately 350 million MQC tests annually. Our TAM includes both a system sales opportunity and a recurring opportunity from sales of consumables and service contracts, the latter of which is estimated to be approximately $5 billion in 2021.



We are particularly focused on serving the high-growth biologics, cell, and gene therapy markets, which have the highest MQC testing intensity per batch of manufactured product. MQC testing for these complex therapeutic modalities is forecasted to grow at a 10-30% CAGR through 2026. These advanced modalities require automation to support the scale-up of their complex multi-step manufacturing processes. This is particularly true for the emerging cell and gene therapy category, which is driving the need for faster, more efficient manufacturing and an associated expansion in global bioprocessing capacity. Thirty percent of globally approved cell and gene therapy products use the Growth Direct platform to automate MQC, and the remaining 1,000+ cell and gene therapies in Phase 1 to 3 clinical trials represent a significant opportunity for our business. We seek to drive substantial growth by establishing the Growth Direct platform as the global standard for MQC automation in advanced bioprocessing for biologics, cell, and gene therapies.

Our business is further well-positioned to execute on several TAM expansion opportunities. We believe there is an opportunity to expand our existing automated MQC testing solution in adjacent markets such as personal care product manufacturing, where our Growth Direct platform is currently in use and which we estimate presents an approximately $8 billion opportunity with an estimated 270 million MQC tests annually. We based this estimated TAM on total potential demand for our products derived from research we commissioned conducted by Health Advances LLC and our current pricing. We also intend to develop services and products to allow us to deliver integrated QC workflows not currently addressed by our Growth Direct platform, which we estimate represents an approximately $10 billion opportunity. We based this estimated TAM on potential demand derived from our own market research and current pricing of comparable integrated products in other markets. Combined with our core TAM, we believe these expansion opportunities could increase our potential TAM to $32 billion.

Our growth strategy

We are focused on the near-term goal of standardizing the MQC test market on our fully automated Growth Direct platform and the long-term mission of delivering MQC lab automation across the healthcare product manufacturing industry. Our growth strategy in pursuit of this vision includes the following elements:

- *Leverage our first-mover advantage and our industry leadership to cement the Growth Direct platform as the new standard of MQC automation in the rapidly growing bioprocessing market, including biologics, cell, and gene therapy manufacturing.*
- *Drive new customer adoption of the Growth Direct platform by converting the leading manufacturers in our core markets, including but not limited to the top 50 pharmaceutical companies and leading contract development and manufacturing organizations, or CDMOs.*
- *Expand implementation of the Growth Direct platform within our existing customer base by deploying additional systems across their global manufacturing site network and driving increased application utilization and consumable pull through on a system-by-system basis*.

- *Increase the value of our platform by innovating and launching new applications, hardware, and software products that deliver the power of integrated automation across our customers' MQC workflows*.
- *Expand the Growth Direct platform into adjacent end markets with high volumes of manual MQC testing.*
- *Pursue opportunistic strategic investments, partnerships, and acquisitions to strengthen our product platform, allow us to enter new markets, and enhance our growth profile.*

Summary risk factors

Our business is subject to a number of risks of which you should be aware before making an investment decision. These risks are discussed more fully in the "Risk Factors" section of this prospectus immediately following this prospectus summary. These risks, among others, include the following:

- The COVID-19 pandemic has impacted, and may continue to impact, our operations and may materially and adversely affect our business and financial results;
- We have incurred significant losses since inception, we expect to incur losses in the future and we may not be able to generate sufficient revenue to achieve and maintain profitability;
- We may need to raise additional capital to fund our existing operations, improve our platform or develop and commercialize new products or expand our operations;
- Our revenue has been primarily generated from sales of our Growth Direct system, proprietary consumables and LIMS connection software, which require a substantial period of time to generate recurring revenue;
- We may be unable to manage our future growth effectively, which could make it difficult to execute our business strategy;
- We have limited experience in marketing and sales, and if we are unable to expand our marketing and sales organization to adequately address our customers' needs or to expand our customer base, our business may be adversely affected;
- We must develop new products, adapt to rapid and significant technological change and respond to introductions of new products by competitors to remain competitive;
- The continued success of our business relies heavily on establishing and maintaining our position in the market as a leading provider of automated MQC testing;
- If our sole manufacturing and development facility becomes damaged or inoperable or we are required to vacate our existing facility, our ability to conduct and pursue our manufacturing and development efforts will be jeopardized;
- Our manufacturing operations are dependent upon third-party suppliers, including single-source suppliers, making us vulnerable to supply shortages and price fluctuations, which could harm our business;
- If we lose key management, cannot recruit qualified employees, directors, officers or other significant personnel or experience increases in our compensation costs, our business may be materially harmed;
- We may acquire businesses or form joint ventures or make investments in other companies or technologies that could negatively affect our operating results, dilute our stockholders' ownership, increase our debt or cause us to incur significant expense;
- Our customers use our Growth Direct platform as part of their quality-control workflow, which is subject to regulation by the FDA and other comparable regulatory authorities;
- If we fail to maintain effective internal control over financial reporting and effective disclosure controls and procedures, we may not be able to accurately report our financial results in a timely manner or prevent fraud, which may adversely affect investor confidence in our company;
- If we are unable to obtain and maintain sufficient intellectual property protection for our technology, including the Growth Direct platform, or if the scope of the intellectual property protection obtained is not sufficiently

broad, our competitors could develop and commercialize products similar or identical to ours, and our ability to successfully commercialize our products may be impaired;

- Because we do not anticipate paying any cash dividends on our Class A common stock in the foreseeable future, capital appreciation, if any, would be your sole source of gain;
- Provisions in our restated certificate of incorporation and amended and restated bylaws and under Delaware law could make an acquisition of our company, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management;
- The market price of our Class A common stock may be volatile and fluctuate substantially, which could result in substantial losses for purchasers of our Class A common stock in this offering; and
- Sales of a substantial number of shares of our Class A common stock in the public market, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our Class A common stock.

Implications of being an emerging growth company and a smaller reporting company

We qualify as an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, as amended, or JOBS Act. As an "emerging growth company," we may take advantage of reduced reporting requirements that are generally otherwise applicable to public companies. These provisions include, but are not limited to:

- the option to present only two years of audited financial statements and only two years of related "Management's Discussion and Analysis of Financial Condition and Results of Operations" in this prospectus;
- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements (i.e., an auditor discussion and analysis);
- reduced disclosure obligations regarding executive compensation in our periodic reports, proxy statements and registration statements; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We may take advantage of these provisions until the last day of our fiscal year following the fifth anniversary of the completion of this offering. However, if any of the following events occur prior to the end of such five-year period, (i) our annual gross revenue are $1.07 billion or more, (ii) we issue more than $1.0 billion of non-convertible debt in any three-year period or (iii) we become a "large accelerated filer" (as defined in Rule 12b-2 under the Securities Exchange Act of 1934, as amended, or the Exchange Act), we will cease to be an emerging growth company prior to the end of such five-year period. We will be deemed to be a "large accelerated filer" at such time that we (a) have an aggregate worldwide market value of common equity securities held by non-affiliates of $700 million or more as of the last business day of our most recently completed second fiscal quarter, (b) have been required to file annual and quarterly reports under the Exchange Act, for a period of at least 12 months and (c) have filed at least one annual report pursuant to the Exchange Act. Even after we no longer qualify as an emerging growth company, we may still qualify as a "smaller reporting company," which would allow us to take advantage of many of the same exemptions from disclosure requirements including reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports and proxy statements.

We have elected to take advantage of certain of the reduced disclosure obligations in the registration statement of which this prospectus is a part and may elect to take advantage of other reduced reporting requirements in future filings. As a result, the information that we provide to our stockholders may be different than you might receive from other public reporting companies in which you hold equity interests.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards.

We are also a “smaller reporting company” as defined under the Securities Act and Exchange Act. We may continue to be a smaller reporting company so long as either (i) the public float of our Class A common stock and Class B common stock held by non-affiliates is less than $250 million or (ii) our annual revenue was less than $100 million during the most recently completed fiscal year and the public float of our Class A common stock and Class B common stock held by non-affiliates is less than $700 million. If we are a smaller reporting company at the time we cease to be an emerging growth company, we may continue to rely on exemptions from certain disclosure requirements that are available to smaller reporting companies. Specifically, as a smaller reporting company, we may choose to present only the two most recent fiscal years of audited financial statements in our Annual Report on Form 10-K and have reduced disclosure obligations regarding executive compensation, and, similar to emerging growth companies, if we are a smaller reporting company under the requirements of (ii) above, we would not be required to obtain an attestation report on internal control over financial reporting issued by our independent registered public accounting firm.

As a result of these elections, some investors may find our Class A common stock less attractive than they would have otherwise. The result may be a less active trading market for our Class A common stock, and the price of our Class A common stock may become more volatile.

Corporate information

We were incorporated under the laws of the state of Delaware in 2006 under the name Rapid Micro Biosystems, Inc. Our principal executive offices are located at 1001 Pawtucket Boulevard West, Suite 280, Lowell, Massachusetts 01854 and our telephone number is 978-349-3200. Our website address is *www.rapidmicrobio.com*. The information contained in, or accessible through, our website does not constitute a part of this prospectus. We have included our website address in this prospectus solely as an inactive textual reference.

The offering

Class A Common stock offered by us	Shares.
Underwriters' option to purchase additional shares	We have granted the underwriters an option to purchase up to additional shares of Class A common stock from us. The underwriters can exercise this option at any time within 30 days from the date of this prospectus.
Class A Common stock to be outstanding after this offering	shares (or shares if the underwriters exercise their option to purchase additional shares in full).
Class B common stock to be outstanding after this offering	shares
Total shares of common stock to be outstanding after this offering	shares
Use of proceeds	We estimate that the net proceeds from this offering will be approximately $ million (or approximately $ million if the underwriters exercise in full their option to purchase additional shares of Class A common stock), at an assumed public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting the estimated underwriting discounts and commissions and the estimated offering expenses payable by us. We anticipate that we will use the net proceeds of this offering for expansion of our commercial resources and capabilities, including sales and marketing, for research and development of our current products and new products, including the exploitation of new pipeline opportunities, to expand our operations globally and for working capital and general corporate purposes. See "Use of Proceeds" beginning on page 57 for additional information.
Voting rights	Following this offering, we will have two classes of common stock: Class A common stock and Class B common stock. The rights of the holders of Class A common stock and Class B common stock are identical, except with respect to voting and conversion. Each share of Class A common stock will be entitled to one vote and shares of Class B common stock will be non-voting, except as may be required by law. Each share of Class B common stock may be converted into one share of Class A common stock at the option of its holder, subject to the ownership limitations provided for in our restated certificate of incorporation to become effective upon the closing of this offering. See ''Description of Capital Stock'' for additional information.
Risk factors	See "Risk Factors" beginning on page 17 and other information included in this prospectus for a discussion of factors that you should consider carefully before deciding to invest in our Class A common stock.

Proposed Nasdaq Global Market symbol	“RPID”

The total number of shares of our common stock to be outstanding after this offering is based on 4,827,360 shares of our Class A common stock and no shares of Class B common stock outstanding as of May 31, 2021, which includes 1,332,255 shares of unvested restricted stock subject to repurchase and excludes:

- 20,847,569 shares of Class A common stock issuable upon exercise of stock options outstanding under our 2010 Stock Option and Grant Plan, or the 2010 Plan, as of May31, 2021, at a weighted-average exercise price of $0.46 per share;
- 2,220,400 shares of Class A common stock issuable upon exercise of stock options granted under our 2010 Plan after May 31, 2021 at a weighted average exercise price of $2.42 per share;
- 279,340 shares of our Class A common stock issuable upon the exercise of certain warrants to purchase Class A common stock outstanding as of May 31, 2021, at a weighted average exercise price of $27.44 per share;
- 3,823,524 shares of our Class A common stock issuable upon the conversion of shares of our Series A1 preferred stock issuable upon the exercise of warrants to purchase our Series A1 preferred stock outstanding as of May 31, 2021 at an exercise price (on an as-converted basis) of $0.01 per share;
- 1,199,994 shares of our Class A common stock issuable upon the conversion of shares of our Series B1 preferred stock issuable upon the exercise of warrants to purchase our Series B1 preferred stock outstanding as of May 31, 2021 at an exercise price (on an as-converted basis) of $0.01 per share;
- 1,195,652 shares of our Class A common stock issuable upon the conversion of shares of our Series C1 preferred stock issuable upon the exercise of warrants to purchase our Series C1 preferred stock outstanding as of May 31, 2021 at an exercise price (on an as-converted basis) of $1.15 per share;
- additional shares of our Class A common stock reserved for future issuance under our 2021 Incentive Award Plan, or the 2021 Plan, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of our Class A common stock reserved for future issuance under our 2021 Plan; and
- shares of our Class A common stock that will become available for future issuance under our 2021 Employee Stock Purchase Plan, or the 2021 ESPP, which will become effective in connection with this offering, and shares of our Class A common stock that become available pursuant to provisions in the 2021 ESPP that automatically increase the share reserve under the 2021 ESPP.

Unless otherwise indicated, this prospectus reflects and assumes the following:

- a -for- stock split of our Class A common stock and Class B common stock , which will become effective prior to the effectiveness of the registration statement of which this prospectus forms a part;
- the automatic conversion of all outstanding shares of our Series A1, B1, C1 and D1 preferred stock into an aggregate of 121,004,726 shares of our Class A common stock and all outstanding shares of our Series C2 and D2 preferred stock into 34,516,907 shares of our Class B common stock, which will occur in connection with the closing of this offering;
- the conversion of all outstanding warrants to purchase shares of our preferred stock to warrants to purchase shares of our Class A common stock, which will occur upon the closing of this offering;
- no exercise of outstanding options or warrants after May 31, 2021;
- no exercise by the underwriters of their option to purchase additional shares of our Class A common stock;
- the filing and effectiveness of our current certificate of incorporation effecting a reclassification of our then outstanding common stock to Class A common stock and authorizing our Class B common stock and the issuance

to ABG WTT-Rapid Limited, or ABG WTT, of 11,437,301 shares of Series C1 preferred stock for an equal number of shares of Series C2 preferred stock and to Ally Bridge MedAlpha Master Fund L.P., or Ally Bridge MedAlpha, of 2,364,509 shares of Series D1 preferred stock in exchange for an equal number of shares of Series D2 preferred stock pursuant to an exchange agreement, in each case, in June 2021; and

- the filing of our restated certificate of incorporation, which will occur upon the closing of this offering.

Summary consolidated financial data

The following tables set forth our summary consolidated financial data as of, and for the periods ended on, the dates indicated. We have derived the consolidated statement of operations data for the years ended December 31, 2019 and 2020 from our audited consolidated financial statements included elsewhere in this prospectus. We have derived the consolidated statement of operations data for the three months ended March 31, 2021 and 2020 and the consolidated balance sheet data as of March 31, 2021 from our unaudited condensed consolidated financial statements included elsewhere in this prospectus, which have been prepared on the same basis as the audited consolidated financial statements. In the opinion of management, the unaudited data reflects all adjustments, consisting only of normal recurring adjustments, necessary for a fair statement of the financial information in those statements. Our historical results are not necessarily indicative of the results that should be expected for any future period and our results for any interim period are not necessarily indicative of results that may be expected for any full year. You should read the following summary consolidated financial data together with the more detailed information contained in “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and our consolidated financial statements and the related notes included elsewhere in this prospectus.

	Years Ended December 31,		Three Months Ended March 31,	
	2019	2020	2020	2021
	(in thousands, except share and per share data)			
Consolidated Statement of Operations Data:				
Revenue:				
Product revenue	$ 9,328	$ 10,992	$ 1,188	$ 3,718
Service revenue	2,128	3,091	410	1,067
Non-commercial revenue	5,056	1,994	1,401	210
Total revenue	16,512	16,077	2,999	4,995
Costs and operating expenses:				
Cost of product revenue	10,627	18,642	3,212	5,510
Cost of service revenue	3,021	3,386	951	1,137
Cost of non-commercial revenue	3,098	2,120	797	414
Research and development	5,429	6,531	1,438	2,147
Sales and marketing	4,047	5,962	1,466	2,275
General and administrative	8,924	9,976	2,371	3,203
Total costs and operating expenses	35,146	46,617	10,235	14,686
Loss from operations	(18,634)	(30,540)	(7,236)	(9,691)
Total other income (expense), net	(2,110)	(6,404)	(751)	(12,391)
Loss before income taxes	(20,744)	(36,944)	(7,987)	(22,082)
Income tax expense	427	134	20	19
Net loss	$ (21,171)	$ (37,078)	$ (8,007)	$ (22,101)
Accretion of redeemable convertible preferred stock to redemption value	(2,745)	(3,745)	(818)	(787)
Cumulative redeemable convertible preferred stock dividends	(2,704)	(4,398)	(788)	(1,411)
Net loss attributable to common stockholders – basic and diluted(1)	$ (26,620)	$ (45,221)	$ (9,613)	$ (24,299)
Net loss per share attributable to common stockholders – basic and diluted(1)	$ (15.34)	$ (25.22)	$ (5.44)	$ (7.58)
Weighted-average common shares outstanding – basic and diluted(1)	1,735,253	1,793,272	1,767,688	3,207,233
Pro forma net loss per share attributable to common stockholders – basic and diluted (unaudited)(2)		$ (0.27)		$ (0.07)
Pro forma weighted-average common shares outstanding – basic and diluted (unaudited) (2)		134,814,912		158,728,866

(1) See Note 15 to our audited consolidated financial statements and Note 15 to our unaudited condensed consolidated financial statements, included elsewhere in this prospectus, for an explanation of the method used to calculate historical basic and diluted net loss per share attributable to common stockholders and the weighted-average common shares outstanding used in the computation of the per share amount.

(2) The unaudited pro forma basic and diluted net loss per share attributable to common stockholders for the year ended December 31, 2020 and the three months ended March 31, 2021 have been prepared to give effect to adjustments arising upon the completion of a qualified initial public offering. The unaudited pro forma net loss attributable to common stockholders used in the calculation of unaudited pro forma basic and diluted net loss per share attributable to common stockholders does not include the effect of accretion of redeemable convertible preferred stock to redemption value or the cumulative redeemable convertible preferred stock dividends and the change in the fair value of preferred stock warrant liability, because the calculation gives effect to (i) the filing and effectiveness of our current certificate of incorporation effecting a reclassification of our then outstanding common stock to Class A common stock and authorizing our Class B common stock and the issuance to ABG WTT of 11,437,301 shares of Series C1 preferred stock for an equal number of shares of Series C2 preferred stock and to Ally Bridge MedAlpha of 2,364,509 shares of Series D1 preferred stock in exchange for an equal number of shares of Series D2 preferred stock pursuant to an exchange agreement, in each case, in June 2021; (ii) the automatic conversion of all outstanding shares of Series A1, B1, C1 and D1 redeemable convertible preferred stock into 121,004,726 shares of Class A common stock, (iii) the automatic conversion of all outstanding shares of Series C2 and D2 redeemable convertible preferred stock into 34,516,907 shares of Class B common stock, and (iv) all warrants to purchase redeemable convertible preferred stock becoming warrants to purchase Class A common stock, as if the proposed initial public offering had occurred on the later of January 1, 2020 or the issuance dates of the redeemable convertible preferred stock or preferred stock warrants.

The unaudited pro forma basic and diluted weighted-average common shares outstanding used in the calculation of unaudited pro forma basic and diluted net loss per share attributable to common stockholders for the year ended December 31, 2020 and the three months ended March 31, 2021 have been prepared to give effect, upon a qualified initial public offering, (i) to the automatic conversion of all outstanding shares of Series A1, B1, C1 and D1 redeemable convertible preferred stock into 121,004,726 shares of Class A common stock and (ii) the automatic conversion of all outstanding shares of Series C2 and D2 redeemable convertible preferred stock into 34,516,907 shares of Class B common stock as if the proposed initial public offering had occurred on January 1, 2020.

Unaudited pro forma basic and diluted net loss per share attributable to common stockholders was calculated as follows (in thousands, except share and per share amounts):

	Years Ended December 31, 2020	Three Months Ended March 31, 2021
	(in thousands, except share and per share data)	
Numerator:		
Net loss attributable to common stockholders	$ (45,221)	$ (24,299)
Plus: Change in fair value of preferred stock warrant liability	69	11,448
Plus: Accretion of redeemable convertible preferred stock to redemption value	3,745	787
Plus: Cumulative redeemable convertible preferred stock dividends	4,398	1,411
Pro forma net loss attributable to common stockholders	$ (37,009)	$ (10,653)
Denominator:		
Weighted-average common shares outstanding — basic and diluted	1,793,272	3,207,233
Pro forma adjustment to reflect the automatic conversion of redeemable convertible preferred stock into common stock	133,021,640	155,521,633
Pro forma weighted-average common shares outstanding — basic and diluted	134,814,912	158,728,866
Pro forma net loss per share attributable to common stockholders — basic and diluted	$ (0.27)	$ (0.07)

	As of March 31, 2021		
	Actual	Pro Forma(2)	Pro Forma As Adjusted(3)(4)
	(in thousands)		
Consolidated Balance Sheet Data:			
Cash and cash equivalents	$ 108,635	$ 108,635	$
Working capital(1)	115,384	115,384	
Total assets	138,916	138,916	
Preferred stock warrant liability	15,565	—	
Total liabilities	56,131	40,566	
Redeemable convertible preferred stock	233,832	—	
Additional paid-in capital	112,595	360,437	
Accumulated deficit	(263,689)	(263,689)	
Total stockholders' (deficit) equity	(151,047)	98,350	

(1) We define working capital as current assets less current liabilities. See our consolidated financial statements for further details regarding our current assets and current liabilities.

(2) The unaudited pro forma consolidated balance sheet data gives effect to (i) the automatic conversion of all outstanding shares of our Series A1, B1, C1, and D1 preferred stock into an aggregate of 121,004,726 shares of Class A common stock, (ii) the automatic conversion of all outstanding shares

of our Series C2 and D2 preferred stock into an aggregate of 34,516,907 shares of Class B common stock, and (iii) all warrants to purchase redeemable convertible preferred stock becoming warrants to purchase Class A common stock, which will occur upon the closing of this offering.

(3) Reflects the pro forma adjustments described in footnote (2) and the issuance and sale of shares of Class A common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

(4) Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, total assets, additional paid-in capital and total stockholders' equity (deficit) by $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase (decrease) of 1.0 million shares in the number of shares offered by us at the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) each of cash and cash equivalents, total assets, additional paid-in capital and total stockholders' equity (deficit) by $ million. The pro forma as adjusted information discussed above is illustrative only and will be adjusted based on the actual initial public offering price and other terms of our initial public offering determined at pricing.

Risk factors

You should carefully consider the risks and uncertainties described below and the other information in this prospectus before making an investment in our Class A common stock. Our business, financial condition, results of operations, or prospects could be materially and adversely affected if any of these risks occurs, and as a result, the market price of our Class A common stock could decline and you could lose all or part of your investment. This prospectus also contains forward-looking statements that involve risks and uncertainties. See "Special Note Regarding Forward-Looking Statements." Our actual results could differ materially and adversely from those anticipated in these forward-looking statements as a result of certain factors, including those set forth below.

Risks related to our financial position and need for capital

We have incurred significant losses since inception, we expect to incur losses in the future and we may not be able to generate sufficient revenue to achieve and maintain profitability.

We have incurred significant losses since our inception. For the years ended December 31, 2019 and 2020 and the three months ended March 31, 2021, we incurred net losses of $21.2 million, $37.1 million and $22.1 million, respectively. As of March 31, 2021, we had an accumulated deficit of $263.7 million. We expect that our operating expenses will continue to increase as we grow our business and will also increase as a result of our becoming a public company. Since our inception, we have financed our operations primarily from private placements of our convertible preferred stock, the incurrence of indebtedness, and to a lesser extent, revenue derived from our Growth Direct platform and non-commercial contracts. We have devoted substantially all of our resources to the development and commercialization of our Growth Direct platform and to development activities related to advancing and expanding our technological capabilities. We will need to generate significant additional revenue to achieve and sustain profitability, and even if we achieve profitability, we cannot be sure that we will remain profitable for any substantial period of time. We may never be able to generate sufficient revenue to achieve or sustain profitability and our recent and historical growth should not be considered indicative of our future performance.

Our limited operating history makes it difficult to evaluate our future prospects and the risks and challenges we may encounter.

We were established in 2006 and launched our current second-generation Growth Direct platform in 2017 for which we are continuing to grow our manufacturing and sales and marketing capabilities. Consequently, predictions about our future success or viability may not be as accurate as they could be if we had a longer operating history. While our product and services revenue has increased, if our growth strategy is not successful, we may not be able to continue to grow our revenue or operations. Our limited operating history, evolving business and rapid growth make it difficult to evaluate our future prospects and the risks and challenges we may encounter, and we may not continue to grow at or near historical rates.

In addition, as a business with a limited operating history, we may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown challenges. We are transitioning to a company capable of supporting commercial manufacturing, sales and marketing at scale. We may not be successful in such a transition and, as a result, our business may be adversely affected.

Our success depends on the success of our Growth Direct platform, which may not be achieved or maintained.

Our ability to achieve and maintain commercial market acceptance of our Growth Direct platform will depend on a number of factors, including:

- significant acceptance by drug manufacturers of automated MQC testing;
- our ability to increase awareness of the capabilities of automated MQC testing and our technology and solutions;

- our customers' willingness to adopt new technologies and workflows;
- our ability to integrate our platform with our customers' existing workflows, including related to regulatory validation processes;
- whether our platform reliably provides advantages over the conventional, manual method of MQC testing and other automated technologies and is perceived by customers to be cost effective;
- the continued growth of the pharmaceutical and biopharmaceutical industry, in particular biologics, cell and gene therapies;
- our ability to execute on our business strategy, including continuing to expand in the market for cell and gene therapies;
- the rate of adoption of our platform and solutions by drug manufacturers;
- prices we charge for our systems and consumables;
- the relative reliability and robustness of our platform as a whole and the components of our platform;
- our ability to develop new products for existing customers and to expand our capabilities within the MQC testing workflow;
- our ability to expand the use of our platform with existing customers;
- other competitive automated MQC testing platforms; and
- the impact of our investments in product innovation and commercial growth.

We cannot assure you that we will be successful in addressing each of these criteria or other criteria that might affect the market acceptance of our products. If we are unsuccessful in achieving and maintaining commercial market acceptance of our Growth Direct platform, our business, financial condition, results of operations and prospects could be adversely affected.

Our operating results have fluctuated significantly in the past and will fluctuate significantly in the future, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations.

Our quarterly and annual operating results have fluctuated significantly in the past and may fluctuate significantly in the future, which makes it difficult for us to predict our future operating results. These fluctuations may occur due to a variety of factors, many of which are outside of our control, including, but not limited to:

- our customers' tendency to purchase our Growth Direct system, including multiple systems, in a single transaction, resulting in significant variations in sales of our systems over time;
- the level of demand for our platform and solutions, which may vary significantly;
- the length of time of the sales cycle for purchases of our systems;
- seasonality in our business due to our customers' budgetary cycles and time off during the summer vacation;
- lead time needed for validation prior to our customers' using and purchasing our consumables;
- changes in demand for our consumables;
- the timing and cost of, and level of investment in, technology development and commercialization activities, which may change from time to time;
- the start and completion of manufacturing runs;
- the relative reliability and robustness of our platform;
- the introduction of new products or product enhancements by us or others in our industry;
- expenditures that we may incur to acquire, develop or commercialize additional products and technologies;

- expenditures involved in preparing, filing, prosecuting, maintaining, defending and enforcing patent claims;
- future accounting pronouncements or changes in our accounting policies; and
- general market conditions and other factors, including factors, such as inflation, unrelated to our operating performance or the operating performance of our competitors.

For example, we experienced a decrease in our installation of Growth Direct systems in 2020 due to the shutdown of a number of our customers due to the COVID-19 pandemic. The effect of one of the factors discussed above, or the cumulative effects of a combination of factors discussed above, could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Investors should not rely on our past results as an indication of our future performance.

Our revenue has been primarily generated from sales of our Growth Direct system, proprietary consumables and LIMS connection software, which require a substantial period of time to generate recurring revenue.

Product revenue, comprised of sales of our Growth Direct system, proprietary consumables and LIMS connection software, accounted for 56.5% and 68.4% of our revenue for the years ended December 31, 2019 and 2020, respectively. We expect that sales of these products will continue to account for a substantial portion of our revenue and will increase as we grow our customer base and expand our business with existing customers. The Growth Direct system is fully functional for use by the customer upon delivery, as such we recognize revenue for sales of our Growth Direct system upon transfer of control of the system to the customer. After a system is placed with a customer and installed, validation services start to be provided, which typically can take anywhere from three to nine months. Once a system is validated, we generally expect our customers to transition from the traditional manual method of MQC testing to our automated method and begin regular utilization of consumables over a period of up to three months. Therefore, there can be a period of up to 12 months or more between installation of a system and revenue being generated from the regular sale of consumables for that system. As a result, it can be difficult for us to forecast our product revenue and there may be an extended period of time before we receive recurring revenue from sales of consumables. We may also experience fluctuations in our product revenue, which could have an adverse effect on our financial position.

If we cannot maintain the level of sales of our Growth Direct systems or the sales of our consumables and service contracts to existing customers declines, our future operating results would be adversely affected.

In the years ended December 31, 2019 and 2020, 45.8% of our revenue was generated from two customers and 46.1% of our revenue was generated from three customers, respectively. The revenue generated from these customers was primarily derived from sales of our Growth Direct system. Our customers generally purchase our Growth Direct system at one time and we expect them to use these systems for many years before needing to purchase new systems. Our ability to generate revenue depends on our ability to sell our Growth Direct system to new customers or expand the use of our system by existing customers. As a result, in the near term, we expect a significant portion of our revenue to primarily be generated from a small number of different customers each year. We also rely on consumables and service contracts as a source of recurring revenue from our existing customers. These consumables and service contracts are purchased on an as-needed basis and, as a result, revenue from these sources may be subject to change, as customers' purchasing practices and policies change or their demand for our consumables and service contracts change. If we are unable to sell our Growth Direct system to new customers, if our existing customers don't expand their use of our system, or if our existing customers decide to purchase fewer of our consumables and service contracts or terminate their relationships with us, our revenue could significantly decrease, which would have an adverse effect on our financial condition and results of operations and could adversely impact our ability to execute on our growth strategy.

Repair or replacement costs due to warranties we provide on our Growth Direct system could have a material adverse effect on our business, financial condition and results of operations.

We provide a one-year limited assurance warranty on Growth Direct systems, which is included in the sales price. Existing and future warranties place us at the risk of incurring future repair or replacement costs. We establish

our accrual for estimated warranty expenses based on historical information, current cost data and future forecasts. We exercise judgment in determining the expected product warranty costs, using estimated material, labor and other costs. While we believe that historical experience provides a reliable basis for estimating such warranty cost, unforeseen quality issues or component failure rates could result in future costs in excess of such estimates. As of March 31, 2021, we had an amount reserved for warranty costs of $0.6 million. Substantial amounts of warranty claims could have a material adverse effect on our business, financial condition and results of operations.

We may need to raise additional capital to fund our existing operations, improve our platform or develop and commercialize new products or expand our operations.

We expect to spend significant amounts to expand our existing operations, to continue to improve our Growth Direct platform and to develop new products and consumables. Based upon our current operating plan, we believe that the net proceeds from this offering and our existing cash and cash equivalents, and anticipated cash flow from operations, will enable us to fund our operating expenses and capital expenditure requirements . This estimate and our expectation regarding the sufficiency of the net proceeds from this offering are based on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect. Until such time, if ever, as we can generate sufficient revenues, we may finance our cash needs through a combination of equity offerings and debt financings or other sources. We do not currently have any committed external source of funds. In addition, we may seek additional capital due to favorable market conditions or strategic considerations, even if we believe that we have sufficient funds for our current or future operating plans.

Our present and future funding requirements will depend on many factors, including:

- our ability to achieve revenue growth;
- the cost of expanding our operations, including our manufacturing facilities, and our offerings, including our sales and marketing efforts;
- our rate of progress in launching and commercializing new products, and the cost of the sales and marketing activities associated with, establishing adoption of our Growth Direct system;
- our rate of progress in, and cost of research and development activities associated with, products in research and development;
- the effect of competing technological and market developments;
- the costs involved in preparing, filing, prosecuting, maintaining, defending and enforcing patent claims; and
- costs related to domestic and international expansion.

To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. In addition, debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may be required to relinquish valuable rights to our technologies, intellectual property, future revenue streams or products or grant licenses on terms that may not be favorable to us. Furthermore, any capital raising efforts may divert our management from their day-to-day activities, which may adversely affect our ability to advance product development activities. If we are unable to raise additional funds when needed, we may be required to delay, limit, reduce or terminate product development or commercialization efforts.

Risks related to our business and strategy

The COVID-19 pandemic has impacted, and may continue to impact, our operations and may materially and adversely affect our business and financial results.

Since late 2019, the COVID-19 pandemic has spread globally, including to the Boston, Massachusetts area, where our primary office and manufacturing facility is located. The COVID-19 pandemic is evolving, and has led

to the implementation of various responses, including government-imposed, shelter-in-place orders, quarantines, travel restrictions and other public health safety measures. In response to the spread of COVID-19, and in accordance with direction from state and local government authorities, we have restricted access to our facilities mostly to personnel and third parties who must perform critical activities that must be completed on-site, limited the number of such personnel that can be present at our facilities at any one time, and requested that most of our personnel work remotely. While Massachusetts is engaged in a phased re-opening of businesses, in the event that government authorities were to halt the re-opening or modify current restrictions, our employees conducting development or manufacturing activities may not be able to access our manufacturing space, and our core activities may be significantly limited or curtailed, possibly for an extended period of time.

As a result of the COVID-19 outbreak, we have and may in the future experience severe disruptions, including:

- interruption of or delays in receiving products and supplies from the third parties we rely on to, among other things, manufacture components for our Growth Direct system and consumables, due to staffing shortages, production slowdowns or stoppages and disruptions in delivery systems, which may impair our ability to sell our products;
- limitations on our business operations by local, state, or the federal government that could impact our ability to sell our products;
- on-site visit limitations and prohibitions imposed by customers that could impact our ability to engage in pre-sales activities, such as in-person meetings and site visits, and to provide post-sale activities, such as installation and verification, training and service and support;
- delays in customers' purchasing decisions and negotiations with customers and potential customers;
- business disruptions caused by workplace, laboratory and office closures and an increased reliance on employees working from home, travel limitations, cyber security and data accessibility, or communication or mass transit disruptions; and
- limitations on employee resources that would otherwise be focused on the conduct of our activities, including because of sickness of employees or their families or the desire of employees to avoid contact with large groups of people.

Any of these factors could severely impact our development activities, business operations and sales, or delay necessary interactions with manufacturing sites and other important contractors and customers. For example, we experienced a disruption in receiving supplies from third parties and a decrease in installations as a result of the shutdown of our customers' businesses. These and other factors arising from the COVID-19 pandemic could worsen in countries that are already afflicted with COVID-19, could continue to spread to additional countries, or could return to countries where the pandemic has been partially contained, and could further adversely impact our ability to conduct our business generally and have a material adverse impact on our operations and financial condition and results.

The extent to which the outbreak may negatively impact our operations and results of operations or those of our third party manufacturers, suppliers, collaborators or customers will depend on future developments, which are highly uncertain and cannot be predicted with confidence, such as the ultimate geographic spread of the disease, the duration of the outbreak, travel restrictions, additional or modified government actions, new information that emerges concerning the severity and impact of COVID-19 and actions to contain the outbreak or treat its impact, such as social distancing, quarantines, lock-downs or business closures.

The continued success of our business relies heavily on establishing and maintaining our position in the market as a leading provider of automated MQC testing.

Our future profitability will depend on our ability to successfully execute and maintain a sustainable business model and generate continuous streams of revenue. Our business model is premised on the fact that we are and will continue to be a leader in automated MQC testing and the competitive advantages our position creates. Our Growth Direct platform, among other things, is designed to reduce the amount of time for MQC testing and the

opportunity for human error in what we believe is a more cost-effective manner than traditional MQC testing. However, if competitors develop and commercialize an automated MQC testing platform that is comparable to ours and are able to obtain traction with customers, we may not be able to maintain our lead position and execute our business strategy, which could adversely affect our financial position and prospects. If we are unable to expand or continue to expand our customers in new areas of drug manufacturing, such as cell and gene therapies, continue to grow market adoption of our Growth Direct platform, and maintain our position as the industry leader in automated MQC testing, our business, prospects, financial condition and results of operation could be adversely affected.

It may be difficult for us to implement our strategies for improving growth.

Our success will depend on our ability to expand our business with existing customers and to target new drug manufacturing customers to capture a greater share of the MQC testing value chain. Our ability to grow our business with existing customers will depend on our ability to broaden the application of our automated MQC testing to a larger portion of the MQC testing workflow and to increase the number of Growth Direct systems in their manufacturing facilities. Our ability to expand our business will also depend on our ability to attract new customers and to integrate our platform with new methods of manufacturing, such as cell and gene therapies. Future revenue growth will also depend on our ability to develop and market new products, technologies and solutions to meet our customers' evolving needs, as well as our ability to identify new applications and customers for our technology in additional industries beyond the drug manufacturing industry.

As we continue to scale our business, we may find that certain of our products, certain customers or certain industries may require a dedicated sales force or sales personnel with different experience than those we currently employ. Identifying, recruiting and training additional qualified personnel would require significant time, expense and attention. If we are unable to drive new customer conversion to automated MQC and our Growth Direct platform, expand adoption of our Growth Direct platform into new industries and markets, or increase the usage and value of our platform to our customers, then our business, financial condition, results of operations and prospects could be adversely affected.

We may not successfully implement our strategy to expand our Growth Direct platform to customers who manufacture cell and gene therapies.

Our ability to execute our growth strategy to expand our Growth Direct platform to customers who manufacture cell and gene therapies depends upon our ability to integrate our platform with the novel manufacturing processes being developed for these therapies. Companies that manufacture cell and gene therapies are developing new approaches to handle this manufacturing method, including novel facility layouts, new processes and workflows, and new quality and risk management frameworks. Unlike traditional "small molecule" drug manufacturing, the manufacture of biologics, such as cell and gene therapies, is more time sensitive and subject to increased risk of contamination due to material handling and process change-over. There are also currently a small number of cell and gene therapies approved by the FDA. While we have experience providing automated MQC testing for customers that manufacture a number of these approved therapies, we may encounter challenges or unexpected issues as we apply our Growth Direct platform to testing a greater number of therapies as they are approved in future. We cannot be certain that we will be able to successfully or consistently integrate our platform with this novel manufacturing process. If we are unable to successfully expand our Growth Direct platform into this growing segment of therapeutic manufacturing, our business and financial position may be adversely affected.

The size of the markets and forecasts of market growth for automated MQC testing and other of our key performance indicators are based on a number of complex assumptions and estimates, and may be inaccurate.

We estimate annual total addressable markets and forecasts of market growth for our Growth Direct platform. We have also developed a standard set of key performance indicators in order to enable us to assess the performance of our business in and across multiple markets, and to forecast future revenue. These estimates, forecasts and key performance indicators are based on a number of complex assumptions, internal and third-party estimates and market studies, and other business data, including assumptions and estimates relating to our

ability to generate revenue from the expansion of our platform into new drug manufacturing areas and new industries. While we believe our assumptions and the data underlying our estimates and key performance indicators are reasonable, there are inherent challenges in measuring or forecasting such information. As a result, these assumptions and estimates may not be correct and the conditions supporting our assumptions or estimates may change at any time, thereby reducing the predictive accuracy of these underlying factors and indicators. As a result, our estimates of the total addressable market and our forecasts of market growth for our current or future products may prove to be incorrect, and our key performance indicators may not reflect our actual performance. If the total addressable market or the potential market growth for our platform is smaller than we have estimated or if the key performance indicators we utilize to forecast revenue are inaccurate, it may impair our sales growth and have an adverse impact on our business, financial condition, results of operations and prospects.

New product development involves a lengthy and complex process and we may be unable to develop or commercialize products on a timely basis, or at all.

Products from our development programs will take time and considerable resources to develop, and may include improvements or changes to our systems, software and consumables. We may not be able to complete development and commercialize them on a timely basis, or at all. There can be no assurance that our development programs will produce commercial products and solutions and before we can commercialize any new products, we will need to expend significant funds in order to:

- conduct substantial research and development, which may include validation studies;
- further develop and scale our engineering and manufacturing processes to accommodate different products;
- further develop and scale our infrastructure to be able to analyze increasingly large amounts of data; and
- utilize data and analytical insights generated from existing Growth Direct platform in our research and development programs in order to advance these programs.

Our product development processes involve a high degree of risk, and these efforts may be delayed or fail for many reasons, including:

- failure of the product to perform as expected;
- higher costs than anticipated; and
- failure to reliably demonstrate the advantages of our products.

In addition, if we are unable to generate additional data and insights from our existing Growth Direct platforms, then we may not be able to advance these programs as quickly, or at all, or without significant additional investment, all of which could have a material adverse effect on our product development efforts.

Even if we are successful in developing new products, it will require us to make significant additional investments in marketing and selling resources in order to commercialize any such products. As a result, we may be unsuccessful in commercializing new products that we develop, which could adversely affect our business, financial condition, results of operations and prospects.

Our customers use our Growth Direct platform as part of their quality-control workflow, which is subject to regulation by the FDA and other comparable regulatory authorities.

We provide products and services used for quality-control testing in pharmaceutical product manufacturing. Our customers are subject to extensive regulations by the FDA and similar regulatory authorities in other countries, including, for example, cGMP regulations and associated requirements to validate the methods used to manufacture their products. To meet their regulatory compliance requirements, our customers have implemented quality-control workflows to monitor for microbial growth and contamination. While our Growth Direct platform is not regulated directly by the FDA or other comparable authorities and we have not verified our Growth Direct platform for compliance with such regulations, we have designed our platform to be integrated as part of a compliant quality-control workflow. If our Growth Direct platform is unable to meet regulatory standards for

compliance or we are unable to update our platform to meet new regulatory requirements, we will lose customers and our business will be adversely affected. While under our agreements with our customers we are not liable for non-compliance of our Growth Direct platform, if a customer experienced a compliance failure due to our Growth Direct platform, our reputation could be harmed and our business prospects adversely affected.

If we are unable to support demand for the Growth Direct platform, and for our future product offerings, including ensuring that we have adequate capacity to meet increased demand, our business could suffer.

As the number of customers using the Growth Direct platform grows and our volume of installed systems increases, we will need to continue to increase our capacity for customer service and support, including maintenance services of our systems, and expand our manufacturing capabilities. As a result, we will also need to purchase additional equipment, some of which can take several months or more to procure, setup and validate, and increase our personnel levels to meet increased demand. There is no assurance that any of these increases in scale, expansion of personnel, equipment, manufacturing or services will be successfully implemented, or that we will have adequate space, including in our manufacturing facility, to accommodate such required expansion.

As we commercialize additional products, we will need to incorporate new equipment, implement new technology systems and processes, and hire new personnel, possibly with supplemental or different qualifications as compared to our current personnel. Failure to manage this growth or transition could result in product delays, higher cost of product revenue, declining product quality, deteriorating customer service and slower responses to competitive challenges. A failure in any one of these areas could make it difficult for us to meet market expectations for our products and could damage our reputation and the prospects for our business.

We have limited experience in marketing and sales, and if we are unable to expand our marketing and sales organization to adequately address our customers' needs or to expand our customer base, our business may be adversely affected.

We have limited experience in marketing and selling our products and we currently rely on a small team to make direct sales in countries around the world. In order to support our planned growth, we will need to rapidly increase our sales and marketing team. Competition for employees capable of selling expensive instruments within the drug manufacturing industry is intense. There are significant expenses and risks involved with having our own sales and marketing team, including our ability to hire, train, retain, and appropriately incentivize a sufficient number of qualified individuals, generate sufficient sales leads and provide our sales and marketing team with adequate access to customers who may want to purchase our products, effectively manage a geographically dispersed sales and marketing team, and other unforeseen costs and expenses. We may not be able to attract and retain personnel or be able to build an efficient and effective sales organization, which could negatively impact sales and market acceptance of our products and limit our revenue growth and potential profitability. In addition, the time and cost of establishing a specialized sales, marketing and service force for a particular product or service may be difficult to justify in light of the revenue generated or projected.

We may also choose to engage distributors for the sale of our products. We would exert limited control over these distributors, and if their sales and marketing efforts for our products are not successful, our business would be materially and adversely affected. We may not be successful in locating, qualifying and engaging distributors with local industry experience and knowledge, or we may not be able to enter into arrangements with them on favorable terms. Even if we are successful in identifying distributors, such distributors may engage in sales practices that violate local laws or our internal policies. Furthermore, sales practices utilized by any such distributors that are locally acceptable may not comply with sales practices standards required under U.S. laws that apply to us, which could create additional compliance risk.

We may be unable to manage our future growth effectively, which could make it difficult to execute our business strategy.

We have experienced rapid growth in our product and service revenue and anticipate further growth in our business operations. Our growth has required significant time and attention from our management, and placed strains on our operational and manufacturing systems and processes, financial systems and internal controls and

other aspects of our business. We expect to continue to increase headcount and to hire more specialized personnel in the future as we grow our business. We will need to continue to hire, train and manage additional qualified engineers, client and account services personnel and sales and marketing staff and improve and maintain our technology to properly manage our growth. We may also need to hire, train and manage individuals with expertise that is separate, supplemental or different from expertise that we currently have, and accordingly we may not be successful in hiring, training and managing such individuals. If our new hires perform poorly, if we are unsuccessful in hiring, training, managing and integrating these new employees, or if we are not successful in retaining our existing employees, our business may be harmed.

Developing and launching new products and innovating and improving our existing products have required us to hire and retain additional engineering, sales and marketing, software, manufacturing, distribution and quality assurance personnel. As a result, we have experienced rapid headcount growth. As we have grown, our employees have become more geographically dispersed. We serve customers located in multiple countries and plan to continue to expand to new countries as part of our growth strategy, which will lead to increased dispersion of our employees, including sales employees and employees who are in our service and support groups. Moreover, we expect that we will need to hire additional accounting, finance, legal and other personnel in connection with our becoming, and our efforts to comply with the requirements of being, a public company. Once public, our management and other personnel will need to devote a substantial amount of time towards maintaining compliance with these requirements. We may face challenges integrating, developing and motivating our rapidly growing and increasingly dispersed employee base.

We may not be able to maintain the quality, reliability or robustness of our platform, or the expected turnaround times of our services and support, or to satisfy customer demand as it grows. Our ability to manage our growth properly will require us to continue to improve our operational, financial and management controls, as well as our reporting systems and procedures. To effectively manage our growth, we must continue to improve our operational and manufacturing systems and processes, our financial systems and internal controls and other aspects of our business and continue to effectively expand, train and manage our personnel. The time and resources required to improve our existing systems and procedures, implement new systems and procedures and to adequately staff such existing and new systems and procedures is uncertain, and failure to complete such activities in a timely and efficient manner could adversely affect our operations and negatively impact our business and financial results.

If we cannot compete successfully, we may be unable to increase or sustain our revenue, or achieve and sustain profitability.

We currently primarily compete with established companies that provide consumables for MQC testing and with a limited number of established and early-stage companies that have automated MQC testing systems. In addition, our customers may also elect to continue to use the traditional MQC testing method rather than our platform and may decide to stop using our platform.

Our competitors and potential competitors may enjoy a number of competitive advantages over us, including:

- longer operating histories;
- larger customer bases;
- greater brand recognition and market penetration;
- greater financial resources;
- greater technological and research and development resources;
- better system reliability and robustness;
- greater selling and marketing capabilities; and
- better established, larger scale and lower cost manufacturing capabilities.

As a result, our competitors and potential competitors may be able to respond more quickly to changes in customer requirements, devote greater resources to the development, promotion and sale of their platforms or instruments than we can or sell their platforms or instruments, or offer services competitive with our platform and services at prices designed to win significant levels of market share. We may not be able to compete effectively against these organizations.

In addition, competitors may be acquired by, receive investments from or enter into other commercial relationships with larger, well-established and well-financed companies. Certain of our competitors may be able to secure key inputs from vendors on more favorable terms, devote greater resources to marketing and promotional campaigns, adopt more aggressive pricing policies and devote substantially more resources to product development than we can. Further, competition in the automated MQC testing market, while currently limited, may increase in future, and we may not be able to maintain our leading position in the industry as a result. If we are unable to compete successfully, we may be unable to increase market adoption and sales of our platform, which could prevent us from increasing our revenue or achieving profitability.

We must develop new products, adapt to rapid and significant technological change and respond to introductions of new products by competitors to remain competitive.

We sell our products in industries that are characterized by significant enhancements and evolving industry standards. As a result, our customers' needs are rapidly evolving. If we do not appropriately innovate and invest in new technologies, our products and services may become less desirable in the markets we serve, and our customers could move to new technologies offered by our competitors or decide to revert to the traditional MQC testing method. Though we believe customers in our markets display a significant amount of loyalty to their supplier of a particular product, we also believe that because of the initial time investment required by many of our customers to reach a purchasing decision for a new product, it may be difficult to regain that customer once the customer purchases a product from a competitor. Without the timely introduction of new products, services and enhancements, our offerings will likely become less competitive over time, in which case our competitive position and operating results could suffer. Accordingly, we focus significant efforts and resources on the development and identification of new technologies, products and markets to further broaden our offerings. To the extent we fail to timely introduce new and innovative products or services, adequately predict our customers' needs or fail to obtain desired levels of market acceptance, our business may suffer and our operating results could be adversely affected.

Due to the significant resources required to enable access in new markets, we must make strategic and operational decisions to prioritize certain markets, products and services. We may expend our resources to access markets and develop products and services that do not yield meaningful revenue or we may fail to capitalize on markets, products or services that may be more profitable or with a greater potential for success.

We believe our platform has potential applications across a wide range of markets and we have targeted certain markets in which we believe our technology has significant advantages or a higher probability of success or greater revenue opportunity, such as the manufacture of cell and gene therapies. We seek to maintain a process of prioritization and resource allocation among our programs to maintain a balance between advancing near-term opportunities and exploring additional markets for our platform. However, due to the significant resources required for the development of products and services for new markets, we must make decisions on which markets to pursue and the amount of resources to allocate to each. Our decisions concerning the allocation of research, development, collaboration, management and financial resources toward particular markets, products or services may not lead to the development of any viable product or service and may divert resources away from better opportunities. Similarly, we may choose to pursue certain markets, which may not be as profitable as other markets that we did not pursue due to our limited resources. As a result, our business, financial condition, results of operations and prospects could be adversely impacted.

The Growth Direct platform may contain undetected errors or defects and may not meet the expectations of our customers, which means our business, financial condition, results of operations and prospects could suffer.

Our Growth Direct platform includes the Growth Direct system, proprietary consumables and our LIMS connection software. While we rigorously test our platform and its components, there could be undetected errors or

defects. Disruptions or other performance problems with our platform or with the components that comprise our platform may adversely impact our customers' manufacturing process, compliance work flow or business, harm our reputation and result in reduced revenue or increased costs associated with repairs or replacements. If that occurs, we may also incur significant costs, the attention of our key personnel could be diverted or other significant customer relations problems may arise. We may also be subject to warranty claims or breach of contract for damages related to errors or defects in our products. Additionally, we may be subject to legal claims arising from any defects or errors in our platform, and in the systems, consumables and software that comprise our platform.

Our success depends on, among other things, the market's confidence that the Growth Direct platform is capable of substantially enhancing quality control in the conduct of manufacturing activities as compared to the traditional method of MQC testing, and will enable more efficient or improved drug manufacturing. Pharmaceutical companies and contract manufacturing organizations, or CMOs, are likely to be particularly sensitive to defects and errors in the use of our platform, including if our platform fails to deliver meaningful improvements in MQC testing with results at least as good as the results generated using the traditional method of MQC testing. There can be no guarantee that our platform will meet the expectations of these companies or CMOs.

The complexity of our products and the amount of lead time required to deliver products to our customers have caused in the past, and may cause in the future, delays in releasing new products and workflows. In addition, we have experienced in the past, and may experience in the future, challenges with respect to the reliability of our systems. If there are delays in delivering our products to our customers, or if our products fail to perform as well as or better than traditional MQC testing or fail to generate reliable results for our customers, our revenue could be reduced or delayed, which could adversely affect our business, financial condition, results of operations and prospects.

These complexities also require that we train our customers to operate our Growth Direct platform, which is expensive and time consuming. Any misuse of our products, including as a result of inadequate training, could cause our products not to perform as expected or to fail to demonstrate the process advantages of our products. The training requirement may also deter some customers from utilizing our products. Any of these results could adversely affect our business, financial condition, results of operations and prospects.

Potential product liability lawsuits against us could cause us to incur substantial liabilities and limit commercialization of any products that we may develop.

The use of any product we may develop and the sale of any products exposes us to the risk of product liability claims. Product liability claims might be brought against us by pharmaceutical companies, CMOs or others selling or otherwise coming into contact with our products. If we cannot successfully defend against product liability claims, we could incur substantial liability and costs. In addition, regardless of merit or eventual outcome, product liability claims may result in:

- impairment of our business reputation and significant negative media attention;
- withdrawal of customers;
- significant costs to defend the litigation;
- distraction of management's attention from our primary business;
- substantial monetary awards to claimants;
- inability to commercialize a product;
- product recalls or withdrawals;
- decreased market demand for any product; and
- loss of revenue.

The product liability insurance we currently carry, and any additional product liability insurance coverage we acquire in the future, may not be sufficient to reimburse us for any expenses or losses we may suffer. Moreover, insurance coverage is becoming increasingly expensive and, in the future, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. A successful product liability claim, or series of claims, brought against us could cause our share price to decline and, if judgments exceed our insurance coverage, could adversely affect our results of operation and business, including preventing or limiting the commercialization of any products we develop.

We depend on our information technology systems, and any failure of these systems could harm our business.

We depend on information technology and telecommunications systems for significant elements of our operations, including our knowledge management system, our customer reporting, our platform, advanced automation systems, and advanced application and LIMS connection software. We have installed, and expect to expand, a number of enterprise software systems that affect a broad range of business processes and functional areas, including for example, systems handling human resources, financial controls and reporting, contract management, compliance and other infrastructure operations. These implementations can be expensive and require significant time and effort. These information technology and telecommunications systems support a variety of functions, including manufacturing operations, data analysis, quality control, customer service and support, billing, research and development activities, and general administrative activities.

Information technology and telecommunications systems are vulnerable to damage from a variety of sources, including telecommunications or network failures, malicious software, bugs or viruses, human acts and natural disasters. Moreover, despite network security and back-up measures, some of our servers are potentially vulnerable to physical or electronic break-ins, computer viruses and similar disruptive problems. Any disruption or loss of information technology or telecommunications systems on which critical aspects of our operations depend could have an adverse effect on our business and our reputation.

Security breaches, loss of data and other disruptions could compromise sensitive information related to our business or prevent us from accessing critical information and expose us to liability, which could adversely affect our business and our reputation.

In the ordinary course of our business, we collect and store sensitive data, including personally identifiable information, intellectual property and proprietary business information owned or controlled by ourselves or our employees, customers and other parties. We manage and maintain our applications and data utilizing a combination of on-site systems and cloud-based data centers. We utilize external security and infrastructure vendors to manage parts of our data centers. These applications and data encompass a wide variety of business-critical information, including research and development information, customer information, commercial information and business and financial information. We face a number of risks relative to protecting this critical information, including loss of access risk, inappropriate use or disclosure, unauthorized access, inappropriate modification and the risk of our being unable to adequately monitor and audit and modify our controls over our critical information. This risk extends to the third-party vendors and subcontractors we use to manage this sensitive data or otherwise process it on our behalf. The secure processing, storage, maintenance and transmission of this critical information are vital to our operations and business strategy, and we devote significant resources to protecting such information. Although we take reasonable measures to protect sensitive data from unauthorized access, use or disclosure, our information technology and infrastructure may still be vulnerable to, and we have in the past experienced, attacks by hackers or viruses or breaches due to employee error, malfeasance or other malicious or inadvertent disruptions. Further, attacks upon information technology systems are increasing in their frequency, levels of persistence, sophistication and intensity, and are being conducted by sophisticated and organized groups and individuals with a wide range of motives and expertise. As a result of the COVID-19 pandemic, we may also face increased cybersecurity risks due to our reliance on internet technology and the number of our employees who are working remotely, which may create additional opportunities for cybercriminals to exploit vulnerabilities. Furthermore, because the techniques used to obtain unauthorized access to, or to sabotage, systems change frequently and often are not recognized until launched against a target, we may be unable to anticipate these techniques or implement adequate preventative measures. We may also experience security breaches that

may remain undetected for an extended period. Any such breach or interruption could compromise our networks and the information stored there could be accessed by unauthorized parties, publicly disclosed, lost or stolen. Any such access, breach, or other loss of information could result in legal claims or proceedings, and liability under federal or state laws that protect the privacy of personal information, and regulatory penalties. Notice of breaches may be required to affected individuals or other state, federal or foreign regulators, and for extensive breaches, notice may need to be made to the media or State Attorneys General. Such a notice could harm our reputation and our ability to compete. Although we have implemented security measures to prevent unauthorized access, such data is currently accessible through multiple channels, and there is no guarantee we can protect our data from breach. Unauthorized access, loss or dissemination could also disrupt our operations and damage our reputation, any of which could adversely affect our business.

We are currently subject to, and may in the future become subject to additional, U.S., state and foreign laws and regulations imposing obligations on how we collect, store and process personal information. Our actual or perceived failure to comply with such obligations could harm our business. Ensuring compliance with such laws could also impair our efforts to maintain and expand our customer base, and thereby decrease our revenue.

We are, and may increasingly become, subject to various laws and regulations, as well as contractual obligations, relating to data privacy and security in the jurisdictions in which we operate. The regulatory environment related to data privacy and security is increasingly rigorous, with new and constantly changing requirements applicable to our business, and enforcement practices are likely to remain uncertain for the foreseeable future. These laws and regulations may be interpreted and applied differently over time and from jurisdiction to jurisdiction, and it is possible that they will be interpreted and applied in ways that may have a material adverse effect on our business, financial condition, results of operations and prospects.

In the United States, various federal and state regulators, including governmental agencies like the Consumer Financial Protection Bureau and the Federal Trade Commission, have adopted, or are considering adopting, laws and regulations concerning personal information and data security. Certain state laws may be more stringent or broader in scope, or offer greater individual rights, with respect to personal information than federal, international or other state laws, and such laws may differ from each other, all of which may complicate compliance efforts. For example, the California Consumer Privacy Act, or CCPA, which increases privacy rights for California residents and imposes obligations on companies that process their personal information, came into effect on January 1, 2020. Among other things, the CCPA requires covered companies to provide new disclosures to California consumers and provide such consumers new data protection and privacy rights, including the ability to opt-out of certain sales of personal information. The CCPA provides for civil penalties for violations, as well as a private right of action for certain data breaches that result in the loss of personal information. This private right of action may increase the likelihood of, and risks associated with, data breach litigation. In addition, laws in all 50 U.S. states require businesses to provide notice to consumers whose personal information has been disclosed as a result of a data breach. State laws are changing rapidly and there is discussion in the U.S. Congress of a new comprehensive federal data privacy law to which we would become subject if it is enacted.

Internationally, laws, regulations and standards in many jurisdictions apply broadly to the collection, use, retention, security, disclosure, transfer and other processing of personal information. For example, the EU General Data Protection Regulation, or GDPR, which became effective in May 2018, greatly increased the European Commission's jurisdictional reach of its laws and adds a broad array of requirements for handling personal data. EU and the European Economic Area, or EEA, member states are tasked under the GDPR to enact, and have enacted, certain implementing legislation that adds to and/or further interprets the GDPR requirements and potentially extends our obligations and potential liability for failing to meet such obligations. The GDPR, together with national legislation, regulations and guidelines of the EU and EEA member states governing the processing of personal data, impose strict obligations and restrictions on the ability to collect, use, retain, protect, disclose, transfer and otherwise process personal data. In particular, the GDPR includes obligations and restrictions concerning the consent and rights of individuals to whom the personal data relates, the transfer of personal data out of the European Economic Area, security breach notifications and the security and confidentiality of personal data. The GDPR authorizes fines for certain violations of up to 4% of global annual revenue or €20 million, whichever is greater. Among other requirements, the GDPR regulates transfers of personal data subject to the GDPR to third

countries that have not been found to provide adequate protection to such personal data, including the United States, and the efficacy and longevity of current transfer mechanisms between the EU and the United States remains uncertain. For example, in 2016, the EU and United States agreed to a transfer framework for data transferred from the EU to the United States, called the Privacy Shield, but the Privacy Shield was invalidated in July 2020 by the Court of Justice of the European Union. Further, from January 1, 2021, companies have to comply with the GDPR and also the United Kingdom GDPR, or the UK GDPR, which, together with the amended UK Data Protection Act 2018, retains the GDPR in UK national law. The UK GDPR mirrors the fines under the GDPR, i.e., fines up to the greater of €20 million (£17.5 million) or 4% of global turnover. The relationship between the United Kingdom and the European Union in relation to certain aspects of data protection law remains unclear, and it is unclear how United Kingdom data protection laws and regulations will develop in the medium to longer term, and how data transfers to and from the United Kingdom will be regulated in the long term. These changes will lead to additional costs and increase our overall risk exposure. Currently there is a four to six-month grace period agreed in the EU and United Kingdom Trade and Cooperation Agreement, ending June 30, 2021 at the latest, whilst the parties discuss an adequacy decision. The European Commission published a draft adequacy decision on February 19, 2021. If adopted, the decision will enable data transfers from EU member states to the United Kingdom for a four-year period, subject to subsequent extensions.

All of these evolving compliance and operational requirements impose significant costs, such as costs related to organizational changes, implementing additional protection technologies, training employees and engaging consultants, which are likely to increase over time. In addition, such requirements may require us to modify our data processing practices and policies, distract management or divert resources from other initiatives and projects, all of which could have a material adverse effect on our business, financial condition, results of operations and prospects. Any failure or perceived failure by us to comply with any applicable federal, state or similar foreign laws and regulations relating to data privacy and security could result in damage to our reputation, as well as proceedings or litigation by governmental agencies or other third parties, including class action privacy litigation in certain jurisdictions, which would subject us to significant fines, sanctions, awards, penalties or judgments, all of which could have a material adverse effect on our business, financial condition, results of operations and prospects.

If we lose key management, cannot recruit qualified employees, directors, officers or other significant personnel or experience increases in our compensation costs, our business may be materially harmed.

We are highly dependent on our management and directors, including our Chief Executive Officer, Robert Spignesi, among others. Due to the specialized knowledge each of our officers and key employees possesses with respect to our products and services and our operations, the loss of service of any of our officers or directors could delay or prevent the successful sales and expansion of our platform. We do not carry key person life insurance on our Chief Executive Officer or our other officers or directors. In general, the employment arrangements that we have with our executive officers do not prevent them from terminating their employment with us at any time.

In addition, our future success and growth will depend in part on the continued service of our directors, employees and management personnel and our ability to identify, hire and retain additional personnel. If we lose one or more of our executive officers or key employees, our ability to implement our business strategy successfully could be seriously harmed. Furthermore, replacing executive officers and key employees may be difficult or costly and may take an extended period of time because of the limited number of individuals in our industry with the breadth of skills and experience required to develop, market and sell our products successfully. Competition to hire from this limited pool is intense, and we may be unable to hire, train, retain or effectively incentivize these additional key personnel on acceptable terms given the competition among numerous technology companies for similar personnel. In addition, we rely on consultants and advisors to assist us in formulating our development and commercialization strategy. Our consultants and advisors may be engaged by entities other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us. If we are unable to continue to attract and retain qualified personnel, our ability to develop and commercialize products will be limited.

We may acquire businesses or form joint ventures or make investments in other companies or technologies that could negatively affect our operating results, dilute our stockholders' ownership, increase our debt or cause us to incur significant expense.

We may pursue acquisitions of businesses and assets. We also may pursue strategic alliances and joint ventures that leverage our technology and industry experience to expand our offerings or distribution. We have no experience with acquiring other companies and limited experience with forming strategic partnerships. We may not be able to find suitable collaborators or acquisition candidates, and we may not be able to complete such transactions on favorable terms, if at all. The competition for collaborators or acquisition candidates may be intense, and the negotiation process will be time consuming and complex. If we make any acquisitions, we may not be able to integrate these acquisitions successfully into our existing business, these acquisitions may not strengthen our competitive position, the transactions may be viewed negatively by customers or investors, we may be unable to retain key employees of any acquired business, relationships with key suppliers, manufacturers or customers of any acquired business may be impaired due to changes in management and ownership, and we could assume unknown or contingent liabilities. Any future acquisitions also could result in the incurrence of debt, contingent liabilities or future write-offs of intangible assets or goodwill, any of which could have a material adverse effect on our business, financial condition, results of operations and prospects. We cannot guarantee that we will be able to fully recover the costs of any acquisition. Integration of an acquired company also may disrupt ongoing operations and require management resources that we would otherwise focus on developing our existing business. We may not realize the anticipated benefits of any acquisition, technology license, strategic alliance or joint venture. We also may experience losses related to investments in other companies, which could have a material adverse effect on our business, financial condition, results of operations and prospects.

To finance any acquisitions or joint ventures, we may choose to issue shares of our common stock as consideration, which would dilute the ownership of our stockholders. Additional funds may not be available on terms that are favorable to us, or at all. If the price of our Class A common stock is low or volatile, we may not be able to acquire companies or fund a joint venture project using our stock as consideration.

Our insurance policies are expensive and protect us only from some business risks, which leaves us exposed to significant uninsured liabilities.

We do not carry insurance for all categories of risk that our business may encounter and our policies have limits and significant deductibles. Some of the policies we currently maintain include general liability, property, umbrella and directors' and officers' insurance.

Any additional product liability insurance coverage we acquire in the future, may not be sufficient to reimburse us for any expenses or losses we may suffer. Moreover, insurance coverage is becoming increasingly expensive and in the future we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses. A successful product liability claim or series of claims in which judgments exceed our insurance coverage could adversely affect our business, financial condition, results of operations and prospects, including preventing or limiting the commercialization of any products we develop.

We also expect that operating as a public company will make it more difficult and more expensive for us to obtain director and officer liability insurance, and we may be required to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. As a result, it may be more difficult for us to attract and retain qualified people to serve on our board of directors, our board committees or as executive officers. We do not know, however, if we will be able to maintain existing insurance with adequate levels of coverage. Any significant uninsured liability may require us to pay substantial amounts, which would adversely affect our business, financial condition, results of operations and prospects.

Our loan and security agreement contains covenants, which restrict our operating activities, and we may be required to repay the outstanding indebtedness in an event of default, which could have a material adverse effect on our business, financial condition, results of operations and prospects.

In May 2020, we entered into a loan and security agreement with Kennedy Lewis Management LP, or the Lender, pursuant to which the Lender agreed to provide us certain term loans up to an aggregate principal amount of

$60.0 million of which we've borrowed $25.0 million. Until we have repaid such indebtedness, the loan and security agreement subjects us to various customary covenants, including requirements as to financial reporting, minimum liquidity and insurance and restrictions on our ability to dispose of our business or property, to change our line of business, to merge or consolidate with any other entity or to acquire all or substantially all of the capital stock or property of another entity, to incur additional indebtedness, to incur liens on our property, to pay any dividends or make other distributions on capital stock other than dividends payable solely in capital stock, to redeem capital stock, to make investments other than certain permitted investments, to engage in transactions with affiliates, to make payments on subordinated debt, to fail to comply with certain compliance requirements, and to amend our operating documents without the Lender's prior written consent. Our business may be adversely affected by these restrictions on our ability to operate our business.

We may be required to repay the outstanding indebtedness under the loan facility if an event of default occurs under the loan and security agreement. An event of default will occur if, among other things, we fail to make required payments under the loan and security agreement; we breach any of our covenants under the loan and security agreement, subject to specified cure periods with respect to certain breaches; the Lender determines that a material adverse change (as defined in the loan and security agreement) has occurred; we or our assets become subject to certain legal proceedings, such as bankruptcy proceedings; we are unable to pay our debts as they become due; or we default on contracts with third parties which would permit the third party to accelerate the maturity of such indebtedness or that could have a material adverse change on us. We may not have enough available cash or be able to raise additional funds through equity or debt financings to repay such indebtedness at the time any such event of default occurs. In such a case, we may be required to delay, limit, reduce or terminate our product development or operations or grant to others rights to develop and market products that we would otherwise prefer to develop and market ourselves. The Lender could also exercise its rights as secured lender to take possession of and to dispose of the collateral securing the term loan, which collateral includes substantially all of our property (excluding intellectual property, which is subject to a negative pledge). Our business, financial condition, results of operations and prospects could be materially adversely affected as a result of any of these events.

International expansion of our business exposes us to business, regulatory, political, operational, financial and economic risks associated with doing business outside of the United States.

We currently have limited international operations, but our business strategy incorporates potentially significant international expansion. We currently maintain a small sales force internationally and engage one distributor. We also have relationships with customers outside of the United States and may in the future expand our international customer base. Doing business internationally involves a number of risks, including:

- multiple, conflicting and changing laws and regulations such as privacy regulations, tax laws, export and import restrictions, tariffs, economic sanctions and embargoes, employment laws, regulatory requirements and other governmental approvals, permits and licenses;
- failure by us or our distributors to obtain approvals to conduct our business in various countries;
- differing intellectual property rights;
- complexities and difficulties in obtaining intellectual property protection, enforcing our intellectual property and defending against third-party intellectual property claims;
- difficulties in staffing and managing foreign operations;
- logistics and regulations associated with shipping systems and parts and components for systems and consumables, as well as transportation delays;
- travel restrictions that limit the ability of marketing, presales, sales, services and support teams to service customers;
- financial risks, such as longer payment cycles, difficulty collecting accounts receivable, the impact of local and regional financial crises on demand and payment for our products and exposure to foreign currency exchange rate fluctuations;

- international trade disputes that could result in tariffs and other protective measures;
- natural disasters, political and economic instability, including wars, terrorism and political unrest, outbreak of disease, boycotts, curtailment of trade and other business restrictions; and
- regulatory and compliance risks, including severe penalties such as criminal and civil penalties, disgorgement and other remedial measures, that relate to the U.S. Foreign Corrupt Practices Act, the U.K. Bribery Act 2010 and similar anti-bribery and anticorruption laws in other jurisdictions.

Any of these factors could significantly harm our future international expansion and operations and, consequently, our business, financial condition, results of operations and prospects. In addition, certain international markets are subject to significant political and economic uncertainty, including for example the effect of the withdrawal of the United Kingdom from the European Union. Significant political and economic developments in international markets for which we intend to operate, or the perception that any of them could occur, creates further challenges for operating in these markets in addition to creating instability in global economic conditions.

Certain legal and political risks are also inherent in foreign operations. There is a risk that foreign governments may nationalize private enterprises in certain countries where we may operate. In certain countries or regions, terrorist activities and the response to such activities may threaten our operations more than in the United States. Social and cultural norms in certain countries may not support compliance with our corporate policies, including those that require compliance with substantive laws and regulations. Also, changes in general economic and political conditions in countries where we may operate are a risk to our financial performance and future growth. Additionally, the need to identify financially and commercially strong collaborators and customers for operations outside the United States who will comply with the high legal and regulatory standards we require is a risk to our financial performance. As we operate our business globally, our success will depend, in part, on our ability to anticipate and effectively manage these and other related risks. There can be no assurance that the consequences of these and other factors relating to our international operations will not have an adverse effect on our business, financial condition or results of operations.

Our employees, consultants and collaborators may engage in misconduct or other improper activities.

We are exposed to the risk of fraud or other misconduct by our employees, consultants and collaborators. Misconduct by these parties could include intentional failures to comply with the applicable laws and regulations in the United States and abroad, report financial information or data accurately or disclose unauthorized activities to us. These laws and regulations may restrict or prohibit a wide range of pricing, discounting and other business arrangements. Such misconduct could result in legal or regulatory sanctions and cause serious harm to our reputation. It is not always possible to identify and deter misconduct, and any precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses, or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to comply with these laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, we could be subject to significant civil, criminal and administrative penalties, which could have a material adverse impact on our business. Whether or not we are successful in defending against such actions or investigations, we could incur substantial costs, including legal fees and divert the attention of management in defending ourselves against any of these claims or investigations, which could have a material adverse impact on our business.

We and our employees are increasingly utilizing social media tools as a means of communication both internally and externally.

Despite our efforts to monitor evolving social media communication guidelines and comply with applicable rules, there is risk that the use of social media by us or our employees to communicate about our products or business may cause us to be found in violation of applicable requirements. In addition, our employees may knowingly or inadvertently make use of social media in ways that may not comply with applicable laws and regulations, our policies and other legal or contractual requirements, which may give rise to regulatory enforcement action, liability, lead to the loss of trade secrets or other intellectual property or result in public exposure of personal

information of our employees, customers and others. Furthermore, negative posts or comments about us or our products in social media could seriously damage our reputation, brand image and goodwill. Any of these events could have a material adverse effect on our business, prospects, operating results and financial condition and could adversely affect the price of our Class A common stock.

Risks related to manufacturing and supply

If our sole manufacturing and development facility becomes damaged or inoperable or we are required to vacate our existing facility, our ability to conduct and pursue our manufacturing and development efforts will be jeopardized.

We currently conduct our development and manufacturing at a single facility located in Lowell, Massachusetts. Our facility and equipment could be harmed or rendered inoperable or inaccessible by natural or man-made disasters or other circumstances beyond our control, including fire, power loss, communications failure, war or terrorism, or another catastrophic event, such as a pandemic or similar outbreak or public health crisis, which may render it difficult or impossible for us to support our customers and develop products. The inability to manufacture our systems and consumables could develop if our facility is inoperable or suffers a loss of utilization for even a short period of time and may result in the loss of customers or harm to our reputation. Furthermore, our facility and the equipment we use to perform our manufacturing and development could be unavailable or costly and time consuming to repair or replace. It would be difficult, time consuming and expensive to rebuild our facility, to locate and qualify a new facility or license or transfer our proprietary technology to a third party. Even in the event we are able to find a third party to assist in manufacturing and development efforts, we may be unable to negotiate commercially reasonable terms to engage with the third party.

We also store a certain amount of inventory of components of our products at our Lowell, Massachusetts facility.

We carry insurance for damage to our property and the disruption of our business, but this insurance may not cover all of the risks associated with damage or disruption to our business, may not provide coverage in amounts sufficient to cover our potential losses and may not continue to be available to us on acceptable terms, if at all.

Our manufacturing operations are dependent upon third-party suppliers, including single-source suppliers, making us vulnerable to supply shortages and price fluctuations, which could harm our business.

We source the components of our Growth Direct system and consumables from third-party suppliers. We do not have supply agreements with most of our suppliers beyond purchase orders and, although we maintain an inventory of components, forecasted amounts may be inaccurate and we may experience shortages as a result of serious supply problems with these suppliers. There can be no assurance that our supply of components will not be limited, interrupted, or of satisfactory quality or continue to be available at acceptable prices. For example, we have experienced disruptions to our supply chain as a result of the COVID-19 pandemic and may experience additional disruptions in the future.

Certain critical components of our Growth Direct system and consumables we obtain from single suppliers and the loss of supply from any of these suppliers could materially adversely affect our business. To protect against such loss, we maintain, or are working to obtain, sufficient inventory of these components to allow us to continue to manufacture our systems and consumables during the period required to qualify a new supplier. For example, the manufacturer of the camera used in our Growth Direct system intends to discontinue production of the camera, and we have obtained a supply we believe is sufficient to allow us to qualify a new camera supplier. While we believe we have, or will have, sufficient inventory to provide protection against changes in our sole suppliers, our estimates of the length of time required to qualify a new supplier or inventory level required to manufacture our systems and consumables during that time may be incorrect, and we may run out of inventory sooner than we anticipate. In addition, we have not obtained sufficient inventory for all of our single-source components and we may not be able to do so in the amounts we predict will be required. In addition, any change to a new supplier will require us to devote substantial time and resources, result in additional costs, and could involve a period in which our products might not be produced in a timely or consistent manner. We may also be unable to enter into agreements with new suppliers on commercially reasonable terms or at all. The occurrence of any of these

events could adversely affect our business and customer relationships. In addition, loss of any critical component provided by a single-source supplier could require us to change the design of our manufacturing process based on the functions, limitations, features and specifications of the replacement components.

Several other non-critical components and materials that comprise our Growth Direct platform are currently manufactured by a single supplier or a limited number of suppliers. In many of these cases, we have not yet qualified alternate suppliers and rely upon purchase orders, rather than long-term supply agreements. A supply interruption or an increase in demand beyond our current suppliers' capabilities could harm our ability to manufacture our products unless and until new sources of supply are identified and qualified. Our reliance on these suppliers subjects us to a number of risks that could harm our business, including:

- interruption of supply resulting from modifications to or discontinuation of a supplier's operations;
- delays in product shipments resulting from uncorrected defects, reliability issues, or a supplier's variation in a component;
- a lack of long-term supply arrangements for key components with our suppliers;
- inability to obtain adequate supply in a timely manner, or to obtain adequate supply on commercially reasonable terms;
- difficulty and cost associated with locating and qualifying alternative suppliers for our components in a timely manner;
- a modification or change in a manufacturing process or part that unknowingly or unintentionally negatively impacts the operation of our products;
- production delays related to the evaluation and testing of products from alternative suppliers, and corresponding regulatory qualifications;
- delay in delivery due to our suppliers prioritizing other customer orders over ours;
- damage to our brand reputation caused by defective components produced by our suppliers;
- increased cost of our warranty program due to product repair or replacement based upon defects in components produced by our suppliers; and
- fluctuation in delivery by our suppliers due to changes in demand from us or their other customers.

Any interruption in the supply of components or materials, or our inability to obtain substitute components or materials from alternate sources at acceptable prices in a timely manner, could impair our ability to meet the demand of our customers, which would have an adverse effect on our business.

We forecast sales to determine requirements for components and materials used in our products, and if our forecasts are incorrect, we may experience delays in shipments or increased inventory costs.

To manage our operations with our third-party suppliers, we forecast anticipated product orders and material requirements to predict our inventory needs and enter into purchase orders on the basis of these requirements. Our limited historical commercial experience and recent growth may not provide us with enough data to consistently and accurately predict future demand. If our business expands and our demand for components and materials increases beyond our estimates, we or our suppliers may be unable to meet our demand. In addition, if we underestimate our component and material requirements, we may have inadequate inventory, which could interrupt, delay, or prevent delivery of our products to our customers. By contrast, if we overestimate our component and material requirements, we may have excess inventory, which would increase our expenses. Any of these occurrences would negatively affect our financial performance and business results.

Shipping is a critical part of our business and any changes in our shipping arrangements or damages or losses sustained during shipping could adversely affect our business, financial condition, results of operations and prospects.

Shipments of our products are subject to various regulations in the various countries in which we provide our products. For example, shipments of our growth media consumables may be required to comply with the shipping

requirements promulgated by the U.S. Department of Transportation, or DOT, and the U.S. Federal Aviation Administration, as well as shipment rules established by the International Air Transport Association. If we are unable to comply with any of these rules or regulations, our ability to deliver our products in a timely manner may be adversely affected. In addition, even if we are able to comply with these rules and regulations, compliance can result in increased costs. In either event, our financial results and condition may be adversely affected.

We also currently rely on third-party vendors for our shipping. If we are not able to negotiate acceptable pricing and other terms with these entities or they experience performance problems or other difficulties, it could negatively impact our operating results and our customers' experience. Our products could sustain serious damage or be lost in transit. If a product is damaged in transit, it may result in a substantial delay in the fulfillment of the customer's order, and depending on the type and extent of the damage and whether the incident is covered by insurance, it may result in a substantial financial loss. If our products are not delivered in a timely fashion or are damaged or lost during the delivery process, our customers could become dissatisfied and cease using our products or services, which would adversely affect our business, financial condition, results of operations and prospects.

We use biological and hazardous materials that require considerable expertise and expense for handling, storage and disposal and may result in claims against us.

We work with materials, including chemicals, biological agents and compounds that could be hazardous to human health and safety or the environment. Our operations also produce hazardous and biological waste products. Federal, state and local laws and regulations govern the use, generation, manufacture, storage, handling and disposal of these materials and wastes. We are subject to periodic inspections by federal, state and local authorities to ensure compliance with applicable laws. Compliance with applicable environmental laws and regulations is expensive, and current or future environmental laws and regulations may restrict our operations. If we do not comply with applicable regulations, we may be subject to fines and penalties. In addition, we cannot eliminate the risk of accidental injury or contamination from these materials or wastes, which could cause an interruption of our commercialization efforts, research and development programs and business operations, as well as environmental damage resulting in costly clean-up and liabilities under applicable laws and regulations. In the event of contamination or injury, we could be liable for damages or penalized with fines in an amount exceeding our resources and our operations could be suspended or otherwise adversely affected. Furthermore, environmental laws and regulations are complex, change frequently and have tended to become more stringent. We cannot predict the impact of such changes and cannot be certain of our future compliance.

Risks related to our intellectual property

If we are unable to obtain and maintain sufficient intellectual property protection for our technology, including the Growth Direct platform, or if the scope of the intellectual property protection obtained is not sufficiently broad, our competitors could develop and commercialize products similar or identical to ours, and our ability to successfully commercialize our products may be impaired.

We rely on patent protection as well as trademark, copyright, trade secret and other intellectual property rights protection and contractual restrictions to protect our proprietary technologies, all of which provide limited protection and may not adequately protect our rights or permit us to gain or keep any competitive advantage. If we fail to maintain, protect or enforce our intellectual property, third parties may be able to compete more effectively against us. In addition, we may incur substantial litigation costs in our attempts to recover or restrict use of our intellectual property.

To the extent our intellectual property offers inadequate protection, or is found to be invalid or unenforceable, we would be exposed to a greater risk of direct competition. If our intellectual property does not provide adequate coverage of our competitors' products, our competitive position could be adversely affected, as could our business. Both the patent application process and the process of managing patent disputes can be time consuming and expensive.

As is the case with other technology companies, our success depends in large part on our ability to obtain and maintain protection of the intellectual property we may own solely and jointly with others, particularly patents, in the United States and other countries with respect to our products and technologies. We apply for patents covering our products and technologies and their uses, as we deem appropriate. However, obtaining and enforcing patents in our industry is costly, time consuming and complex, and we may fail to apply for patents on important products, services and technologies in a timely fashion or at all, or we may fail to apply for patents in potentially relevant jurisdictions. We may not be able to file and prosecute all necessary or desirable patent applications, or maintain, enforce and license any patents that may issue from such patent applications, at a reasonable cost or in a timely manner. If we delay in filing a patent application, and a competitor files a patent application on the same or a similar technology before we do, we may face a limited ability to secure patent rights. We may not be able to patent the technology at all. Even if we can patent the technology, we may be able to patent only a limited scope of the technology, and the limited scope may be inadequate to protect our products, or to block competitor products that are similar or adjacent to ours. Our earliest patent filings have been published. A competitor may review our published patents and arrive at the same or similar technology advances for our products as we developed. If the competitor files a patent application on such an advance before we do, then we may no longer be able to protect the technology, we may require a license from the competitor, and if the license is not available on commercially-viable terms, then we may not be able to launch our product. It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. We may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the rights to patents licensed to third parties. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business.

It is possible that none of our pending patent applications will result in issued patents in a timely fashion or at all, and even if patents are granted, they may not provide a basis for intellectual property protection of commercially viable products or services, may not provide us with any competitive advantages, or may be challenged and invalidated by third parties. It is possible that others will design around our current or future patented technologies. It is possible that in the future some of our patents, licensed patents and patent applications may be challenged at the United States Patent and Trademark Office, or USPTO, or in proceedings before the patent offices of other jurisdictions. We may not be successful in defending any such challenges made against our patents or patent applications. Any successful third-party challenge to our patents could result in our patents being narrowed, invalidated or held unenforceable which could result in increased competition to our business. We may have to challenge the patents or patent applications of third parties. The outcome of patent litigation or other proceeding can be uncertain, and any attempt by us to enforce our patent rights against others or to challenge the patent rights of others may not be successful, or, if successful, may take substantial time and result in substantial cost, and may divert our efforts and attention from other aspects of our business.

The patent positions of technology companies can be highly uncertain and involve complex legal and factual questions for which important legal principles remain unresolved. No consistent policy regarding the breadth of claims allowed in such companies' patents has emerged to date in the United States or elsewhere. Courts frequently render opinions that may affect the patentability of certain inventions or discoveries. If the breadth or strength of protection provided by the patents and patent applications we hold with respect to our products is threatened, it could dissuade companies from collaborating with us to develop, and threaten our ability to commercialize, our products.

Our current and future licensors may retain certain rights under their agreements with us, including the right to use the underlying technology for noncommercial academic and research use, to publish general scientific findings from research related to the technology and to make customary scientific and scholarly disclosures of information relating to the technology. It is difficult to monitor whether our licensors limit their use of the technology to these uses, and we could incur substantial expenses to enforce our rights in the event of misuse.

Patent terms may be inadequate to protect our competitive position on our products for an adequate amount of time.

Patents have a limited lifespan. In the United States, if all maintenance fees are timely paid, the natural expiration of a patent is generally 20 years from its earliest U.S. non-provisional filing date. Various extensions may be

available, but the life of a patent, and the protection it affords, is limited. Even if patents covering our products are obtained, once the patent life has expired, we may be open to competition from competitive products. If one of our products requires extended development or testing, patents protecting such products might expire before or shortly after such products are commercialized. For example, while our patents and, if issued, our patent applications have terms that will expire through 2039, certain of our U.S. patents covering the Growth Direct system and its use are scheduled to expire in 2024, and the corresponding foreign patents are scheduled to expire in 2022. Although we own other patents with later expiration dates that cover various improvements and consumables for the Growth Direct platform, these other patents may not provide the same protection as the earliest-filed patents As a result, our patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours, which would have a material adverse effect on our business.

The United States government may exercise certain rights with regard to certain of our inventions developed using government funding.

The United States federal government retains certain rights in inventions produced with its financial assistance under the Patent and Trademark Law Amendments Act, or the Bayh-Dole Act. Certain of our inventions for which we have pursued, and in some cases obtained, patent protection were developed using federal funding from the U.S. Department of Health and Human Services Biomedical Advanced Research & Development Authority, or BARDA. As a result, the U.S. government may have certain rights, including so-called march-in rights, to any patent rights that were funded in party by the U.S. government and any products or technology developed from such patent rights. When new technologies are developed with U.S. government funding, the U.S. government generally obtains certain rights in any resulting patents, including a nonexclusive license authorizing the U.S. government to use the invention for non-commercial purposes. These rights may permit the U.S. government to disclose our confidential information to third parties and to exercise march-in rights to use or to allow third parties to use our licensed technology. The U.S. government can exercise its march-in rights if it determines that action is necessary because we fail to achieve the practical application of government-funded technology, because action is necessary to alleviate health or safety needs, to meet requirements of federal regulations, or to give preference to U.S. industry. In addition, our rights in such inventions may be subject to certain requirements to manufacture products embodying such inventions in the United States. Any exercise by the U.S. government of such rights could harm our business, financial condition, results of operations and prospects.

In addition to our current inventions developed using BARDA funds, we also sometimes collaborate with academic institutions to accelerate our research or development. While it is our policy to avoid engaging our university partners in projects in which there is a risk that federal funds may be commingled, we cannot be sure that any co-developed intellectual property will be free from government rights pursuant to the Bayh-Dole Act. If, in the future, we co-own or in-license in technology which is critical to our business that is developed in whole or in part with federal funds subject to the Bayh-Dole Act, our ability to enforce or otherwise exploit patents covering such technology may be adversely affected.

If we are unable to protect the confidentiality of our trade secrets, the value of our technology could be materially adversely affected and our business could be harmed.

We rely heavily on trade secrets and confidentiality agreements to protect our unpatented know-how, technology and other proprietary information, including parts of our technology platform, and to maintain our competitive position and we expect our reliance to increase in the near term as the terms for certain of our patents expire. For example, while our patents and, if issued, our patent applications have terms that will expire through 2039, some of our U.S. patents covering the Growth Direct system and its use are expected to expire in 2024, and the corresponding foreign patents are scheduled to expire in 2022. Once these patents expire, we may have to rely more heavily on trade secrets to maintain our competitive advantage. Any disclosure, either intentional or unintentional, by our employees, consultants and vendors that we engage to perform research or manufacturing activities, or misappropriation by third parties (such as through a cybersecurity breach) of our trade secrets or proprietary information could enable competitors to duplicate or surpass our technological achievements, thus eroding our competitive position in our market. Because we expect to rely on third parties in the development and

manufacture of our products, we must, at times, share trade secrets with them. Our reliance on third parties requires us to share our trade secrets, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed.

Trade secrets and know-how can be difficult to protect. In addition to pursuing patents on our technology, we take steps to protect our intellectual property and proprietary technology by entering into agreements, including confidentiality agreements, non-disclosure agreements and intellectual property assignment agreements, with our employees, consultants, advisors, collaborators and customers. However, we cannot be certain that such agreements have been entered into with all relevant parties, and we cannot be certain that our trade secrets and other confidential proprietary information will not be disclosed or that competitors will not otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques. For example, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Such agreements may not be enforceable or may not provide meaningful protection for our trade secrets or other proprietary information in the event of unauthorized use or disclosure or other breaches of the agreements, and we may not be able to prevent such unauthorized disclosure, which could materially adversely impact our business and financial position. If we are required to assert our rights against such a party, it could result in significant cost and distraction.

Monitoring unauthorized disclosure is difficult, and we do not know whether the steps we have taken to prevent such disclosure are, or will be, adequate. If we were to enforce a claim that a third party had illegally obtained and was using our trade secrets, it would be expensive and time consuming, and the outcome would be unpredictable. In addition, if we choose to go to court to stop a third party from using any of our trade secrets, it may result in a public disclosure of our trade secrets and corresponding loss of rights, which could have a material adverse effect on our business. In addition, courts outside the United States may be less willing to protect trade secrets. We may need to share our proprietary information, including trade secrets, with future business partners, collaborators, contractors and others located in countries at heightened risk of theft of trade secrets, including through direct intrusion by private parties or foreign actors, and those affiliated with or controlled by state actors.

We also seek to preserve the integrity and confidentiality of our confidential proprietary information by maintaining physical security of our premises and physical and electronic security of our information technology systems, but it is possible that these security measures could be breached. If any of our confidential proprietary information were to be lawfully obtained or independently developed by a competitor or other third party, absent patent protection, we would have no right to prevent such competitor from using that technology or information to compete with us, which could harm our competitive position. If any of our trade secrets were to be disclosed to, or independently discovered by, a competitor or other third party, it could harm our business, financial condition, results of operations and prospects.

We rely on in-licenses from third parties. If we lose these rights, our business may be materially adversely affected, our ability to develop improvements to our Growth Direct platform and to develop new technologies may be negatively and substantially impacted, and if disputes arise, we may be subjected to future litigation as well as the potential loss of or limitations on our ability to develop and commercialize products and technology covered by these license agreements.

We are party to a royalty-bearing license agreement with Thermo CRS, Ltd., or Thermo Fisher, that grants us rights to exploit certain patent rights that are related to our Growth Direct platform. We may need to obtain additional licenses from others to advance our research, development and commercialization activities. These and other intellectual property license agreements that we enter into with third parties may impose various development, regulatory and/or commercial diligence obligations, payment of milestones and/or royalties and other obligations on us. Our rights to use the technology we license are subject to the continuation of and compliance with the terms of these agreements. If we fail to comply with our obligations under these agreements (including as a result of COVID-19 impacting our operations), we use the licensed intellectual property in an unauthorized manner or we are subject to bankruptcy-related proceedings, the terms of the licenses may be materially modified, such as by rendering currently exclusive licenses non-exclusive, or it may give our licensors

the right to terminate their respective agreement with us, which could limit our ability to implement our current business plan and materially adversely affect our business, financial condition, results of operations and prospects.

In some cases, we may not control the prosecution, maintenance or filing of the patents to which we hold licenses, or the enforcement of those patents against third parties. Our licensors may not successfully prosecute the patent applications to which we are licensed. Even if patents are issued in respect of these patent applications, our licensors may fail to maintain these patents, may determine not to pursue litigation against other companies that are infringing these patents, or may pursue such litigation less aggressively than we would. Without protection for the intellectual property we license, other companies might be able to offer substantially identical products for sale, which could adversely affect our competitive business position and harm our business prospects. Further, we may have limited control over these activities or any other intellectual property that may be in-licensed. For example, we cannot be certain that such activities by licensors have been or will be conducted in compliance with applicable laws and regulations or will result in valid and enforceable patents and other intellectual property rights. We may have limited control over the manner in which our licensors initiate an infringement proceeding against a third-party infringer of the intellectual property rights, or defend certain of the intellectual property that is licensed to us. It is possible that the licensors' infringement proceeding or defense activities may be less vigorous than had we conducted them ourselves. In the event our licensors fail to adequately pursue and maintain patent protection for patents and applications they control, and to timely cede control of such prosecution to us, our competitors might be able to enter the market, which would have a material adverse effect on our business.

Moreover, disputes may arise with respect to our licensing or other agreements, including:

- the scope of rights granted under the agreements and other interpretation-related issues;
- the extent to which our systems and consumables, technology and processes infringe on the intellectual property of the licensor that is not subject to the licensing agreement;
- our diligence obligations under the license agreements and what activities satisfy those diligence obligations;
- the inventorship and ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us; and
- the priority of invention of patented technology.

In spite of our efforts to comply with our obligations under our in-license agreements, our licensors might conclude that we have materially breached our obligations under our license agreements and might therefore, terminate the relevant license agreement, thereby removing or limiting our ability to develop and commercialize products and technology covered by these license agreements. If any such in-license agreement is terminated, or if the licensed patents fail to provide the intended exclusivity, competitors or other third parties might have the freedom to market or develop products similar to ours. In addition, absent the rights granted to us under such license agreements, we may infringe the intellectual property rights that are the subject of those agreements, we may be subject to litigation by the licensor, and if such litigation by the licensor is successful we may be required to pay damages to the licensor, or we may be required to cease our development and commercialization activities that are deemed infringing, and in such event we may ultimately need to modify our activities or products to design around such infringement, which will consume time and resources and may not be ultimately successful. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations and prospects. In particular, if our license with Thermo Fischer is terminated, we may suffer the foregoing consequences with respect to our business.

In addition, our rights to certain technologies are licensed to us on a non-exclusive basis. The owners of these non-exclusively licensed technologies are therefore free to license them to third parties, including our competitors, on terms that may be superior to those offered to us, which could place us at a competitive disadvantage. Moreover, our licensors may own or control intellectual property that has not been licensed to us and, as a result, we may be subject to claims, regardless of their merit, that we are infringing or otherwise violating the licensor's rights. In addition, certain of our agreements with third parties may provide that intellectual property arising

under these agreements, such as data that could be valuable to our business, will be owned by the counterparty, in which case, we may not have adequate rights to use such data or have exclusivity with respect to the use of such data, which could result in third parties, including our competitors, being able to use such data to compete with us.

Changes in patent law in the United States and other jurisdictions could diminish the value of patents in general, thereby impairing our ability to protect our products.

Changes in either the patent laws or in interpretations of patent laws in the United States or other countries or regions may diminish the value of our intellectual property. We cannot predict the breadth of claims that may be allowed or enforced in our patents or in third party patents. We may not develop additional proprietary products, methods and technologies that are patentable.

Generally, jurisdictions outside the United States have a "first to file" patent system. In the United States, prior to March 2013, the "first to invent" a claimed invention was entitled to the patent (assuming that all other requirements were met). After March 2013, following the passage of the Leahy-Smith America Invents Act, or the America Invents Act, the United States transitioned to a "first inventor to file" system, under which the first inventor to file a patent application on an invention is entitled to the patent (assuming that all other requirements are met) even if another party was the first to invent the claimed invention. The America Invents Act also included a number of significant changes that affect the way patent applications are prosecuted and that also may affect patent litigation. These include the introduction of derivation proceedings; expansion of the permitted content of third-party submissions to the USPTO during patent prosecution; and additional procedures to challenge the validity of a patent after issuance, including post-grant review and *inter partes* review. Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in United States federal courts necessary to invalidate a patent claim, a third party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our patent claims that would not have been invalidated if first challenged by the third party as a defendant in a district court action. The America Invents Act and its continued implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business, financial condition, results of operations, and prospects.

In addition, the patent position of companies like us is particularly uncertain. Depending on future actions by the U.S. Congress, the U.S. courts, the USPTO and the relevant law-making bodies in other countries, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future. For example, various courts, including the United States Supreme Court have rendered decisions that affect the scope of patentability of certain inventions or discoveries. These decisions state, among other things, that a patent claim that recites an abstract idea, natural phenomenon or law of nature are not themselves patentable. Precisely what constitutes a law of nature or abstract idea is uncertain, and it is possible that certain aspects of our technology could be considered to be or apply laws of nature. Accordingly, the evolving case law in the United States may adversely affect our ability to obtain patents and may facilitate third party challenges to any owned or licensed patents.

Issued patents covering our products could be found invalid or unenforceable if challenged in court or before administrative bodies in the United States or abroad, including the USPTO.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability. Some of our patents or patent applications (including licensed patents) may be challenged in opposition, derivation, reexamination, *inter partes* review, post-grant review or interference. Any successful third-party challenge to our patents in this or any other proceeding could result in the unenforceability or invalidity of such patents, which could harm our business. In addition, in patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, for example, lack of novelty, obviousness or non-enablement. Grounds

for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld material information from the USPTO or the applicable foreign counterpart, or made a misleading statement, during prosecution. A litigant or the USPTO itself could challenge our patents on this basis even if we believe that we have conducted our patent prosecution in accordance with the duty of candor and in good faith. Further, with respect to challenges to the validity of our patents, there might be invalidating prior art, of which we and the patent examiner were unaware during prosecution. The outcome following legal assertions of invalidity and unenforceability during patent litigation is unpredictable. If a defendant were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of the patent protection on certain aspects of our platform technologies. The cost of defending such a challenge, particularly in a foreign jurisdiction, and any resulting loss of patent protection could have a material adverse impact on one or more of our products and our business. In addition, if the breadth or strength of protection provided by our patents and patent applications is threatened, regardless of the outcome, it could dissuade companies from collaborating with us to license, develop or commercialize current or future products. Enforcing our intellectual property rights against third parties may also cause such third parties to file other counterclaims against us, which could be costly to defend, particularly in a foreign jurisdiction, and could require us to pay substantial damages, cease the sale of certain products or enter into a license agreement and pay royalties (which may not be possible on commercially reasonable terms or at all). Any efforts to enforce our intellectual property rights are also likely to be costly and may divert the efforts of our scientific and management personnel.

We may not be aware of all third-party intellectual property rights potentially relating to our products. Publications of discoveries often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until approximately 18 months after filing or, in some cases, not until such patent applications issue as patents. We might not have been the first to make the inventions covered by each of our pending patent applications and we might not have been the first to file patent applications for these inventions. To determine the priority of these inventions, we may have to participate in interference proceedings, derivation proceedings or other post-grant proceedings declared by the USPTO that could result in substantial cost to us. The outcome of such proceedings is uncertain. No assurance can be given that other patent applications will not have priority over our patent applications.

If we cannot acquire or license rights to use technologies on reasonable terms, we may not be able to commercialize new products in the future.

In the future, we may identify third-party intellectual property and technology we may need to license in order to engage in our business, including to develop or commercialize new products or services, and the growth of our business may depend in part on our ability to acquire, in-license or use this technology. However, such licenses may not be available to us on acceptable terms or at all. The licensing or acquisition of third-party intellectual property rights is a competitive area, and several more established companies may pursue strategies to license or acquire third-party intellectual property rights that we may consider attractive or necessary. These established companies may have a competitive advantage over us due to their size, capital resources and greater development or commercialization capabilities. In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us. Even if such licenses are available, we may be required to pay the licensor in return for the use of such licensor's technology, lump-sum payments, payments based on certain milestones such as sales volumes, or royalties based on sales of our platform. In addition, such licenses may be non-exclusive, which could give our competitors access to the same intellectual property licensed to us. Our business, financial condition, results of operations and prospects could be materially and adversely affected if we are unable to enter into necessary agreements on acceptable terms or at all, if any necessary licenses are subsequently terminated, if the licensors fail to abide by the terms of the licenses or fail to prevent infringement by third parties, or if the acquired or licensed patents or other rights are found to be invalid or unenforceable. Moreover, we could encounter delays in the introduction of products or services while we attempt to develop alternatives.

We may not be able to protect our intellectual property rights throughout the world.

Filing, prosecuting and defending patents on our products in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States can be

less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as the laws of the United States, and we may encounter difficulties in protecting and defending such rights in foreign jurisdictions. Consequently, we may not be able to prevent third parties from practicing our inventions in some or all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and may also export infringing products to territories where we have patent protection, but enforcement is not as strong as that in the United States. These products may compete with our products. Our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing. In addition, certain countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to other parties. Furthermore, many countries limit the enforceability of patents against other parties, including government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of any patents.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of many other countries do not favor the enforcement of patents and other intellectual property protection, which could make it difficult for us to stop the misappropriation or other violations of our intellectual property rights including infringement of our patents in such countries. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial cost and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing, and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, or that are initiated against us, and the damages or other remedies awarded, if any, may not be commercially meaningful. In addition, changes in the law and legal decisions by courts in the United States and foreign countries may affect our ability to obtain adequate protection for our products, services and other technologies and the enforcement of intellectual property. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed confidential information of third parties or that our employees have wrongfully used or disclosed alleged trade secrets of their former employers.

As is common in an industry like ours, we have employed and expect to employ individuals who were previously employed at other companies, including our competitors or potential competitors. Although we try to ensure that our employees, consultants, advisors and independent contractors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that our employees, advisors, consultants or independent contractors have inadvertently or otherwise used or disclosed intellectual property, including trade secrets or other proprietary information of their former employers or other third parties, or to claims that we have improperly used or obtained such trade secrets. Litigation may be necessary to defend against these claims. If we fail in defending such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights and face increased competition to our business. A loss of key research personnel work product could hamper or prevent our ability to commercialize potential products, which could harm our business. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to management.

We may not be able to protect and enforce our trademarks and trade names, or build name recognition in our markets of interest thereby harming our competitive position.

Our trademarks or trade names may be challenged, infringed, diluted, circumvented, declared generic or determined to be infringing on other marks. We may not be able to protect our rights in these trademarks or trade names or may be forced to stop using these names, which we need for name recognition by potential partners or customers in our markets of interest. We have not yet registered certain of our trademarks in all of our potential markets. During the trademark registration process, we may receive Office Actions from the USPTO objecting to the registration of our trademarks. Although we would be given an opportunity to respond to those

objections, we may be unable to overcome such objections. In addition, at the USPTO and at comparable agencies in many foreign jurisdictions, third parties are given an opportunity to oppose pending trademark applications and/or to seek the cancellation of registered trademarks. Opposition or cancellation proceedings may be filed against our trademarks, and our trademarks may not survive such proceedings. If we are unable to obtain a registered trademark or establish name recognition based on our trademarks and trade names, we may not be able to compete effectively and our business may be adversely affected.

We may be subject to claims challenging the inventorship of our patents and other intellectual property.

We or our licensors may be subject to claims that former employees, collaborators or other third parties have an interest in our owned or in-licensed patents, trade secrets or other intellectual property as an inventor or co-inventor. The failure to name the proper inventors on a patent application can impact the validity and enforceability of patents issuing thereon. Inventorship disputes may arise from conflicting views regarding the contributions of different individuals named as inventors, the effects of foreign laws where foreign nationals are involved in the development of the subject matter of the patent, conflicting obligations of third parties involved in developing our product candidates or as a result of questions regarding co-ownership of potential joint inventions. Litigation may be necessary to defend against these and other claims challenging inventorship of our or our licensors' ownership of our owned or in-licensed patents, trade secrets or other intellectual property. Alternatively, or additionally, we may enter into agreements to clarify the scope of our rights in such intellectual property. If we or our licensors fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, intellectual property that is important to our products. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees, and certain customers or partners may defer engaging with us until the particular dispute is resolved. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations and prospects.

In addition, while it is our policy to require our employees and contractors who may be involved in the conception or development of intellectual property to execute agreements assigning such intellectual property to us, we may be unsuccessful in executing such an agreement with each party who, in fact, conceives or develops intellectual property that we regard as our own. The assignment of intellectual property rights may not be self-executing, or the assignment agreements may be breached, and we may be forced to bring claims against third parties, or defend claims that they may bring against us, to determine the ownership of what we regard as our intellectual property. Any of the foregoing could harm our business, financial condition, results of operations and prospects.

We may be involved in litigation claiming that we have infringed on a third party's intellectual property, which could be time consuming and costly and may adversely affect our business, financial condition, results of operations and prospects.

In recent years, there has been significant litigation involving intellectual property rights. We may be involved with litigation or actions at the USPTO or foreign patent offices with various third parties that claim we or our collaborators or customers using our solutions and services have misappropriated or misused other parties' intellectual property rights. We expect that the number of such claims may increase as the number of our products grows, we expand our market share and the level of competition in our markets increases. Any infringement claim, regardless of its validity, could harm our business by, among other things, resulting in time consuming and costly litigation, diverting management's time and attention from the development of the business, requiring the payment of monetary damages (including treble damages, attorneys' fees, costs and expenses) or royalty payments, or result in potential or existing customers delaying purchases of our products or entering into engagements with us pending resolution of the dispute.

As we move into new markets and applications for our platform, incumbent participants in such markets may assert their patents and other proprietary rights against us as a means of slowing our entry into such markets or as a means to extract substantial license and royalty payments from us. Our competitors and others have significantly larger and more mature patent portfolios than we currently have. In addition, future litigation may involve patent holding companies or other adverse patent owners who have no relevant product or service revenue

and against whom our own patents may provide little or no deterrence or protection. Therefore, our commercial success may depend in part on our non-infringement of the patents or proprietary rights of third parties, or the invalidity of such patents or proprietary rights.

Our research, development and commercialization activities may in the future be subject to claims that we infringe or otherwise violate patents or other intellectual property rights owned or controlled by third parties. There is a substantial amount of litigation and other patent challenges, both within and outside the United States, involving patent and other intellectual property rights, including patent infringement lawsuits, interferences, oppositions and *inter partes* review proceedings before the USPTO, and corresponding foreign patent offices. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we are developing products. As the automated MQC testing industry expands and more patents are issued, the risk increases that our products may be subject to claims of infringement of the patent rights of third parties. Numerous significant intellectual property issues have been litigated, are being litigated and will likely continue to be litigated, between existing and new participants in our existing and targeted markets, and one or more third parties may assert that our products or services infringe their intellectual property rights as part of a business strategy to impede our successful entry into or growth in those markets.

Third parties may assert that we are employing their proprietary technology without authorization. Because patent applications can take many years to issue, there may be currently pending patent applications which may later result in issued patents that our current or future products and services may infringe. In addition, similar to what other companies in our industry have experienced, we are aware of a patent, and there may be patents of which we are not aware or that are issued in future, that may cover our platform or its components. Additionally, pending patent applications that have been published can, subject to certain limitations, be later amended in a manner that could cover our platform or its components. Under the applicable law of certain jurisdictions, the scope of a patent claim is determined by an interpretation of the law, the written disclosure in a patent and the patent's prosecution history. Our interpretation of the relevance or the scope of a patent or a pending application may be incorrect, which may negatively impact our ability to market our products. We may incorrectly determine that our products are not covered by a third-party patent or may incorrectly predict whether a third party's pending application will issue with claims of relevant scope. Our determination of the expiration date of any patent in the United States or abroad that we consider relevant may be incorrect, which may negatively impact our ability to develop and market our products.

There can be no assurance that we will prevail in any suit initiated against us by third parties, successfully settle or otherwise resolve patent infringement claims. Third parties making claims against us may be able to obtain injunctive or other relief, which could block our ability to develop, commercialize and sell products or services, and could result in the award of substantial damages against us, including treble damages, attorneys' fees, costs and expenses, if we are found to have willfully infringed. In the event of a successful claim of infringement against us, we may be required to pay damages and ongoing royalties, and obtain one or more licenses from third parties, or be prohibited from selling certain products or services. We may not be able to obtain these licenses on acceptable or commercially reasonable terms, if at all, or these licenses may be non-exclusive, which could result in our competitors gaining access to the same intellectual property. In addition, we could encounter delays and incur significant costs, in product or service introductions while we attempt to develop alternative products or services, or redesign our products or services, to avoid infringing third party patents or proprietary rights. Defense of any lawsuit or failure to obtain any of these licenses or to develop a workaround could prevent us from commercializing products or services, and the prohibition of sale or the threat of the prohibition of sale of any of our products or services could materially affect our business and our ability to gain market acceptance for our products or services. Some of our competitors may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. Further, even if we were successful in defending against a lawsuit, such a defense would distract our management team from our operations, which could have an adverse effect on our business. In addition, any uncertainties resulting from the initiation and continuation of any litigation could have a material adverse effect on our ability to raise the funds necessary to continue our operations or could otherwise have a material adverse effect on our business, results of operations, financial condition and prospects. Furthermore, because of the substantial amount of discovery required in

connection with intellectual property litigation or other legal proceedings relating to our intellectual property rights, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation or other proceedings.

In addition, our agreements with some of our customers, suppliers or other entities with whom we do business require us to defend or indemnify these parties to the extent they become involved in infringement claims, including the types of claims described above. We could also voluntarily agree to defend or indemnify third parties in instances where we are not obligated to do so if we determine it would be important to our business relationships. If we are required or agree to defend or indemnify third parties in connection with any infringement claims, we could incur significant costs and expenses that could adversely affect our business, financial condition, results of operations and prospects.

We may become involved in lawsuits to protect or enforce our intellectual property, which could be expensive, time consuming and unsuccessful.

Third parties, including our competitors, could be infringing, misappropriating or otherwise violating our intellectual property rights. Monitoring unauthorized use of our intellectual property is difficult and costly. From time to time, we seek to analyze our competitors' products and services, and may in the future seek to enforce our rights against potential infringement, misappropriation or violation of our intellectual property. However, the steps we have taken to protect our proprietary rights may not be adequate to enforce our rights against such infringement, misappropriation or violation of our intellectual property. We may not be able to detect unauthorized use of, or take appropriate steps to enforce, our intellectual property rights. Any inability to meaningfully enforce our intellectual property rights could harm our ability to compete and reduce demand for our products and services.

Litigation may be necessary for us to enforce our patent and proprietary rights or to determine the scope, coverage and validity of the proprietary rights of others. If we do not prevail in such legal proceedings, we may be required to pay damages, we may lose significant intellectual property protection for our products or services, such that competitors could copy our products or services and we could be forced to cease commercialization of certain of our products or services. Even if resolved in our favor, any award of monetary damages or other remedy we receive may not be commercially valuable.

Any litigation that may be necessary in the future could result in substantial costs and diversion of resources and could have a material adverse effect on our business, financial condition, results of operations and prospects. In any lawsuit we bring to enforce our intellectual property rights, a court may refuse to the stop the other party from using the technology at issue on grounds that our intellectual property rights do not cover the technology in question. Further, in such proceedings, the defendant could counterclaim that our intellectual property is invalid or unenforceable and the court may agree, in which case we could lose valuable intellectual property rights. The outcome in any such lawsuits are unpredictable. Even if we do prevail in any future litigation related to intellectual property rights, the cost and time requirements of the litigation could negatively impact our financial results. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could compromise our ability to compete in the marketplace.

Intellectual property litigation may lead to unfavorable publicity that harms our reputation and causes the market price of our Class A common stock to decline.

During the course of any intellectual property litigation, there could be public announcements of the initiation of the litigation as well as results of hearings, rulings on motions and other interim proceedings in the litigation. If securities analysts or investors regard these announcements as negative, the perceived value of our existing products, programs or intellectual property could be diminished.

Accordingly, the market price of shares of our Class A common stock may decline. Such announcements could also harm our reputation or the market for our future products, which could have a material adverse effect on our business.

Obtaining and maintaining our patent protection depends on compliance with various required procedures, document submissions, fee payments and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to be paid to the USPTO and various governmental patent agencies outside of the United States at several stages over the lifetime of the patents and/or applications. We have systems in place to remind us to pay these fees, and we rely on our outside counsel using an outside service to pay these fees due to non-U.S. patent agencies. The USPTO and various non-U.S. governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. In many cases, an inadvertent lapse, including due to the effect of the COVID-19 pandemic on us or our vendors, can be cured by payment of a late fee or by other means in accordance with the applicable rules. However, there are situations in which non-compliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, our competitors may be able to enter the market without infringing our patents and this circumstance would have a material adverse effect on our business.

Our use of open-source software could compromise our ability to offer our services and subject us to possible litigation.

We use open-source software licensed to us by third-party authors under “open source” licenses in connection with our products and services. Use and distribution of open-source software may entail greater risks than use of third-party commercial software, as open-source licensors generally do not provide support, warranties, indemnification or other contractual protections regarding infringement claims or the quality of the code.

Further, some open-source software licenses require users who distribute software containing open-source software to publicly disclose all or part of the source code to the licensee’s software that incorporates, links or uses such open-source software, and make available to third parties for no cost, any derivative works of the open source code created by the licensee, which could include the licensee’s own valuable proprietary code. While we monitor our use of open-source software and try to ensure that none is used in a manner that would require us to disclose our proprietary source code or that would otherwise breach the terms of an open source agreement, such use could inadvertently occur, or could be claimed to have occurred, in part because open source license terms are often ambiguous. Despite our efforts to monitor our use of open-source software to avoid subjecting our platform to conditions we do not intend, there is a risk that open source licenses could be construed in a way that could impose unanticipated conditions or restrictions on our ability to provide or distribute our platform. Additionally, we may from time to time face claims from third parties claiming ownership of, or seeking to enforce the terms of, an open source license, including by demanding release of source code for the open-source software, derivative works or our proprietary source code that was developed using, or that is distributed with, such open-source software. These claims could also result in litigation and could require us to make our proprietary software source code freely available, require us to devote additional research and development resources to change re-engineer our platform, seek costly licenses from third parties or otherwise incur additional costs and expenses, any of which could result in reputational harm and would have a negative effect on our business and operating results. There is little legal precedent in this area and any actual or claimed requirement to disclose our proprietary source code or pay damages for breach of contract could harm our business and could help third parties, including our competitors, develop products and services that are similar to or better than ours.

In addition, if the license terms for the open-source software we utilize change, we may be forced to re-engineer our platform, incur additional costs to comply with the changed license terms or replace the affected open-source software. Although we have implemented policies to regulate the use and incorporation of open-source software into our platform and solutions, we cannot be certain that that such policies will be effective and that we have not incorporated open-source software in our platform and solutions in a manner that is inconsistent with such policies.

Risks related to our common stock and this offering

An active trading market for our Class A common stock may not develop.

Prior to this offering, there has been no public market for our Class A common stock. The initial public offering price for our Class A common stock was determined through negotiations with the underwriters. Although we applied to list our Class A common stock on The Nasdaq Global Market, an active trading market for our shares may never develop or be sustained following this offering. If an active market for our Class A common stock does not develop, it may be difficult for you to sell shares you purchase in this offering without depressing the market price for the shares, or at all. Further, an inactive market may also impair our ability to raise capital by selling shares of our Class A common stock and may impair our ability to enter into strategic collaborations or acquire companies or products by using our shares of Class A common stock as consideration.

The market price of our Class A common stock may be volatile and fluctuate substantially, which could result in substantial losses for purchasers of our Class A common stock in this offering.

Our stock price is likely to be volatile. The stock market in general and the market for smaller technology companies in particular has experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, you may not be able to sell your Class A common stock at or above the initial public offering price. The market price for our Class A common stock may be influenced by many factors, including:

- actual or anticipated fluctuations in our financial condition and operating results, including fluctuations in our quarterly and annual results;
- the introduction of new products or product enhancements by us or others in our industry;
- variances in product and system reliability;
- overall conditions in our industry and the markets in which we operate;
- disputes or other developments with respect to our or others' intellectual property rights;
- actual or anticipated changes in our operating results or growth rate as a result of our competitors' operating results;
- our ability to develop and market new and enhanced products and expand into new markets on a timely basis;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- product liability claims or other litigation;
- announcement or expectation of additional financing effort;
- sales of our common stock by us or our stockholders;
- share price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- media exposure of our products or of those of others in our industry;
- changes in earnings estimates or recommendations by securities analysts;
- general market conditions and other factors, including factors unrelated to our operating performance or the operating performance of our competitors; and
- the other factors described in this "Risk Factors" section and elsewhere in this prospectus.

After this offering, our executive officers, directors and principal stockholders, if they choose to act together, will continue to have the ability to control all matters submitted to stockholders for approval.

Upon the closing of this offering, based on the number of shares of Class A common stock outstanding as of May 31 2021, our executive officers, directors and stockholders who owned more than 5% of our outstanding

common stock before this offering and their respective affiliates will, in the aggregate, hold shares representing approximately % of our outstanding voting stock (assuming no exercise of the underwriters' option to purchase additional shares and no conversion of our non-voting Class B common stock into Class A common stock). This percentage may change depending on any conversion of shares of our non-voting Class B common stock into shares of Class A common stock. The holders of shares of our Class B common stock have the ability to convert any portion of their Class B common stock into Class A common stock. Our Class B common stock cannot be converted if, immediately following such conversion, the holder beneficially owns more than 4.9% of the issued and outstanding Class A common stock. Due to this conversion right, holders of our Class B common stock could, at any time, increase their voting control of us. As a result of their combined voting power, if our executive officers, directors and stockholders who owned more than 5% of our outstanding common stock choose to act together, they would be able to control all matters submitted to our stockholders for approval, as well as our management and affairs. For example, these persons, if they choose to act together, would control the election of directors, the composition of our management and approval of any merger, consolidation or sale of all or substantially all of our assets.

The dual class structure of our common stock and the option of the holders of shares of our Class B common stock to convert into shares of our Class A common stock may limit your ability to influence corporate matters.

Our Class A common stock, which is the stock we are offering in this initial public offering, has one vote per share, while our Class B common stock is non-voting. Nonetheless, each share of our Class B common stock may be converted at any time into one share of Class A common stock at the option of its holder, subject to the limitations provided for in our restated certificate of incorporation that prohibit the conversion of our Class B common stock into shares of Class A common stock to the extent that, upon such conversion, such holder would beneficially own in excess of 4.9% of our Class A common stock. Consequently, if holders of Class B common stock following this offering exercise their option to make this conversion, such exercise will have the effect of increasing the relative voting power of those prior holders of our Class B common stock (subject to the ownership limitation described in the previous sentence) and increasing the number of outstanding shares of our voting common stock, and correspondingly decreasing the relative voting power of the current holders of our Class A common stock, which may limit your ability to influence corporate matters.

If you purchase shares of Class A common stock in this offering, you will suffer immediate dilution of your investment.

The initial public offering price of our Class A common stock is substantially higher than the net tangible book value per share of our common stock. Therefore, if you purchase shares of our Class A common stock in this offering, you will pay a price per share that substantially exceeds our net tangible book value per share after this offering. To the extent shares subsequently are issued under outstanding options or warrants, you will incur further dilution. Based on the initial public offering price of $ per share, you will experience immediate dilution of $ per share as of March 31, 2021, representing the difference between our pro forma as adjusted net tangible book value per share, after giving effect to this offering. In addition, purchasers of Class A common stock in this offering will have contributed approximately % of the aggregate price paid by all purchasers of our stock but will own only approximately % of our common stock outstanding after this offering.

We have broad discretion in the use of the net proceeds from this offering and may not use them effectively.

Our management will have broad discretion in the application of the net proceeds from this offering and could spend the proceeds in ways that do not improve our results of operations or enhance the value of our common stock. We expect that we will use the net proceeds from this offering, together with our existing cash and cash equivalents and short-term investments to expand our commercial resources and capabilities, for research and development, to expand our operations globally, and for working capital and other general corporate purposes as set forth under the section titled "Use of Proceeds." However, our actual use of these proceeds may differ substantially from our current plans. The failure by our management to apply these funds effectively could result in financial losses that could have a material adverse effect on our business, cause the price of our Class A

common stock to decline and delay the development of our product candidates. Pending their use, we may invest the net proceeds from this offering in a manner that does not produce income or that loses value.

A significant portion of our total outstanding shares are eligible to be sold into the market in the near future, which could cause the market price of our Class A common stock to drop significantly, even if our business is doing well.

Sales of a substantial number of shares of our Class A common stock in the public market, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our Class A common stock.

After this offering, we will have outstanding shares of Class A common stock and Class B common stock, collectively, based on the number of shares outstanding as of May 31, 2021. This includes the shares that we are selling in this offering, which may be resold in the public market immediately without restriction, unless purchased by our affiliates. The remaining shares are currently restricted as a result of applicable securities laws or lock-up agreements and will become eligible to be sold at various times beginning 180 days after this offering, unless held by one of our affiliates, in which case the resale of those securities will be subject to certain restrictions under the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder. Moreover, pursuant to an investors' rights agreement entered into with certain of our stockholders, after this offering, holders of an aggregate of shares of our Class A common stock (including shares issuable upon conversion of our Class B common stock) will have rights, subject to specified conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders, until the rights terminate. We also intend to register all shares of Class A common stock that we may issue under our equity compensation plans. Once we register these shares, they can be freely sold in the public market upon issuance, subject to limitations applicable to affiliates and the lock-up agreements described in the "Underwriting" section of this prospectus.

We are an "emerging growth company," and the reduced disclosure requirements applicable to emerging growth companies may make our Class A common stock less attractive to investors.

We are an "emerging growth company," as defined in the JOBS Act, and may remain an emerging growth company until the last day of the fiscal year following the fifth anniversary of the closing of this offering. However, if certain events occur prior to the end of such five-year period, including if we become a "large accelerated filer," our annual gross revenues exceed $1.07 billion or we issue more than $1.0 billion of non-convertible debt in the previous three-year period, we will cease to be an emerging growth company prior to the end of such five-year period. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- being permitted to provide only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure in this prospectus;
- not being required to comply with the auditor attestation requirements in the assessment of our internal control over financial reporting;
- reduced disclosure obligations regarding executive compensation;
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved and from providing the pay ratio between our Chief Executive Officer and employees; and
- an exemption from compliance with the requirements of the Public Company Accounting Oversight Board regarding the communication of critical audit matters in the auditor's report on the financial statements.

We have taken advantage of reduced reporting requirements in this prospectus. In particular, in this prospectus, we have provided only two years of audited financial statements and have not included all of the executive

compensation related information that would be required if we were not an emerging growth company. We cannot predict whether investors will find our Class A common stock less attractive if we rely on these exemptions. If some investors find our Class A common stock less attractive as a result, there may be a less active trading market for our Class A common stock and our stock price may be reduced or more volatile. In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of these accounting standards until they would otherwise apply to private companies. We intend to utilize the extended transition period and, as a result, we will not be required to comply with new or revised accounting standards on the same time line as other public companies.

We are a "smaller reporting company" and the reduced disclosure requirements applicable to smaller reporting companies may make our Class A common stock less attractive to investors.

We are a "smaller reporting company" and are therefore entitled to rely on certain reduced disclosure requirements for as long as we remain a smaller reporting company, such as reduced disclosure requirements for executive compensation. This reduced disclosure in our Securities and Exchange Commission, or SEC, filings due to our status as a smaller reporting company may make it harder for investors to analyze our results of operations and financial prospects. We cannot predict if investors will find our Class A common stock less attractive because we may rely on these exemptions. If some investors find our Class A common stock less attractive as a result, there may be a less active trading market for our Class A common stock and our stock prices may be more volatile.

If we fail to maintain effective internal control over financial reporting and effective disclosure controls and procedures, we may not be able to accurately report our financial results in a timely manner or prevent fraud, which may adversely affect investor confidence in our company.

We are not currently required to comply with the rules of the SEC implementing Section 404 of the Sarbanes-Oxley Act, or Section 404, and, therefore, we are not required to make a formal assessment of the effectiveness of our internal control over financial reporting. Upon becoming a public company, we will be required to comply with the SEC's rules implementing Sections 302 and 404 of the Sarbanes-Oxley Act, which require management to certify financial and other information in our quarterly and annual reports and provide an annual management report on the effectiveness of controls over financial reporting. Although we will be required to disclose changes made in our internal controls and procedures on a quarterly basis, we are not required to make our first annual assessment of our internal control over financial reporting pursuant to Section 404 until the year following our first annual report required to be filed with the SEC. As an emerging growth company, our independent registered public accounting firm will not be required to attest to the effectiveness of our internal control over financial reporting pursuant to Section 404 until the later of the year following our first annual report required to be filed with the SEC or the date we are no longer an emerging growth company and a "non-accelerated filer." At such time, our independent registered public accounting firm may issue a report that is adverse in the event material weaknesses have been identified in our internal control over financial reporting.

To comply with the requirements of being a public company, we will need to undertake actions, such as implementing new internal controls and procedures and hiring additional accounting or internal audit staff. Testing and maintaining internal control can divert our management's attention from other matters that are important to the operation of our business. In addition, when evaluating our internal control over financial reporting, we may identify material weaknesses that we may not be able to remediate in time to meet the applicable deadline imposed upon us for compliance with the requirements of Section 404. If we identify any material weaknesses in our internal control over financial reporting or we are unable to comply with the requirements of Section 404 in a timely manner or assert that our internal control over financial reporting is effective, investors may lose confidence in the accuracy and completeness of our financial reports. As a result, the market price of our Class A common stock could be materially adversely affected.

Our disclosure controls and procedures may not prevent or detect all errors or acts of fraud.

Upon the closing of this offering, we will become subject to the periodic reporting requirements of the Exchange Act. We are continuing to refine our disclosure controls and procedures to provide reasonable assurance that

information we must disclose in reports we file or submit under the Exchange Act is accumulated and communicated to management, and recorded, processed, summarized and reported within the time periods specified in the rules and forms of the SEC. We believe that any disclosure controls and procedures, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met.

These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by an unauthorized override of the controls. Accordingly, because of the inherent limitations in our control system, misstatements due to error or fraud may occur and not be detected, which could have a material adverse effect on investors' confidence in our reporting and the price of our Class A common stock.

Provisions in our restated certificate of incorporation and amended and restated bylaws and under Delaware law could make an acquisition of our company, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our restated certificate of incorporation and our amended and restated bylaws, which will become effective upon the closing of this offering may discourage, delay or prevent a merger, acquisition or other change in control of our company that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares. These provisions could also limit the price that investors might be willing to pay in the future for shares of our Class A common stock, thereby depressing the market price of our Class A common stock. In addition, because our board of directors is responsible for appointing the members of our management team, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. Among other things, these provisions include those establishing:

- a classified board of directors with three-year staggered terms, which may delay the ability of stockholders to change the membership of a majority of our board of directors;
- no cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;
- the exclusive right of our board of directors to elect a director to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director, which prevents stockholders from filling vacancies on our board of directors;
- the ability of our board of directors to authorize the issuance of shares of preferred stock and to determine the terms of those shares, including preferences and voting rights, without stockholder approval, which could be used to significantly dilute the ownership of a hostile acquirer;
- the ability of our board of directors to alter our bylaws without obtaining stockholder approval;
- the required approval of the holders of at least two-thirds of the shares entitled to vote at an election of directors to adopt, amend or repeal our bylaws or repeal the provisions of our restated certificate of incorporation regarding the election and removal of directors;
- the required approval of the holders of at least two-thirds of the shares entitled to vote thereon to (i) effect a reorganization, recapitalization, share exchange, share classification, consolidation, conversion or merger, (ii) sell, lease, exchange, transfer or otherwise dispose of all or substantially all of our assets, or (iii) dissolve our company or revoke a dissolution of our company;
- a prohibition on stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;
- the requirement that a special meeting of stockholders may be called only by the chairman of the board of directors, the chief executive officer, the president or the board of directors, which may delay the ability of our stockholders to force consideration of a proposal or to take action, including the removal of directors; and

- advance notice procedures that stockholders must comply with in order to nominate candidates to our board of directors or to propose matters to be acted upon at a stockholders' meeting, which may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of us.

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the General Corporation Law of the State of Delaware, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner.

Our restated certificate of incorporation designates specific courts as the exclusive forum for certain litigation that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us.

Our restated certificate of incorporation, which will become effective upon the closing of this offering, specifies that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for most legal actions involving claims brought against us by stockholders; provided that, the exclusive forum provision will not apply to suits brought to enforce any liability or duty created by the Securities Act, the Exchange Act, the rules and regulations thereunder or any other claim for which the federal courts have exclusive jurisdiction; and provided further that, if and only if the Court of Chancery of the State of Delaware dismisses any such action for lack of subject matter jurisdiction, such action may be brought in another state or federal court sitting in the State of Delaware. Our restated certificate of incorporation further provides that, unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States of America shall, to the fullest extent permitted by law, be the sole and exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our restated certificate of incorporation described above.

We believe these provisions benefit us by providing increased consistency in the application of Delaware law by chancellors particularly experienced in resolving corporate disputes and in the application of the Securities Act by federal judges, as applicable, efficient administration of cases on a more expedited schedule relative to other forums and protection against the burdens of multi-forum litigation. However, the provision may have the effect of discouraging lawsuits against our directors, officers, employees and agents as it may limit any stockholder's ability to bring a claim in a judicial forum that such stockholder finds favorable for disputes with us or our directors, officers, employees or agents. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with any applicable action brought against us, a court could find the choice of forum provisions contained in our restated certificate of incorporation to be inapplicable or unenforceable in such action. If a court were to find the choice of forum provision contained in our restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could adversely affect our business, financial condition or results of operations.

Because we do not anticipate paying any cash dividends on our common stock in the foreseeable future, capital appreciation, if any, would be your sole source of gain.

We have never declared or paid any cash dividends on our common stock. We currently anticipate that we will retain all available funds and future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. As a result, capital appreciation, if any, of our common stock will be your sole source of gain on an investment in our common stock for the foreseeable future. See "Dividend Policy" for additional information.

Our ability to use our net operating losses and research and development tax credits to offset future taxable income or income tax liabilities may be subject to certain limitations.

As of December 31, 2020, we had U.S. federal and state net operating loss carryforwards, or NOLs, of $212.5 million and $106.7 million, respectively, which may be available to offset future taxable income, if any, that begin to expire in 2027 and 2025, respectively. Additionally, we had federal NOLs of $78.2 million which do not expire but are (for taxable years beginning after December 31, 2020) generally limited in their usage to an annual deduction equal to 80% of taxable income. In addition, we had federal and state research and development tax credits of $3.1 million and $2.0 million, respectively, which may be available to offset future tax liabilities and begin to expire in 2028 and 2024, respectively. In general, under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, or the Code, a corporation that undergoes an "ownership change," generally defined as a greater than 50 percentage point change by value in its equity ownership by one or more stockholders or groups of stockholders owning at least 5% of the corporation's stock over a rolling three-year period, is subject to limitations on its ability to utilize its pre-ownership change NOLs and tax credits to offset future taxable income or income tax liabilities for U.S. federal income tax purposes. Similar rules may apply under state tax laws. Our existing NOLs and tax credits may be subject to limitations arising from previous ownership changes. Future changes in our stock ownership, including as a result of this offering, some of which might be beyond our control, could result in ownership changes. For these reasons, we may not be able to utilize a material portion of the NOLs and tax credits even if we attain profitability.

General risk factors

Changes in tax laws, including as a result of the 2020 United States presidential and congressional elections, may impact our future financial position and results of operations.

New income, sales, use or other tax laws, statutes, rules, regulations or ordinances could be enacted at any time, or interpreted, changed, modified or applied adversely to us, any of which could adversely affect our business operations and financial performance. In particular, the recent presidential and congressional elections in the United States could result in significant changes in, and uncertainty with respect to, tax legislation, regulation and government policy directly affecting our business or indirectly affecting us because of impacts on our customers and suppliers. For example, the United States government may enact significant changes to the taxation of business entities including, among others, a permanent increase in the corporate income tax rate, an increase in the tax rate applicable to the global intangible low-taxed income and elimination of certain exemptions, and the imposition of minimum taxes or surtaxes on certain types of income. The likelihood of these changes being enacted or implemented is unclear. We are currently unable to predict whether such changes will occur and, if so, the ultimate impact on our business. To the extent that such changes have a negative impact on us, our suppliers or our customers, including as a result of related uncertainty, these changes may materially and adversely impact our business, financial condition, results of operations and cash flows.

If securities or industry analysts do not publish research or reports about our business, or if they issue an adverse or misleading opinion regarding our stock, our stock price and trading volume could decline, even if our business is doing well.

The trading market for our Class A common stock will be influenced by the research and reports that industry or securities analysts publish about us or our business. We do not currently have, and may never obtain, research coverage by securities and industry analysts. If no or few securities or industry analysts commence coverage of us, the trading price for our stock would be negatively impacted. In the event we obtain securities or industry analyst coverage, if the analysts who cover us issue an adverse or misleading opinion regarding us, our business model, or our stock performance, or if our product development or marketing and sales results fail to meet the expectations of analysts, our stock price would likely decline. If one or more of these analysts ceases coverage of us or fails to publish reports on us regularly, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

If our estimates or judgments relating to our critical accounting policies are based on assumptions that change or prove to be incorrect, our operating results could fall below our publicly announced guidance or the expectations of securities analysts and investors, resulting in a decline in the market price of our Class A common stock.

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the amounts reported in our consolidated financial statements and accompanying notes. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets, liabilities, equity, revenue and expenses that are not readily apparent from other sources. If our assumptions change or if actual circumstances differ from our assumptions, our operating results may be adversely affected and could fall below our publicly announced guidance or the expectations of securities analysts and investors, resulting in a decline in the market price of our Class A common stock.

We could be subject to securities class action litigation.

In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for us because early-stage technology companies have experienced significant stock price volatility in recent years. If we face such litigation, it could result in substantial costs and a diversion of management's attention and resources, which could harm our business.

We will incur increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives and corporate governance practices.

As a public company, and particularly after we are no longer an emerging growth company and a non-accelerated filer, we will incur significant legal, accounting and other expenses that we did not incur as a private company. The Sarbanes-Oxley Act of 2002, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the listing requirements of The Nasdaq Global Market and other applicable securities rules and regulations impose various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel will need to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations will increase our legal and financial compliance costs and will make some activities more time consuming and costly. For example, we expect that these rules and regulations may make it more difficult and more expensive for us to obtain director and officer liability insurance, which in turn could make it more difficult for us to attract and retain qualified members of our board of directors.

We are evaluating these rules and regulations and cannot predict or estimate the amount of additional costs we may incur or the timing of such costs. These rules and regulations are often subject to varying interpretations, in many cases due to their lack of specificity, and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. This could result in continuing uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices.

Special note regarding forward-looking statements

This prospectus contains forward-looking statements. All statements other than statements of historical facts contained in this prospectus, including statements regarding our future results of operations and financial position, business strategy, prospective products, product approvals, research and development costs, future revenue, timing and likelihood of success, plans and objectives of management for future operations, future results of anticipated products and prospects, plans and objectives of management, are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements.

In some cases, you can identify forward-looking statements by terms such as “may,” “will,” “should,” “expect,” “plan,” “anticipate,” “could,” “intend,” “target,” “project,” “contemplate,” “believe,” “estimate,” “predict,” “potential,” “would” or “continue” or the negative of these terms or other similar expressions, although not all forward-looking statements contain these words. The forward-looking statements in this prospectus are only predictions and are based largely on our current expectations and projections about future events and financial trends that we believe may affect our business, financial condition and results of operations. These forward-looking statements speak only as of the date of this prospectus and are subject to a number of known and unknown risks, uncertainties and assumptions, including those described under the sections in this prospectus entitled “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and elsewhere in this prospectus. Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified and some of which are beyond our control, you should not rely on these forward-looking statements as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in the forward-looking statements. Moreover, we operate in an evolving environment. New risk factors and uncertainties may emerge from time to time, and it is not possible for management to predict all risk factors and uncertainties. Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise. The forward-looking statements contained in this prospectus are excluded from the safe harbor protection provided by the Private Securities Litigation Reform Act of 1995 and Section 27A of the Securities Act of 1933, as amended.

Market and industry data

We obtained the industry, market and competitive position data in this prospectus from our own internal estimates and research as well as from industry and general publications and research, surveys and studies conducted by third parties. Industry publications, studies and surveys generally state that they have been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. Management’s estimates are derived from publicly available information, their knowledge of our industry and their assumptions based on such information and knowledge, which we believe to be reasonable. This data involves a number of assumptions and limitations which are necessarily subject to a high degree of uncertainty and risk due to a variety of factors, including those described in “Risk Factors.” These and other factors could cause our future performance to differ materially from our assumptions and estimates.

Use of proceeds

We estimate that the net proceeds to us from our issuance and sale of shares of our Class A common stock in this offering will be approximately $ million, assuming an initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. If the underwriters' option to purchase additional shares from us is exercised in full, we estimate that our net proceeds will be approximately $ million.

Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the net proceeds to us from this offering by approximately $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus remains the same and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Each increase (decrease) of 1.0 million in the number of shares we are offering would increase (decrease) the net proceeds to us from this offering, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, by $ million, assuming the assumed initial public offering price stays the same.

We anticipate that we will use the net proceeds of this offering, together with our existing cash and cash equivalents, for the following purposes:

- approximately $ million for the expansion of our commercial resources and capabilities, including sales and marketing;
- approximately $ million for research and development of our current products and new products, including the exploitation of new pipeline opportunities;
- approximately $ million to expand our operations globally; and
- the remainder for working capital and other general corporate purposes.

This expected use of the net proceeds from this offering represents our intentions based upon our current plans and business conditions, which could change in the future as our plans and business conditions evolve. We may also use a portion of the net proceeds to in-license, acquire, or invest in additional businesses, technologies, products or assets, although currently we have no specific agreements, commitments or understandings in this regard. As of the date of this prospectus, we cannot predict with certainty the specific allocations or all of the particular uses for the net proceeds to be received upon completion of this offering or the amounts that we will actually spend on the uses set forth above. Predicting the cost necessary to develop products can be difficult and we anticipate that we will need additional funds to complete the development of any product. The amounts and timing of our actual expenditures and the extent of development may vary significantly depending on numerous factors, including the growth of the market for automated MQC testing, the progress of our development and commercialization efforts, the timing and costs associated with the manufacture and supply of our products, as well as any collaborations that we may enter into with third parties for our products and any unforeseen cash needs As a result, our management will retain broad discretion in the application and specific allocations of the net proceeds from this offering.

Based on our planned use of the net proceeds from this offering and our existing cash and cash equivalents and short-term investments, we estimate that such funds will be sufficient to enable us to fund our operating expenses and capital expenditure requirements . We have based this estimate on assumptions that may prove to be incorrect, and we could use our available capital resources sooner than we currently expect. We may satisfy our future cash needs through the sale of equity securities and debt financings, or a combination of one or more of these sources.

Pending our use of the net proceeds from this offering, we intend to invest the net proceeds in a variety of capital preservation investments, including short-term and intermediate-term, investment-grade, interest-bearing instruments and U.S. government securities.

Dividend policy

We have never declared or paid any cash dividends on our capital stock. We currently intend to retain all available funds and future earnings, if any, for the operation and expansion of our business and do not anticipate declaring or paying any dividends in the foreseeable future. Any future determination related to our dividend policy will be made at the discretion of our board of directors after considering our financial condition, results of operations, capital requirements, contractual requirements, business prospects and other factors the board of directors deems relevant, and subject to the restrictions contained in any future financing instruments. In addition, our ability to pay cash dividends is currently restricted by the terms of the loan and security agreement governing our term loan facility.

Capitalization

The following table sets forth our cash and cash equivalents and capitalization as of March 31, 2021, as follows:

- on an actual basis;
- on a pro forma basis to reflect:
  - the automatic conversion of all outstanding shares of our Series A1, B1, C1 and D1 preferred stock into 121,004,726 shares of Class A common stock upon the closing of this offering;
  - the automatic conversion of all outstanding shares of our Series C2 and D2 preferred stock into 34,516,907 shares of Class B common stock upon the closing of this offering;
  - all warrants to purchase redeemable convertible preferred stock becoming warrants to purchase Class A common stock;
  - the filing and effectiveness of our current certificate of incorporation effecting a reclassification of our then outstanding common stock to Class A common stock and authorizing our Class B common stock and the issuance to ABG WTT of 11,437,301 shares of Series C1 preferred stock for an equal number of shares of Series C2 preferred stock and to Ally Bridge MedAlpha of 2,364,509 shares of Series D1 preferred stock in exchange for an equal number of shares of Series D2 preferred stock pursuant to an exchange agreement, in each case, in June 2021; and
  - the filing and effectiveness of our restated certificate of incorporation which will occur upon the closing of this offering.
- on a pro forma as adjusted basis to give further effect to (i) the pro forma adjustments described above and (ii) our issuance and sale of shares of Class A common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

Our capitalization following the closing of this offering will be adjusted based on the actual initial public offering price and other terms of this offering determined at pricing. You should read this information in conjunction with our consolidated financial statements and the related notes appearing at the end of this prospectus and the “Use of Proceeds” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” sections and other financial information contained in this prospectus.

	As of March 31, 2021		
	(in thousands, except share data)		
	Actual	Pro Forma (unaudited)	Pro Forma As Adjusted(1) (unaudited)
Cash and cash equivalents and short-term investments	$ 113,635	$ 113,635	$
Notes payable, net of unamortized discount	$ 24,884	$ 24,884	$
Preferred stock warrant liability	15,565	—	
Redeemable convertible preferred stock (Series A1, B1, C1, C2, D1 and D2), par value $0.01 per share; shares authorized, shares issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted	233,832	—	
Stockholders' equity (deficit):			
Common stock, par value $0.01 per share; 200,000,000 shares authorized, 4,646,252 shares issued and outstanding, actual; no shares authorized, pro forma and pro forma as adjusted; no shares issued and outstanding, pro forma and pro forma as adjusted	46	—	
Class A Common stock, par value $0.01 per share; no shares authorized, issued and outstanding, actual; 200,000,000 shares authorized, pro forma and pro forma as adjusted; 125,650,978 shares issued and outstanding, pro forma; shares issued and outstanding, pro forma as adjusted	—	1,257	
Class B Common stock, par value $0.01 per share; no shares authorized, issued and outstanding, actual; 34,516,907 shares authorized, pro forma and pro forma as adjusted; 34,516,907 shares issued and outstanding, pro forma; 34,516,907 shares issued and outstanding, pro forma as adjusted	—	345	
Preferred stock, par value $0.01 per share; no shares authorized, issued and outstanding, actual; shares authorized pro forma and pro forma as adjusted; no shares issued and outstanding, pro forma and pro forma as adjusted	—	—	
Additional paid in capital	112,595	360,436	
Accumulated deficit	(263,689)	(263,689)	
Accumulated other comprehensive income	1	1	
Total stockholders' equity (deficit)	(151,047)	98,350	
Total capitalization	$ 123,234	$ 123,234	$

(1) Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, additional paid in capital, total stockholders' equity (deficit) and total capitalization by $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase (decrease) of 1.0 million shares in the number of shares offered by us at the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, additional paid in capital, total stockholders' equity (deficit) and total capitalization by approximately $ million.

The number of shares in the table above is based on 4,646,252 shares of Class A common stock outstanding as of March 31, 2021 (which includes 1,244,515 shares of unvested restricted stock subject to repurchase and no shares of our Class B common stock outstanding as of March 31, 2021) and excludes:

- 21,066,600 shares of Class A common stock issuable upon the exercise of stock options outstanding, pursuant to the 2010 Plan, as of March 31, 2021, at a weighted-average exercise price of $0.48 per share;
- 2,220,400 shares of Class A common stock issuable upon the exercise of stock options granted after March 31, 2021 pursuant to the 2010 Plan at a weighted-average exercise price of $2.42 per share;

- 279,340 shares of our Class A common stock issuable upon the exercise of warrants to purchase Class A common stock outstanding as of March 31, 2021, at a weighted average exercise price of $27.44 per share;
- 3,823,524 shares of our Class A common stock issuable upon the conversion of shares of our Series A1 preferred stock issuable upon the exercise of warrants to purchase our Series A1 preferred stock outstanding as of March 31, 2021 at an exercise price (on an as-converted basis) of $0.01 per share;
- 1,199,994 shares of our Class A common stock issuable upon the conversion of shares of our Series B1 preferred stock issuable upon the exercise of warrants to purchase our Series B1 preferred stock outstanding as of March 31, 2021 at an exercise price (on an as-converted basis) of $0.01 per share;
- 1,195,652 shares of our Class A common stock issuable upon the conversion of shares of our Series C1 preferred stock issuable upon the exercise of warrants to purchase our Series C1 preferred stock outstanding as of March 31, 2021 at an exercise price (on an as-converted basis) of $1.15 per share;
- additional shares of our Class A common stock reserved for future issuance under our 2021 Plan, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of our Class A common stock reserved for future issuance under the 2021 Plan; and
- shares of our Class A common stock that will become available for future issuance under our 2021 ESPP, which will become effective in connection with this offering, and shares of our Class A common stock that become available pursuant to provisions in the 2021 ESPP that automatically increase the share reserve under the 2021 ESPP.

Dilution

If you invest in our Class A common stock in this offering, your ownership interest will be immediately diluted to the extent of the difference between the initial public offering price per share of our Class A common stock and the pro forma as adjusted net tangible book value per share of our common stock after this offering.

As of March 31, 2021, we had a historical net tangible book value (deficit) of $(152.4) million, or $(32.79) per share of common stock. Our historical net tangible book value (deficit) per share represents total tangible assets less total liabilities and less the carrying value of our redeemable convertible preferred stock, which is not included within stockholders' deficit, divided by 4,646,252 shares of our common stock outstanding as of March 31, 2021.

Our pro forma net tangible book value as of March 31, 2021 was $97.0 million, or $0.61 per share. Pro forma net tangible book value represents the amount of our total tangible assets less total liabilities, after giving effect to (i) the filing and effectiveness of our current certificate of incorporation effecting a reclassification of our then outstanding common stock to Class A common stock and authorizing our Class B common stock and the issuance to ABG WTT of 11,437,301 shares of Series C1 preferred stock for an equal number of shares of Series C2 preferred stock and to Ally Bridge MedAlpha of 2,364,509 shares of Series D1 preferred stock in exchange for an equal number of shares of Series D2 preferred stock pursuant to an exchange agreement, in each case, in June 2021; (ii) the automatic conversion of all shares of our outstanding Series A1, B1, C1 and D1 preferred stock into an aggregate of 121,004,726 shares of our Class A common stock, (iii) the automatic conversion of all shares of our outstanding Series C2 and D2 preferred stock into an aggregate of 34,516,907 shares of our Class B common stock and (iv) all warrants to purchase redeemable convertible preferred stock becoming warrants to purchase Class A common stock, in connection with this offering. Pro forma net tangible book value per share represents our pro forma net tangible book value divided by the total number of shares outstanding as of March 31, 2021, after giving effect to the pro forma adjustment described above.

After giving further effect to receipt of the net proceeds from our issuance and the sale of shares of Class A common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma as adjusted net tangible book value as of March 31, 2021 would have been approximately $ million, or approximately $ per share. This amount represents an immediate increase in pro forma net tangible book value of $ per share to our existing stockholders and an immediate dilution of approximately $ per share to new investors participating in this offering. We determine dilution by subtracting the pro forma as adjusted net tangible book value per share after this offering from the amount of cash that a new investor paid for a share of Class A common stock. The following table illustrates this dilution:

Assumed initial public offering price per share	$
Historical net tangible book value (deficit) per share as of March 31, 2021	$(32.79)
Increase in historical net tangible book value per share attributable to the conversion of our preferred stock	33.40
Pro forma net tangible book value (deficit) per share as of March 31, 2021	0.61
Increase in pro forma net tangible book value per share attributable to this offering	
Pro forma as adjusted net tangible book value per share after this offering	$
Dilution per share to new investors in this offering	$

Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted net tangible book value per share after this offering by $ million, and dilution in pro forma net tangible book value per share to new investors by $, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting

discounts and commissions and estimated offering expenses payable by us. Each increase (decrease) of 1.0 million shares in the number of shares offered by us would increase (decrease) our pro forma as adjusted net tangible book value per share after this offering by $ per share and decrease (increase) the dilution to new investors by $ per share, assuming that the assumed initial public offering price remains the same, and after deducting the estimated underwriting discounts and commissions and the estimated offering expenses payable by us.

If the underwriters exercise their option to purchase additional shares of our Class A common stock in full, the pro forma as adjusted net tangible book value after this offering would be $ per share, the increase in pro forma net tangible book value per share would be $ and the dilution per share to new investors would be $ per share, in each case assuming an initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, and after deducting the estimated underwriting discounts and commissions and the estimated offering expenses payable by us.

The following table summarizes on the pro forma as adjusted basis described above, as of March 31, 2021, the differences between the number of shares purchased from us, the total consideration paid to us in cash and the average price per share that existing stockholders and new investors paid. The calculation below is based on an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, before deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

	Shares Purchased		Total Consideration		Average Price Per Share
	Number	Percent	Amount	Percent	
Existing stockholders		%	$	%	$
New investors					
Total		100.0%		100.0%	$

The table above assumes no exercise of the underwriters' option to purchase additional shares of Class A common stock in this offering. If the underwriters' option to purchase additional shares of Class A common stock is exercised in full, the number of shares of our common stock held by existing shareholders would be reduced to % of the total number of shares of our common stock outstanding after this offering, and the number of shares of common stock held by new investors participating in this offering would be increased to % of the total number of shares outstanding after this offering.

A $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase or decrease the total consideration paid by new investors by $ million and, in the case of an increase, would increase the percentage of total consideration paid by new investors by percentage points and, in the case of a decrease, would decrease the percentage of total consideration paid by new investors by percentage points, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same. An increase or decrease of 1.0 million shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase or decrease the total consideration paid by new investors by $ million and, in the case of an increase, would increase the percentage of total consideration paid by new investors by percentage points and, in the case of a decrease, would decrease the percentage of total consideration paid by new investors by percentage points, assuming no change in the assumed initial public offering price.

In addition, to the extent any outstanding stock options are exercised, outstanding warrants are exercised or other rights are exercised, or we issue additional equity or convertible securities in the future, investors participating in this offering will experience further dilution.

The foregoing tables and calculations are based on 4,646,252 shares of our Class A common stock outstanding as of March 31, 2021 (which includes 1,244,515 shares of unvested restricted stock subject to repurchase) and no shares of our Class B common stock outstanding as of March 31, 2021, and exclude:

- 21,066,600 shares of Class A common stock issuable upon exercise of stock options outstanding, pursuant to the 2010 Plan, as of March 31, 2021, at a weighted-average exercise price of $0.48 per share;
- 2,220,400 shares of Class A common stock issuable upon the exercise of stock options granted after March 31, 2021 pursuant to the 2010 Plan at a weighted-average exercise price of $2.42 per share;
- 279,340 shares of our Class A common stock issuable upon the exercise of warrants to purchase Class A common stock outstanding as of March 31, 2021, at a weighted average exercise price of $27.44 per share;
- 3,823,524 shares of our Class A common stock issuable upon the conversion of shares of our Series A1 preferred stock issuable upon the exercise of warrants to purchase our Series A1 preferred stock outstanding as of March 31, 2021 at an exercise price (on an as-converted basis) of $0.01 per share;
- 1,199,994 shares of our Class A common stock issuable upon the conversion of shares of our Series B1 preferred stock issuable upon the exercise of warrants to purchase our Series B1 preferred stock outstanding as of March 31, 2021 at an exercise price (on an as-converted basis) of $0.01 per share;
- 1,195,652 shares of our Class A common stock issuable upon the conversion of shares of our Series C1 preferred stock issuable upon the exercise of warrants to purchase our Series C1 preferred stock outstanding as of March 31, 2021 at an exercise price (on an as-converted basis) of $1.15 per share;
- additional shares of our Class A common stock reserved for future issuance under our 2021 Plan, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of our Class A common stock reserved for future issuance under the 2021 Plan; and
- shares of our Class A common stock that will become available for future issuance under our 2021 ESPP, which will become effective in connection with this offering, and shares of our Class A common stock that become available pursuant to provisions in the 2021 ESPP that automatically increase the share reserve under the 2021 ESPP.

Management's discussion and analysis of financial condition and results of operations

You should read the following discussion and analysis of our financial condition and results of operations together with our consolidated financial statements and the related notes appearing at the end of this prospectus. Some of the information contained in this discussion and analysis or set forth elsewhere in this prospectus, including information with respect to our plans and strategy for our business and related financing, includes forward-looking statements that involve risks and uncertainties. As a result of many factors, including those factors set forth in the "Risk Factors" section of this prospectus, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

We are an innovative life sciences technology company that enables the safe and efficient manufacture of pharmaceutical products through our rapid automated MQC detection platform. We develop, manufacture, market and sell the Growth Direct system and related proprietary consumables, and value-added services to enable rapid MQC testing in the manufacture of biologics, cell and gene therapies, vaccines, sterile injectables, and other healthcare products. Our system delivers the power of industrial automation to bioprocessing and pharmaceutical manufacturing firms by modernizing and digitizing their MQC operations. Our Growth Direct platform, developed with over 15 years of active feedback from our customers, was purpose-built to meet the growing demands posed by the increasing scale, complexity, and regulatory scrutiny confronting global pharmaceutical manufacturing. Our Growth Direct platform comprises the Growth Direct system, optional laboratory information management system, or LIMS, connection software (which the majority of our customers purchase), proprietary consumables, and comprehensive field service, validation services and post-warranty service contracts. Once embedded and validated in our customers' facilities, our Growth Direct platform provides for recurring revenues through ongoing sales of consumables and service contracts.

Our technology fully automates and digitizes the process of pharmaceutical MQC and is designed to enable our customers to perform this critical testing process more efficiently, accurately, and securely. Our Growth Direct platform accelerates time to results by several days, a 50% improvement over the traditional method, and reduces MQC testing to a simple two-step workflow, eliminating 85% of the manual steps of traditional MQC, generating significant time, operational, and cost savings for our customers. We seek to establish the Growth Direct as the trusted global standard in automated MQC by delivering the speed, accuracy, security, and data integrity compliance that our customers depend on to ensure patient safety and consistent drug supply.

Since inception, we have devoted a majority of our resources to designing, developing, and building our proprietary Growth Direct platform and associated products, launching our Growth Direct platform commercially, expanding our sales and marketing infrastructure to grow our sales, building a global customer support team to deliver our value-added services, investing in robust manufacturing and supply chain operations to serve our customers globally, and providing general and administrative support for these operations. To date, we have funded our operations primarily with proceeds from sales of preferred stock, borrowings under loan agreements and product and service sales as well as our cost-reimbursement contract with the U.S. Department of Health and Human Services Biomedical Advanced Research & Development Authority, or BARDA.

Since our inception, we have incurred net losses in each year. We generated revenue of $16.5 million and $16.1 million for the years ended December 31, 2019 and 2020, respectively, and incurred net losses of $21.2 million and $37.1 million for those same years. We generated revenue of $5.0 million and incurred a net loss of $22.1 million for the three months ended March 31, 2021. As of March 31, 2021, we had an accumulated deficit of $263.7 million. We expect to continue to incur net losses in connection with our ongoing activities, including:

- growing sales of our products in both the United States and international markets by further expanding our sales and marketing capabilities;

- scaling our manufacturing and supply chain processes and infrastructure to meet growing demand for our products;
- investing in research and development to develop new products and further enhance our existing products;
- protecting and building on our intellectual property portfolio; and
- attracting, hiring and retaining qualified personnel.

Until such time as we can generate revenue sufficient to achieve profitability, we expect to finance our operations through a combination of equity offerings and debt financings. If we are unable to raise capital or enter into such agreements as, and when, needed, we may have to significantly delay, scale back or discontinue our expansion plans including the further development and commercialization efforts of one or more of our products, or may be forced to reduce or terminate our operations.

We believe that the net proceeds from this offering, together with our existing cash, cash equivalents and short-term investments will enable us to fund our operating expenses and capital expenditure requirements. We have based this estimate on assumptions that may prove to be wrong, and we could exhaust our available capital resources sooner than we expect. See “Liquidity and Capital Resources.”

COVID-19 update

In response to the COVID-19 pandemic and various resulting government directives, we took proactive measures to protect the health and safety of our employees, customers, and partners, while maintaining our ability to supply and service our customers. We continue to monitor the implications of the COVID-19 pandemic on our business, as well as our customers’ and suppliers’ businesses. Some of the measures we have taken follow:

- During this pandemic, we moved quickly to implement several business continuity initiatives aimed at maintaining uninterrupted manufacturing and supply capabilities while keeping our workforce safe, including instituting a COVID-19 task force, forming multiple manufacturing teams with staggered shifts, increasing inventory safety stock levels, and establishing appropriate protective equipment and distancing policies for essential on-site personnel.
- We have been designated an essential business that can continue operations during the COVID-19 pandemic. In early March 2020, we promptly instituted protocols to have many personnel work remotely. At the same time, because of our continued designation as an essential business, many employees continue to work on-site at our facility in Lowell, MA to undertake manufacturing activities that support essential operations to provide mission-critical MQC testing products to global pharmaceutical customers manufacturing life-saving drugs. We have also restricted business travel and have limited access to our facilities to outside visitors other than vendors, suppliers and partners who are integral to supporting our business. To date, these arrangements have not materially affected our ability to maintain our business operations, including the operation of financial reporting systems, internal control over financial reporting and disclosure controls and procedures.
- Our production, shipping and customer service functions remain operational to maintain a continuous supply of products to our customers. We are communicating regularly with our suppliers and logistics partners so that our supply chain remains intact and we have not experienced any material supply issues to date. Our customer service teams around the world are operating remotely and remain available to assist our customers and partners as needed.
- As a result of travel restrictions and shelter-in-place orders, we experienced an impact on our ability to ship, install and validate systems, as well as train customers in certain geographies, which negatively impacted our product and service revenues during 2020 and 2021. Despite these restrictions, we were able to implement several measures including remote and customer-assisted support activities to support the continued growth of our business.
- We are actively reviewing and managing costs to navigate the current environment. However, to date, the COVID-19 pandemic has not had a material adverse effect on results of operations.

While the disruption due to COVID-19 is currently expected to be temporary, there is considerable uncertainty around its duration. We expect these disruptions to continue to impact our operating results. However, the related financial impact and duration of these disruptions cannot be reasonably estimated at this time.

Factors affecting our performance

We believe that our financial performance has been, and in the foreseeable future will continue to be, primarily driven by multiple factors as described below, each of which presents growth opportunities for our business. These factors also pose important challenges that we must successfully address in order to sustain our growth and improve our results of operations. Our ability to successfully address these challenges is subject to various risks and uncertainties, including those described under the heading “Risk Factors.”

New customer adoption of the Growth Direct platform

Our financial performance has largely been driven by, and a key factor to our future success will be, our ability to increase the global adoption of our Growth Direct platform in our key markets. We plan to drive global customer adoption through both direct and indirect sales and marketing organizations in North America, Europe, and Asia. We are investing substantially in these organizations and expect to continue to do so in the future. As part of this effort, we increased our direct sales and marketing team by 23% in the year ended December 31, 2020 compared to the prior year-end.

Expansion within our existing customer base

There is an opportunity to increase broader adoption and utilization of our Growth Direct platform throughout our existing customers’ organizations by their purchasing of more systems to convert more of their test volume at existing locations, to support multiple locations, to meet redundancy requirements, or driven by a need to increase capacity. As of March 31, 2021, approximately 50% of our customers have purchased Growth Direct systems for multiple sites, and approximately 60% of our customers have purchased multiple Growth Direct systems. Increased utilization amongst existing customers can also occur as customers advance through the Growth Direct platform adoption cycle from early validation of initial applications to validation and conversion of multiple applications on the Growth Direct platform.

Innovating and launching new products on the Growth Direct platform

We believe the depth, scalability and robust capabilities of our Growth Direct platform allow us to address key opportunities and challenges facing MQC testing in the pharmaceutical industry. As an innovative leader in automated MQC testing, we intend to invest in further enhancements in our existing Growth Direct platform as well as end-to-end workflow solutions in our core market. We plan to further invest in research and development to support the expansion of our Growth Direct platform through development and launch of new applications to capture greater share of customer testing volume, new product formats to broaden our ability to serve different market segments and launch of new products and technologies to address adjacent segments of the overall MQC workflow. We plan to continue to hire employees with the necessary scientific and technical backgrounds to enhance our existing products and help us introduce new products to market. We expect to incur additional research and development expenses as a result. By expanding and continuously enhancing the Growth Direct platform, we believe we can drive incremental revenue from existing clients as well as broaden the appeal of our solutions to potential new customers.

Expanding Growth Direct into adjacent end markets

We have identified adjacent end markets that conduct high volumes of MQC testing under regulatory control and derive value from improving operational efficiency via MQC automation and we may opportunistically enter these markets. We could expand into these markets through our existing technologies, through adapting our existing technologies, or through developing new products to specifically address the unmet needs of these adjacent markets. We may drive our expansion into these markets by building commercial infrastructure to specifically target customers in those markets, or by partnering with other participants in those markets.

Revenue mix

Our revenue is derived from sales of our Growth Direct systems, our LIMS connection software, proprietary consumables, services and our cost-reimbursement contract with BARDA. During the years ended December 31, 2019 and 2020 and the three months ended March 31, 2020 and 2021, Growth Direct system revenue was the single largest component of our revenue. Because Growth Direct system revenue involves a capital selling process and tends to be somewhat concentrated within a small (but different) group of customers each year, it is subject to variability from quarter to quarter. While we expect Growth Direct systems revenue to continue to be the largest contributor to our revenue over the near- to mid-term, as our base of validated Growth Direct systems continues to grow, we expect our recurring revenue (consumables and service contracts) to grow at a faster rate than our non-recurring revenues (Growth Direct systems, validation and other services), which we expect to drive variability and longer-term trends in our revenue mix.

Our non-commercial revenue is generated from long-term contracts with governmental agencies and third parties that are typically fixed in terms of scope and value. As a result, the amount of non-commercial revenue recognized in each period is subject to variability depending on factors such as the number of active contracts as well as the work performed and value remaining under each contract.

Key business metrics

We regularly review the following key business metrics to evaluate our business, measure our performance, identify trends affecting our business, formulate financial projections and make strategic decisions. We believe that the following metrics are representative of our current business; however, we anticipate these may change or be substituted for additional or different metrics as our business grows and evolves.

	Year Ended December 31,		Change	
	2019	2020	Amount	%
	(dollars in thousands)			
Systems placed:				
Systems placed in period	25	26	1	4.0%
Cumulative systems placed	61	87	26	42.6%
Systems validated:				
Systems validated in period	15	24	9	60.0%
Cumulative systems validated	27	51	24	88.9%
Product and service revenue — total	$11,456	$14,083	$ 2,627	22.9%
Product and service revenue — recurring	$ 2,294	$ 3,908	$ 1,614	70.4%

	Three Months Ended March 31,		Change	
	2020	2021	Amount	%
	(dollars in thousands)			
Systems placed:				
Systems placed in period	2	8	6	300.0%
Cumulative systems placed	63	95	32	50.8%
Systems validated:				
Systems validated in period	4	1	(3)	-75.0%
Cumulative systems validated	31	52	21	67.7%
Product and service revenue — total	$ 1,598	$ 4,785	$ 3,187	199.4%
Product and service revenue — recurring	$ 859	$ 1,606	$ 747	87.0%

Growth Direct system placements

We consider a Growth Direct system to be "placed" upon transfer of control of the system to the customer, at which point the revenue for that system is recognized. We regularly review the number of Growth Direct systems placed and cumulative Growth Direct system placements in each period as a leading indicator of our business performance. Our revenue has historically been driven by, and in the future will continue to be impacted by, the rate of Growth Direct system placements as a reflection of our success selling and delivering our products. We expect our Growth Direct system placements to continue to grow over time as we increase penetration in our existing markets and expand into new markets.

The number of Growth Direct system placements and rate of growth varies from period-to-period due to factors including, but not limited to, Growth Direct system order volume and timing, and access to customer sites (including COVID-19 related restrictions). As a result, we expect to experience continued variability in our period-to-period number of Growth Direct system placements due to the aforementioned factors.

Validated systems

We regularly review the number of Growth Direct systems validated and cumulative Growth Direct systems validated in each period as indicators of our business performance. Management focuses on validated Growth Direct systems as a leading indicator of likely future recurring revenue as well as a reflection of our success validating placed systems. We expect our validated Growth Direct systems to continue to grow over time as we increase our base of cumulative systems placed and then validate those systems. After a Growth Direct system is placed with a customer and installed, we work with the customer to validate the system, which typically takes anywhere from three to nine months. Once a validation has been completed, we generally expect our customers to transition from their legacy manual method to our automated method and begin regular utilization of consumables over a period of up to three months.

The number of validated Growth Direct systems and rate of growth varies from period-to-period due to factors including, but not limited to, Growth Direct system order volume and timing, whether customers have previously validated Growth Direct systems within their site or network, access to customer sites (including as a result of COVID-19 related restrictions and delays in 2020 and 2021), customer site readiness and the time to install and validate each individual system. As a result, we expect to experience continued fluctuations in our period-to-period number of Growth Direct systems validated due to the aforementioned factors.

Product and service revenue

We regularly assess trends relating to our combined product and service revenue as an indicator of our business performance. Product and service revenue represents all of our commercial revenue for the business. It excludes non-commercial revenue, which typically supports other business functions such as research and development and is by its nature subject to significant variability.

During the year ended December 31, 2020 and the three months ended March 31, 2021, travel restrictions and shelter-in-place orders related to COVID-19 negatively impacted our ability to ship, install and validate Systems, as well as train customers in certain geographies. This negatively impacted our product and service revenue in the year. While we expect these disruptions to continue to impact our operating results, the related financial impact and duration of these disruptions cannot be reasonably estimated at this time.

Recurring revenue

We regularly assess trends relating to recurring revenue, which is the revenue from consumables and service contracts, based on our product offerings, our customer base and our understanding of how our customers use our products. Recurring revenue was 13.9% and 24.3% of our total revenue for the years ended December 31, 2019 and 2020, respectively. Recurring revenue was 28.6% and 32.2% of our total revenue for the three months ended March 31, 2020 and 2021, respectively. Our recurring revenue as a percentage of the total product and service revenue will generally vary based upon the cumulative number of validated Growth Direct systems

in the period, as well as other variables such as the volume of tests being conducted, and the test application(s) being used on those Growth Direct systems. As our base of validated systems continues to grow, we expect our recurring revenue streams to grow at a faster rate that will ultimately result in them constituting the majority of our revenue over the longer term.

Components of results of operations

Revenue

We generate revenue from sales of our Growth Direct system (including our LIMS connection software), consumables, validation services, service contracts and field service as well as our contractual arrangement with BARDA. We primarily sell our products and services through direct sales representatives. The arrangements are generally noncancelable and nonrefundable after ownership passes to the customer.

	Year Ended December 31, 2019	Percentage of total revenue	Year Ended December 31, 2020	Percentage of total revenue
	(in thousands)		(in thousands)	
Product revenue	$ 9,328	56.5%	$ 10,992	68.4%
Service revenue	2,128	12.9%	3,091	19.2%
Non-commercial revenue	5,056	30.6%	1,994	12.4%
Total revenue	$ 16,512	100.0%	$ 16,077	100.0%

	Three Months Ended March 31, 2020	Percentage of total revenue	Three Months Ended March 31, 2021	Percentage of total revenue
	(in thousands)		(in thousands)	
Product revenue	$ 1,188	39.6%	$ 3,718	74.4%
Service revenue	410	13.7%	1,067	21.4%
Non-commercial revenue	1,401	46.7%	210	4.2%
Total revenue	$ 2,999	100.0%	$ 4,995	100.0%

Product revenue

We derive product revenue primarily from the sale of our Growth Direct systems and related consumables as well as our LIMS connection software, which the majority of our customers purchase. As of March 31, 2021, we had sold over 100 Growth Direct systems to over thirty customers globally, including over half of the top twenty pharmaceutical companies as measured by revenue and 30% of globally approved cell and gene therapies.

Growth Direct systems

Growth Direct system revenue is a non-recurring product revenue stream that we recognize as revenue upon transfer of control of the system to the customer. The Growth Direct system is fully functional for use by the customer upon delivery, as such transfer of control occurs at shipment or delivery, depending on contractual terms. We expect our Growth Direct system revenue to continue to grow over time as we increase system placements in our existing customers and markets and expand into new customers and markets.

Consumables

Our consumable revenue is a recurring product revenue stream composed of two proprietary consumables to capture test samples for analysis on the Growth Direct system, an Environmental Monitoring or EM, consumable, and a Water/Bioburden consumable, or W/BB consumable. Both proprietary consumables support the growth-based compendial method for MQC testing mandated by global regulators and provide results that are comparable

to traditional consumables. Our consumables are designed with features that enable automation on the Growth Direct system, with bar coding for tracking and data integrity, and physical characteristics for robotic handling, to support vision detection, and to prevent counterfeiting.

We expect consumable revenue to increase in future periods as our base of cumulative validated Growth Direct systems grows and those systems utilize our consumables on a recurring, ongoing basis.

LIMS Connection Software

Our LIMS connection software is a non-recurring product revenue stream. Although optional, the majority of our customers elect to purchase this software, which allows Growth Direct systems to export result reports and securely link to a customer's two-way LIMS connection software to completely eliminate manual data entry and drive productivity.

Service revenue

We derive service revenue from validation services, field service including installations, and service contracts sold to our customers. Revenue from validation services and field service are non-recurring service revenue streams, while revenue from service contracts is a recurring service revenue stream.

We offer our customers validation services (including related documentation) that enable them to replace their existing manual testing method and utilize their Growth Direct systems in compliance with relevant MQC regulations. Validation services are recognized as revenue over time as these services are provided to the customer.

We offer our customers service contracts that can be purchased after the expiration of the one-year assurance warranty that all of our customers receive with the purchase of a Growth Direct system. Under these contracts, they are entitled to receive phone support, emergency on-site maintenance support and two preventative maintenance visits per year. These service contracts generally have fixed fees and a term of one year. We recognize revenue from the sale of service contracts over time as these services are provided over the respective contract term.

We also offer our customers field service which consists of services provided by our field service engineers to install Growth Direct systems at customer sites. We recognize revenue from field service over time as these services are provided to the customer.

We expect service revenue to increase in future periods as the number of placed and validated Growth Direct systems grows and we are able to generate increasing non-recurring revenue from validation services and field service for newly placed systems and increasing recurring revenue from service contracts for validated systems.

Non-commercial revenue

We generate non-commercial revenue from long-term contracts with governmental agencies and third parties. To date, our non-commercial revenue has been derived from contracts with BARDA. Our current contract with BARDA is a cost-reimbursable, cost-sharing arrangement, whereby BARDA reimburses us for a percentage of the total cost incurred which includes allowable indirect costs. We recognize revenue from non-commercial revenue over time using an input method based on cost incurred to date in relation to total estimated cost.

Since the underlying contracts are typically fixed in terms of scope and value, the amount of non-commercial revenue recognized in each period is subject to variability depending on factors such as the number of active contracts as well as the work performed and value remaining under each contract. Based on our current estimates, the remaining funding under our current contract with BARDA will be fully utilized during the three months ended June 30, 2021. We received additional funding in April 2021 from BARDA.

Costs and operating expenses

Costs of revenue

Cost of product revenue primarily consists of costs for raw material parts and associated freight, shipping and handling costs, salaries and other personnel costs including stock-based compensation expense, contract

manufacturer costs, scrap, warranty cost, inventory reserves, royalties, depreciation and amortization expense, allocated information technology and facility-related costs, overhead and other costs related to those sales recognized as product revenue in the period.

Cost of service revenue primarily consists of salaries and other personnel costs including stock-based compensation expense, travel costs, materials consumed when performing installations, validations and other services, allocated information technology and facility-related costs associated with training, and other expenses related to service revenue recognized in the period.

Cost of non-commercial revenue primarily consists of salaries and other personnel costs including stock-based compensation expense, consulting expense, materials, travel and other costs related to the revenue recognized as non-commercial revenue during the period. Our contract with BARDA is subject to the Federal Acquisition Regulation, or FAR and is priced based on estimated or actual costs of producing goods or providing services. The FAR provides guidance on the types of costs that are allowable in establishing prices for goods or services provided under U.S. government contracts.

We expect that our cost of revenue will generally increase or decrease to the extent that our revenue increases or decreases, but that such costs will increase more slowly than the related revenue streams over time.

Research and development

Research and development expenses consist primarily of costs incurred for our research activities, product development, hardware and software engineering and consultant services and other costs associated with our technology Growth Direct platform and products, which include:

- employee-related expenses, including costs for salaries, bonuses and other personnel costs including stock-based compensation expense, for employees engaged in research and development functions;
- the cost of developing, maintaining and improving new and existing product designs;
- the cost of hardware and software engineering;
- research materials and supplies;
- external costs of outside consultants engaged to conduct research and development associated with our technology and products; and
- information technology and facilities expenses, which include direct and allocated expenses for rent, maintenance of facilities and insurance as well as related depreciation and amortization.

Our research and development costs are expensed as incurred. We believe that our continued investment in research and development is essential to our long-term competitive position and we expect these expenses to increase in future periods.

Sales and marketing

Sales and marketing expenses consist primarily of salaries, commissions, benefits and other personnel costs including stock-based compensation expense as well as costs relating to travel, consulting, public relations and allocated information technology and facility-related costs for our employees engaged in sales and marketing activities. We expect sales and marketing expenses to increase in future periods as the number of sales and marketing personnel grows and we continue to expand our geographic reach and capabilities, broaden our customer base and introduce new products.

General and administrative

General and administrative expenses consist primarily of salaries, bonuses and other personnel costs including stock-based compensation expense for our finance, legal, human resources and general management employees, as well as professional fees for legal, patent, accounting, audit, investor relations, recruiting, consulting and

other services. General and administrative expenses also include direct and allocated information technology and facility-related costs. General and administrative expenses are expected to increase in future periods as the number of administrative personnel grows to support increasing business size and complexity. We also anticipate that we will incur incremental accounting, audit, legal, regulatory, compliance and director and officer insurance costs as well as investor relations expenses associated with operating as a public company.

Other income (Expense)

Interest expense

Interest expense is comprised of interest cost associated with outstanding borrowings under our loan and security agreements as well as the amortization of deferred financing costs and debt discounts associated with such arrangements.

Change in fair value of preferred stock warrant liability

In connection with the May 2020 term loan facility we entered into with a lender, or 2020 Term Loan, we issued 1,195,652 warrants to purchase shares of Series C1 Preferred Stock at an exercise price of $1.15 per share. These warrants were immediately exercisable and expire 10 years after the issuance date. We also have other outstanding warrants to purchase preferred stock issued in connection with previous financing arrangements.

We classify all of our warrants to purchase preferred stock as a liability on our consolidated balance sheets because the warrants are freestanding financial instruments that may require us to transfer assets upon exercise. The liability associated with each of these warrants was initially recorded at fair value upon the issuance date and is subsequently remeasured to fair value at each reporting date. The resulting change in the fair value of the preferred stock warrant liability is recorded as a component of other income (expense) in our consolidated statements of operations. We will continue to recognize changes in the fair value of this preferred stock warrant liability at each reporting period until each respective warrant is exercised, expires or qualifies for equity classification.

Loss on extinguishment of debt

Loss on extinguishment of debt includes a loss from the conversion of the 2020 Convertible Notes into Series C1 Preferred Stock in April 2020. In addition, the loss on extinguishment of debt includes unamortized issuance costs, back-end fees and early payment fees related to the refinancing of our $18.0 million term loan with a new $25.0 million term loan, in May 2020. We determined the loss on extinguishment of debt to be the difference between the reacquisition price of the debt and net carrying value of the extinguished debt.

Other income

Other income primarily consists of interest income as well as other miscellaneous income unrelated to our core operations.

Income tax expense

We generated significant taxable losses during the years ended December 31, 2019 and 2020 and during the three months ended March 31, 2020 and 2021, and, therefore, have not recorded any U.S. federal or state income tax expense during those periods. However, we did record an immaterial amount of foreign income tax expense during each of those periods.

We have not recorded any U.S. federal or state income tax benefits for the net operating losses we have incurred in each year or for the research and development tax credits we generated in the United States. As of December 31, 2020, we had U.S. federal and state net operating loss, or NOL, carryforwards of $212.5 million and $106.7 million, respectively, which may be available to offset future taxable income and begin to expire in 2027 and 2025, respectively. Additionally, we had a federal NOL carryforward of $78.2 million generated since 2018 that will never expire. As of December 31, 2020, we also had U.S. federal and state research and development tax credit carryforwards of $3.1 million and $2.0 million, respectively, which may be available to

offset future tax liabilities and begin to expire in 2028 and 2024, respectively. Utilization of the U.S. federal and state NOL carryforwards and research and development tax credit carryforwards may be subject to a substantial annual limitation due to ownership changes that have occurred previously or that could occur in the future. We have recorded a full valuation allowance against our net deferred tax assets at each balance sheet date.

Results of operations

Revision of prior period financial statements

The accompanying Management's Discussion and Analysis of Financial Condition and Results of Operations gives effect to the revision of our previously reported consolidated financial statements for fiscal years 2019 and 2020. A description of the impact of the error on our consolidated financial statements is disclosed within Note 1, *Basis of Presentation*, to our consolidated financial statements as of December 31, 2019 and 2020 and for the years then ended, appearing at the end of this prospectus.

Comparison of the years ended December 31, 2019 and 2020

The following table summarizes our results of operations for the years ended December 31, 2019 and 2020:

	Year Ended December 31,		Change	
	2019	2020	Amount	%
	(in thousands)			
Revenue:				
Product revenue	$ 9,328	$ 10,992	$ 1,664	17.8%
Service revenue	2,128	3,091	963	45.3%
Non-commercial revenue	5,056	1,994	(3,062)	(60.6%)
Total revenue	16,512	16,077	(435)	(2.6%)
Costs and operating expenses:				
Cost of product revenue	10,627	18,642	8,015	75.4%
Cost of service revenue	3,021	3,386	365	12.1%
Cost of non-commercial revenue	3,098	2,120	(978)	(31.6%)
Research and development	5,429	6,531	1,102	20.3%
Sales and marketing	4,047	5,962	1,915	47.3%
General and administrative	8,924	9,976	1,052	11.8%
Total costs and operating expenses	35,146	46,617	11,471	32.6%
Loss from operations	(18,634)	(30,540)	(11,906)	63.9%
Other income (expense):				
Interest expense	(2,375)	(3,447)	(1,072)	45.1%
Change in fair value of preferred stock warrant liability	249	(69)	(318)	(127.7%)
Loss on extinguishment of debt	—	(2,910)	(2,910)	100.0%
Other income	16	22	6	37.5%
Total other income (expense), net	(2,110)	(6,404)	(4,294)	203.5%
Loss before income taxes	(20,744)	(36,944)	(16,200)	78.1%
Income tax expense	427	134	(293)	(68.6%)
Net loss	$(21,171)	$(37,078)	$(15,907)	75.1%

Revenue

Product revenue increased by $1.7 million, or 17.8%, with $1.3 million of the increase attributable to higher Growth Direct system placements as well as higher consumable shipment volumes due to an increase in cumulative

Growth Direct systems validated and increased utilizations at certain customer sites. Of the remaining increase of $0.4 million, a total of $0.5 million was attributable to higher average selling prices, partially offset by a $0.1 million decrease due to product mix during 2020.

Service revenue increased by $1.0 million, or 45.3%. The increase in service revenue was primarily due to a $0.7 million increase in service contract revenue, driven by an increase in cumulative Growth Direct systems validated, as well as a $0.2 million increase in validation revenue and a $0.1 million increase in field service revenue due to the increase in Growth Direct systems placed during 2020.

During the year ended December 31, 2020, travel restrictions and shelter-in-place orders related to COVID-19 negatively impacted our ability to ship, install and validate systems, as well as train customers in certain geographies. This negatively impacted our product and service revenue in the year. While we expect these disruptions to continue to impact our operating results, the related financial impact and duration of these disruptions cannot be reasonably estimated at this time.

Non-commercial revenue decreased by $3.1 million, or 60.6%. The decrease in non-commercial revenue was primarily due to a reduction in billable costs of $1.6 million due to a lower level of reimbursable activity and a reduction of $1.5 million in the cost-sharing percentage at which BARDA reimbursed costs under the contract.

Costs and operating expenses

Costs of revenue

Cost of product revenue increased by $8.0 million, or 75.4%. During the year ended December 31, 2019, we were able to sell inventory that was written down in previous years, resulting in no cost associated with these products. As a result, our cost of product revenue was lower by $3.5 million during the year ended December 31, 2019. The remaining increase was due to $1.4 million in higher product and freight cost due to increased sales volume, an increase of $1.3 million in personnel-related costs resulting from higher headcount to support increased production volume and manufacturing support activities as well as to provide redundancy in the event of potential COVID-19 related disruptions, a $1.2 million increase in material cost related to the transition to our new automated consumable production line and other one-time events, a $0.3 million increase in depreciation expense related to our automated production line, and a net increase of $0.3 million in other costs.

Cost of service revenue increased by $0.4 million, or 12.1%. This increase was primarily due to higher headcount-related costs associated with additional validation and field service employees hired in 2019 and 2020 to support increased service activity.

Cost of non-commercial revenue decreased by $1.0 million, or 31.6%. This decrease was primarily due to a reduction in spend due to the timing and extent of development activities, with consulting activities down $0.8 million and employee salary and benefit costs down $0.1 million.

Research and development

	Year Ended December 31,		Change	
	2019	2020	Amount	%
	(dollars in thousands)			
Research and development	$ 5,429	$ 6,531	$ 1,102	20.3%
Percentage of total revenue	32.9%	40.6%		

Research and development expenses increased by $1.1 million, or 20.3%. This increase was primarily due to an increase of $0.6 million in employee-related costs due primarily to higher headcount, an increase of $0.4 million in consulting expenses to support research and development activities, and an increase of $0.1 million in other general research and development expenses.

Sales and marketing

	Year Ended December 31,		Change	
	2019	2020	Amount	%
	(dollars in thousands)			
Sales and marketing	$ 4,047	$ 5,962	$ 1,915	47.3%
Percentage of total revenue	24.5%	37.1%		

Sales and marketing expenses increased by $1.9 million, or 47.3%. This increase was primarily due to the expansion of our sales organization, resulting in a $1.4 million increase in employee-related costs (including commissions earned), a $0.3 million increase in recruiting and consulting fees, and a $0.2 million increase in other expenses to support our sales and marketing organizations, net of lower travel-related expenses due to COVID-19.

General and administrative

	Year Ended December 31,		Change	
	2019	2020	Amount	%
	(dollars in thousands)			
General and administrative	$ 8,924	$ 9,976	$ 1,052	11.8%
Percentage of total revenue	54.0%	62.1%		

General and administrative expenses increased by $1.1 million, or 11.8%. This increase was primarily due to a $1.4 million increase in professional fees related to legal, audit, accounting, recruiting and consulting activities due to an increase in underlying business activity. The increase was partially offset by a $0.3 million reduction attributable to reduced travel-related expenses due to COVID-19 and lower stock compensation expense.

Other income (expense)

Interest expense

Interest expense for the years ended December 31, 2019 and 2020 was $2.4 million and $3.4 million, respectively. The increase of $1.1 million, or 45.1%, was primarily due to $0.7 million in term loan interest expense, which increased primarily due to the refinancing of our $18.0 million term loan with a new $25.0 million term loan in May 2020. Also contributing to the increase was $0.3 million in interest and amortization of derivative discount associated with the 2020 Convertible Notes issued in February 2020 and subsequently converted to shares of Series C1 Preferred Stock in April 2020.

Change in fair value of preferred stock warrant liability

The change in fair value of preferred stock warrant liability was a gain of $0.2 million for the year ended December 31, 2019, compared to a loss of $0.1 million for the year ended December 31, 2020. The change was due primarily to an increase in the fair value of the underlying preferred stock used to determine the value of preferred stock warrants.

Loss on extinguishment of debt

There was no loss on extinguishment of debt for the year ended December 31, 2019, compared to a $2.9 million loss for the year ended December 31, 2020. The $2.9 million loss in 2020 is comprised of a $2.0 million extinguishment loss from the conversion of the 2020 Convertible Notes into Series C1 preferred stock and an extinguishment loss of $0.9 million from refinancing of our $18.0 million term loan with a new $25.0 million term loan in May 2020, which consisted of unamortized issuance cost of $0.2 million, back-end fee payment of $0.6 million, and early payment fees of $0.1 million.

Income tax expense

Income tax expense was $0.4 million for the year ended December 31, 2019, compared to $0.1 million for the year ended December 31, 2020. The decrease of $0.3 million relates primarily to a lower amount of income tax expense recorded related to our German subsidiary in 2020.

Comparison of the three months ended March 31, 2020 and 2021

The following table summarizes our results of operations for the three months ended March 31, 2020 and 2021:

	Three Months Ended March 31,		Change	
	2020	2021	Amount	%
	(in thousands)			
Revenue:				
Product revenue	$ 1,188	$ 3,718	$ 2,530	213.0%
Service revenue	410	1,067	657	160.2%
Non-commercial revenue	1,401	210	(1,191)	(85.0%)
Total revenue	2,999	4,995	1,996	66.6%
Costs and operating expenses:				
Cost of product revenue	3,212	5,510	2,298	71.5%
Cost of service revenue	951	1,137	186	19.6%
Cost of non-commercial revenue	797	414	(383)	(48.1%)
Research and development	1,438	2,147	709	49.3%
Sales and marketing	1,466	2,275	809	55.2%
General and administrative	2,371	3,203	832	35.1%
Total costs and operating expenses	10,235	14,686	4,451	43.5%
Loss from operations	(7,236)	(9,691)	(2,455)	33.9%
Other income (expense):				
Interest expense	(763)	(932)	(169)	22.1%
Change in fair value of preferred stock warrant liability	5	(11,448)	(11,453)	n/m
Other income (expense), net	7	(11)	(18)	(257.1%)
Total other income (expense), net	(751)	(12,391)	(11,640)	1549.9%
Loss before income taxes	(7,987)	(22,082)	(14,095)	176.5%
Income tax expense	20	19	(1)	(5.0%)
Net loss	$ (8,007)	$ (22,101)	$(14,094)	176.0%

Revenue

Product revenue increased by $2.5 million, or 213.0%. The increase of $2.7 million is attributable to higher number of Growth Direct system placements during the three months ended March 31, 2021, as well as higher volume of consumable shipments due to an increase in cumulative Growth Direct systems validated and increased utilizations at certain customer sites. The increase is partially offset by a $0.2 million decrease in price and product mix.

Service revenue increased by $0.7 million, or 160.2%. The increase in service revenue was primarily due to a $0.3 million increase in validation revenue, a $0.3 million increase in service contract revenue, driven by an increase in cumulative Growth Direct systems validated, as well as a $0.1 million increase in field service revenue due to the increase in Growth Direct systems placed during the first quarter of 2021.

Non-commercial revenue decreased by $1.2 million, or 85.0%. The decrease in non-commercial revenue was primarily due to a reduction in billable costs of $0.8 million due to a lower level of reimbursable activity and a reduction of $0.4 million in the cost-sharing percentage at which BARDA reimbursed costs under its contract with us.

Costs and operating expenses

Costs of revenue

Cost of product revenue increased by $2.3 million, or 71.5%. The increase was due to $1.5 million in higher product and freight cost due to increased sales volume, an increase of $0.5 million in personnel-related costs resulting from higher headcount to support increased production volume and manufacturing support activities, as well as to provide redundancy in the event of potential COVID-19 related disruptions, and a $0.3 million increase in facilities-related costs, which includes regular COVID-19 testing service for on-site employees.

Cost of service revenue increased by $0.2 million, or 19.6%. This increase was primarily due to higher headcount-related costs associated with additional validation and field service employees hired in the later part of 2020 and in early 2021 to support increased service activity.

Cost of non-commercial revenue decreased by $0.4 million, or 48.1%. This decrease was primarily due to a reduction in spend due to the timing and extent of development activities, with consulting activities down $0.3 million and a reduction in other BARDA-related costs of $0.1 million.

Research and development

	Three Months Ended March 31,		Change	
	2020	2021	Amount	%
	(dollars in thousands)			
Research and development	$ 1,438	$ 2,147	$ 709	49.3%
Percentage of total revenue	47.9%	43.0%		

Research and development expenses increased by $0.7 million, or 49.3%. This increase was primarily due to an increase of $0.5 million in consulting expenses to support research and development activities, an increase of $0.1 million in employee-related costs due primarily to higher headcount, and an increase of $0.1 million in other general research and development expenses.

Sales and marketing

	Three Months Ended March 31,		Change	
	2020	2021	Amount	%
	(dollars in thousands)			
Sales and marketing	$ 1,466	$ 2,275	$ 809	55.2%
Percentage of total revenue	48.9%	45.5%		

Sales and marketing expenses increased by $0.8 million, or 55.2%. This increase was primarily due to a $0.6 million increase in market research, recruiting and consulting fees, and a $0.2 million increase in employee-related costs (including commissions earned) due to higher headcount.

General and administrative

	Three Months Ended March 31,		Change	
	2020	2021	Amount	%
	(dollars in thousands)			
General and administrative	$ 2,371	$ 3,203	$ 832	35.1%
Percentage of total revenue	79.1%	64.1%		

General and administrative expenses increased by $0.8 million, or 35.1%. This increase was primarily due to a $0.6 million increase in employee-related costs driven by higher headcount and a $0.4 million increase in professional fees related to legal, audit, accounting, recruiting and consulting activities due to an increase in underlying business activity. The increase was partially offset by a decrease of $0.2 million in other general and administrative expenses.

Other income (expense)

Interest expense

Interest expense for the three months ended March 31, 2020 and 2021 was $0.8 million and $0.9 million, respectively. The increase of $0.1 million, or 22.1%, was primarily due to a larger long-term debt principal balance incurring interest expense at March 31, 2021.

Change in fair value of preferred stock warrant liability

The change in fair value of preferred stock warrant liability was a gain of less than $0.1 million for the three months ended March 31, 2020, compared to a loss of $11.4 million for the three months ended March 31, 2021. The change was due primarily to an increase in the fair value of the underlying preferred stock used to determine the value of preferred stock warrants.

Liquidity and capital resources

Since our inception, we have incurred significant operating losses. To date, we have funded our operations primarily through proceeds from sales of redeemable convertible preferred stock, borrowings under loan agreements and revenue from sales of our products, services and contracts. As of December 31, 2020, we had cash and cash equivalents and short-term investments of $113.6 million. In March 2021, we sold shares of our Series D1 and D2 preferred stock for gross proceeds of $81.0 million. We believe that our existing cash and cash equivalents and short-term investments will enable us to fund our operating expenses, capital expenditure requirements and debt service payments for at least twelve months following the date these consolidated financial statements were to be issued.

We have based this estimate on assumptions that may prove to be inaccurate, and we may utilize our available capital resources sooner than we expect. Our future funding requirements will depend on many factors, including:

- market uptake of our Growth Direct system;
- the expansion of our sales, marketing and distribution capabilities;
- the cost of our research and development activities and timely launch of new features and products;
- the effect of competing technological and market developments;
- the ability to scale and expand manufacturing capabilities to support sales growth; and
- the level of our sales and marketing expenses and general and administrative expenses.

We cannot assure you that we will be able to obtain additional funds on acceptable terms, or at all. If we raise additional funds by issuing equity or equity-linked securities, our stockholders may experience dilution. Future debt financing, if available, may involve covenants, in addition to our existing covenants, restricting our operations or our ability to incur additional debt or potentially limiting our ability to obtain new debt financing or the refinance of our existing debt. Any debt or equity financing that we raise may contain terms that are not favorable to us or our stockholders. If we do not have or are not able to obtain sufficient funds, we may have to delay development or commercialization of our products. We also may have to reduce sales, marketing, research and development, customer support or other resources devoted to our products or cease operations.

Cash flows

The following table summarizes our sources and uses of cash for each of the periods presented:

	Year Ended December 31,		Three Months Ended March 31,	
	2019	2020	2020	2021
	(in thousands)			
Net cash used in operating activities	$(21,147)	$(30,996)	$ (8,315)	$ (11,262)
Net cash (used in) provided by investing activities	(1,695)	(15,670)	(79)	9,749
Net cash provided by financing activities	14,870	64,234	9,500	80,069
Net (decrease) increase in cash and cash equivalents and restricted cash	$ (7,972)	$ 17,568	$ 1,106	$ 78,556

Operating activities

During the year ended December 31, 2019, operating activities used $21.1 million of cash, primarily resulting from our net loss of $21.2 million and net cash used by changes in our operating assets and liabilities of $2.1 million, partially offset by non-cash charges of $2.2 million. Net cash used by changes in our operating assets and liabilities for the year ended December 31, 2019 consisted primarily of an increase of $3.9 million in raw material inventory to support a projected increase in demand, an increase of $1.3 million in prepaid expenses and other current assets primarily due to an inventory deposit and prepaid commitment fees related to our 2018 Term Loan, an increase in accounts receivable of $0.5 million and an increase of $0.3 million in other long-term assets. These cash uses were partially offset by an increase of $1.4 million in deferred revenue, an increase of $1.0 million in accounts payable, an increase of $1.0 million in accrued expenses and other current liabilities and an increase of $0.5 million in deferred rent. The increase in accounts payable and accrued expenses and other current liabilities was due to the timing of invoicing and cash disbursement. The increase in accounts receivable and deferred revenue was due to an increase in billing and timing of revenue recognition.

During the year ended December 31, 2020, operating activities used $31.0 million of cash, primarily resulting from our net loss of $37.1 million and net cash used by changes in our operating assets and liabilities of $1.1 million, partially offset by non-cash charges of $7.2 million. Net cash used by changes in our operating assets and liabilities for the year ended December 31, 2020 consisted primarily of an increase of $3.4 million in inventory to support a projected increase in demand, an increase in accounts receivable of $1.4 million, an increase of $1.3 million in prepaid expenses and other current assets, and an increase of $0.4 million in other long-term assets. These cash uses were partially offset by an increase of $2.5 million in deferred revenue, an increase of $1.8 million in accrued expenses and other current liabilities, and an increase of $1.0 million in accounts payable. The increase in accounts payable and accrued expenses was due to timing of invoicing and cash disbursement. The increase in accounts receivable was a result of higher product revenue. The increase in deferred revenue was due to an increase in advance billings for validation services related to the volume and timing of Growth Direct system placements as well as an increase in advance billings related to a higher number of systems under service contracts.

During the three months ended March 31, 2020, operating activities used $8.3 million in cash, primarily resulting from our net loss of $8.0 million, net cash used by changes in our operating assets and liabilities of $1.2 million, which were partially offset by non-cash charges of $0.9 million. Net cash used by changes in our operating assets and liabilities for the three months ended March 31, 2020 consisted primarily of increases in inventory of $1.0 million and other long-term assets of $1.0 million both related to purchases and deposits for inventory, as well as a decrease in accounts payable of $1.1 million. The cash used by operating assets and liability is partially offset by a decrease in accounts receivable of $1.2 million and an increase in deferred revenue of $0.7 million.

During the three months ended March 31, 2021, operating activities used $11.3 million in cash, primarily resulting from our net loss of $22.1 million, net cash used by changes in our operating assets and liabilities of

$1.3 million, which were partially offset by non-cash charges of $12.1 million, which include the non-cash change in fair value of preferred stock warrant liability of $11.4 million. Net cash used by changes in our operating assets and liabilities for the three months ended March 31, 2021 consisted primarily of increases in inventory of $0.8 million to support increased production volume, and decreases of $2.0 million in accounts payable and $0.8 million in accrued expenses and other current liabilities. The cash used by operating assets and liability is partially offset by a decrease in accounts receivable of $1.3 million, an increase in deferred revenue of $0.7 million, and a decrease in prepaid and other current assets of $0.3 million.

Investing activities

During the year ended December 31, 2019, net cash used in investing activities was $1.7 million, consisting entirely of purchases of property and equipment.

During the year ended December 31, 2020, net cash used in investing activities was $15.7 million, consisting of purchases of short-term investments of $25.0 million and purchases of property and equipment of $0.7 million, offset by maturities of short-term investments of $10.0 million.

During the three months ended March 31, 2020, net cash used in investing activities was $0.1 million, consisting entirely of purchases of property and equipment.

During the three months ended March 31, 2021, net cash provided by investing activities was $9.7 million, consisting of maturities of investments of $10.0 million, partially offset by purchases of property and equipment of $0.3 million.

Financing activities

During the year ended December 31, 2019, net cash provided by financing activities was $14.9 million, consisting primarily of net proceeds of $14.9 million from the issuance of Series B1 redeemable convertible preferred stock, net of issuance costs.

During the year ended December 31, 2020, net cash provided by financing activities was $64.2 million, consisting primarily of net proceeds of $49.9 million from the issuance of Series C1 and C2 redeemable convertible preferred stock, net of issuance costs, $24.1 million in net proceeds from borrowings under our 2020 Term Loan and $9.5 million in proceeds from the issuance of the Convertible Notes. These cash inflows were partially offset by a $19.4 million cash outflow for principal and fees paid in conjunction with the extinguishment of our 2018 term loan.

During the three months ended March 31, 2020, net cash provided by financing activities was $9.5 million, consisting of net proceeds of $9.5 million from the issuance of the Convertible Notes.

During the three months ended March 31, 2021, net cash provided by financing activities was $80.1 million, consisting primarily of net proceeds of $79.8 million from the issuance of Series D1 and D2 redeemable convertible preferred stock, and $0.6 million in proceeds from restricted common stock purchased by an employee and stock option exercises, partially offset by $0.3 million cash paid for deferred offering costs.

Long-term debt

In May 2020, we entered into the 2020 Term Loan which provides for borrowings of an initial $25.0 million tranche upon closing and options to borrow up to an aggregate of $35.0 million in two additional tranches of $20.0 million under the second tranche, or the Term B Loan, and $15.0 million under the third tranche, or the Term C Loan, subject to certain Growth Direct system sales milestones. The milestone entitling us to draw the Term B Loan is achieved when we have received, on a cumulative basis, a predefined number of new system orders during a consecutive twelve month period between January 1, 2020 and November 14, 2021. The milestone entitling us to draw the Term C Loan is achieved when we receive, on a cumulative basis, a predefined number of new system orders during a consecutive eighteen month period between January 1, 2020 and May 14, 2022. At closing, we issued warrants to purchase 1,195,652 shares of Series C1 Preferred Stock to the lender with an

exercise price of $1.15 per share. We would be obligated to issue additional warrants to the lender with an aggregate exercise value equal to $1.1 million and $0.8 million in the event that we draw down the Term B Loan and Term C Loan, respectively. We paid a $0.8 million facility fee in connection with the 2020 Term Loan.

The 2020 Term Loan's interest rate can be elected each quarter by us, as either (a) 12%, up to 7% of which may be Payment in Kind, or PIK, interest or (b) 13% PIK interest. Accrued cash interest on the 2020 Term Loans is payable quarterly. All outstanding principal, including any and all accrued PIK interest, is due and payable in full in May 2025, or the Maturity Date. We have the option to prepay all or a portion of the principal balance prior to the Maturity Date, subject to a prepayment premium. The 2020 Term Loan agreement includes certain financial and non-financial covenants. These covenants include exceeding certain minimum revenue thresholds on a trailing twelve-month basis, maintaining a minimum balance of $1.5 million in cash and cash equivalents, maintaining all inventory in good and marketable condition, and reporting requirements for any material adverse changes in our financial condition. We were in compliance with all covenants through the issuance date of these consolidated financial statements. For additional information on the 2020 Term Loan please see Note 9 — *Long-term Debt* to consolidated financial statements.

Contractual obligations and commitments

In October 2013, we entered into an operating lease for office and manufacturing space in Lowell, Massachusetts, which expires in July 2026. The terms of the lease include options for a one-time, five-year extension of the lease and early termination of the lease in July 2024 as well as a $0.7 million tenant improvement allowance which has been drawn down in full. Future minimum commitments under this lease through July 2026 are $2.6 million and $2.5 million as of December 31, 2020 and March 31, 2021, respectively.

In December 2016, in connection with the amendment of a then-outstanding loan agreement with the lender, we entered into an agreement under which we are obligated to pay the lender an exit fee in the amount of $0.8 million in the event of a "qualifying exit event" prior to December 31, 2026. As defined in the agreement, a "qualifying exit event" includes but is not limited to a liquidation, merger, sale or change of control of the company or a public offering of its common stock. No amounts were accrued for this exit fee as of December 31, 2020 or March 31, 2021, as the occurrence of a qualifying exit event was not deemed probable.

In March 2020, we entered into an agreement with a supplier to secure future supply of certain materials used in the manufacturing of our Growth Direct systems. As of December 31, 2020, we had committed to minimum payments under these arrangements totaling $0.9 million through December 31, 2022. We had $0.1 million and less than $0.1 million accrued for the supply agreement as of December 31, 2020 and March 31, 2021, respectively.

In December 2020, we entered into a non-cancelable agreement with a service provider for software as a service and cloud hosting services. As of December 31, 2020, we had committed to minimum payments under these arrangements totaling $1.1 million through January 31, 2026. There were no amounts accrued for this agreement as of December 31, 2020 and March 31, 2021.

For additional information on our contractual obligation and commitments please see Note 16 — Commitments and Contingencies to our consolidated financial statements.

Seasonality

Our revenues typically increase progressively over the course of each calendar year, with the first quarter being the lowest and the fourth quarter being the highest revenue quarter in the year. However, our revenues can vary from quarter to quarter as a result of seasonality, including factors such as our customers' budgetary cycles and our customers' budgetary cycles and extended summer vacation periods that could impact our ability to deliver products and provide onsite services to our customers during those periods. We expect this seasonality to continue for the foreseeable future, which may cause fluctuations in our operating results and financial metrics. However, our seasonality trends may vary in the future as our revenue mix shifts from non-recurring to recurring revenues.

Critical accounting policies and significant judgments and estimates

Our consolidated financial statements have been prepared in accordance with generally accepted accounting principles in the United States. The preparation of our consolidated financial statements and related disclosures requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, costs and expenses, and the disclosure of contingent assets and liabilities in our consolidated financial statements. Our estimates are based on our historical experience, known trends and events and various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. We evaluate our estimates and assumptions on an ongoing basis. Our actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in more detail in Note 2 — *Summary of Significant Accounting Policies* to our consolidated financial statements included elsewhere in this prospectus, we believe that the following critical accounting policies are those most important to the judgments and estimates used in the preparation of our consolidated financial statements.

Revenue recognition

Product revenue

We derive product revenue primarily from the sale of Growth Direct systems and related consumables. Product revenue is recognized when control of the promised systems and consumables is transferred to our customers, in an amount that reflects the consideration we expect to be entitled to in exchange for those products or consumables (the transaction price). For Growth Direct systems and consumables sold by us, control transfers to the customer at a point in time.

Service revenue

We derive service revenue primarily from the sale of validation services, service contracts and field service (including installation). Revenue is recognized when services are provided to our customers, in an amount that reflects the consideration we expect to be entitled to in exchange for those services (the transaction price). Service revenue is recognized over time using an input method based on time lapsed for service contracts and using an output method based on milestones achieved for validation services and field service.

Performance obligations

A performance obligation is a promise in a contract to transfer a distinct product or service to a customer that are both capable of being distinct, whereby the customer can benefit from the product or service either on its own or together with other resources that are readily available, and are distinct in the context of the contract, whereby the transfer of the product or service is separately identifiable from other promises in the contract. Our main performance obligations in customer arrangements are Growth Direct systems, LIMS connection software, proprietary consumables, validation services, field service and services due under service contracts.

Multiple performance obligations

Our contracts may include multiple performance obligations when customers purchase a combination of products and services such as Growth Direct system sold together with the LIMS connection software, proprietary consumables or services. For these arrangements, we allocate the contract's transaction price to each performance obligation on a relative standalone selling price basis using our best estimate of the standalone selling price of each distinct product or service in the contract. The primary methods used to estimate standalone selling prices are based on the prices observed in standalone sales to customers or cost-plus margin depending on the nature of the obligation and available evidence of fair value. Allocation of the transaction price is determined at contract's inception.

Non-commercial revenue

We generate revenue from a long-term contract with BARDA, which is part of the U.S. government. The contract is a cost-reimbursable, cost-sharing contract, whereby BARDA reimburses us for a percentage of the total costs that have been incurred including indirect allowable rates. We include the unconstrained amount of consideration in the transaction price. The amount included in the transaction price is constrained to the amount for which it is probable that a significant reversal of cumulative revenue recognized will not occur.

Stock-based compensation

We measure stock-based option awards granted to employees, officers and directors based on their fair value on the date of grant using the Black-Scholes option-pricing model. Compensation expense for those awards is recognized over the requisite service period, which is generally the vesting period of the respective award. We account for forfeitures as they occur. The straight-line method of expense recognition is applied to all awards with service-only conditions.

The fair value of each stock option is estimated on the grant date using the Black-Scholes option-pricing model, which uses inputs such as the fair value of our common stock and assumptions we make for the volatility of our common stock, the expected term of our common stock options, the risk-free interest rate for a period that approximates the expected term of our common stock options, and our expected dividend yield.

We measure all restricted common stock granted to employees based on the common stock value on the date of grant. The purchase price of the restricted common stock is the common stock value on the date of grant. The restricted common stock includes a repurchase right, whereas upon the occurrence of a specific event, we have the right to repurchase unvested restricted common stock shares. As such the fair value of the restricted common stock is included in other long-term liabilities in the consolidated balance sheet.

Determination of fair value of common stock

As there has been no public market for our common stock to date, the estimated fair value of our common stock has been determined by our board of directors as of the date of each option grant, with input from management. The board considers our most recently available third-party valuations of common stock and an assessment of additional objective and subjective factors that it believed were relevant and which may have changed from the date of the most recent valuation through the date of the grant. These third-party valuations are performed in accordance with the guidance outlined in the American Institute of Certified Public Accountants' Accounting and Valuation Guide, Valuation of Privately-Held-Company Equity Securities Issued as Compensation.

Our common stock valuations are prepared using either an option pricing method, or OPM, or a hybrid method, both of which use market approaches and income approaches to estimate our enterprise value. The hybrid method is a probability-weighted expected return method, or PWERM, where the equity value in two or more of the scenarios is calculated using an OPM. The PWERM is a scenario-based methodology that estimates the fair value of common stock based upon an analysis of future values for the company, assuming various outcomes. The common stock value is based on the probability-weighted present value of expected future investment returns considering each of the possible outcomes available as well as the rights of each class of stock. The future value of the common stock under each outcome is discounted back to the valuation date at an appropriate risk-adjusted discount rate and probability weighted to arrive at an indication of value for the common stock. A discount for lack of marketability of the common stock is then applied to arrive at an indication of value for the common stock. The OPM treats common stock and preferred stock as call options on the total equity value of a company, with exercise prices based on the value thresholds at which the allocation among the various holders of a company's securities changes. Under this method, the common stock has value only if the funds available for distribution to stockholders exceeded the value of the preferred stock liquidation preferences at the time of the liquidity event, such as a strategic sale or a merger. These third-party valuations were performed as of various dates, which resulted in the following valuations of our common stock:

Date	Per-Share Valuation of Common Stock
October 21, 2019	$ 0.22
May 14, 2020	$ 0.15
January 1, 2021	$ 0.42
March 9, 2021	$ 2.17
May 24, 2021	$ 2.29
June 17, 2021	$ 2.72

In addition to considering the results of these third-party valuations, our board of directors considered various objective and subjective factors to determine the fair value of our common stock as of each grant date, including:

- the prices at which we sold shares of preferred stock (including our sale of Series D1 and Series D2 preferred stock in March 2021) and the superior rights and preferences of the preferred stock relative to our common stock at the time of each grant;
- the progress of the research and development of our products;
- our stage of development and commercialization and our business strategy;
- external market conditions affecting our industry and the global pharmaceutical industry;
- our financial position, including cash on hand, and our historical and forecasted performance and operating results;
- the lack of an active public market for our common stock and our preferred stock;
- the likelihood of achieving a liquidity event, such as an initial public offering, or IPO, or sale of our company in light of prevailing market conditions; and
- the analysis of IPOs and the market performance of similar companies in the life sciences tools and diagnostics industries.

The assumptions underlying these valuations represent management's best estimates, which involve inherent uncertainties and the application of management's judgment. As a result, if we had used significantly different assumptions or estimates, the fair value of our common stock and our stock-based compensation expense could have been materially different.

Once a public trading market for our common stock has been established in connection with the completion of this offering, it will no longer be necessary for our board of directors to estimate the fair value of our common stock in connection with our accounting for granted stock options and other such awards we may grant, as the fair value of our common stock will be determined based on the quoted market price of our common stock.

Options and restricted stock awards granted

The following table summarizes, by grant date, the number of shares subject to awards granted between January 1, 2020 and June 23, 2021, the per share exercise price of the options, the fair value of common stock on each grant date, and the per share estimated fair value of the awards:

Grant Date	Type of Award	Number of Shares Subject to Options/Awards Granted	Per Share Exercise Price of Options/ Awards	Per Share Fair Value of Common Shares on Grant Date	Per Share Estimated Fair Value of Options/ Awards
February 7, 2020	Options	100,000	$ 0.22	$ 0.22	$ 0.16
July 29, 2020	Options	5,567,583	$ 0.15	$ 0.15	$ 0.11
October 29, 2020	Options	856,327	$ 0.15	$ 0.15	$ 0.11
December 18, 2020	Options	211,230	$ 0.15	$ 0.15	$ 0.11
February 1, 2021	Options	1,544,515	$ 0.42	$ 0.42	$ 0.18

Grant Date	Type of Award	Number of Shares Subject to Options/Awards Granted	Per Share Exercise Price of Options/ Awards	Per Share Fair Value of Common Shares on Grant Date	Per Share Estimated Fair Value of Options/ Awards
February 2, 2021	Restricted Award	1,244,515	$ 0.42	$ 0.42	$ 0.42
March 15, 2021	Options	2,901,528	$ 2.17	$ 2.17	$ 0.95
June 7, 2021	Options	1,542,900	$ 2.29	$ 2.29	$ 0.97
June 23, 2021	Options	677,500	$ 2.72	$ 2.72	$ 1.15

Valuation of warrants to purchase preferred stock

We classify warrants to purchase shares of our redeemable convertible preferred stock as liabilities on our consolidated balance sheets as these warrants are free-standing financial instruments that may require us to transfer assets upon exercise. The preferred stock warrant liability is initially recorded at fair value on the issuance date of each warrant and is subsequently remeasured to fair value at each reporting date. Changes in the fair value of the preferred stock warrant liability are recognized as a component of other income (expense) in our consolidated statements of operations. We will continue to adjust the liability for changes in fair value until the warrants are exercised, expire or qualify for equity classification.

We utilize the Black-Scholes option-pricing model, which incorporates management's assumptions and estimates, to value the preferred stock warrants. We assess these assumptions and estimates on a quarterly basis as additional information impacting the assumptions is obtained. Estimates and assumptions impacting the fair value measurement include the fair value per share of the underlying redeemable convertible preferred stock, the remaining contractual term of the warrants, risk-free interest rate, expected dividend yield and expected volatility of the price of the underlying preferred stock. We determine the fair value per share of the underlying preferred stock by taking into consideration our most recent sales of our preferred stock as well as additional factors that we deem relevant. We have historically been a private company and lack company-specific historical and implied volatility information of our stock. Therefore, we estimate expected stock volatility based on the historical volatility of publicly traded peer companies for a term equal to the remaining contractual term of the warrants. The risk-free interest rate is determined by reference to the U.S. Treasury yield curve for time periods approximately equal to the remaining contractual term of the warrants. We have estimated a 0% dividend yield based on the expected dividend yield and the fact that we have never paid or declared dividends.

Upon the closing of this offering, the warrants to purchase shares of redeemable convertible preferred stock will become exercisable for shares of common stock, at which time we will adjust the redeemable convertible preferred stock warrant liability to fair value prior to reclassifying the redeemable convertible preferred stock warrant liability to additional paid-in capital. As a result, following the closing of this offering, the warrants will no longer be subject to fair value accounting.

Valuation of inventory

We value inventory at the lower of cost or net realizable value. Cost is computed using the first-in, first-out method. We regularly review inventory quantities on-hand for excess and obsolescence and, when circumstances indicate, we record charges to write down inventories to their estimated net realizable value after evaluating future demand, expected product life cycles and current inventory levels. Such charges are classified as cost of product revenue in the statements of operations. Any write-down of inventory to net realizable value creates a new cost basis.

Valuation of derivatives

We record derivatives initially at fair value upon the issuance of our Unsecured Subordinated Convertible Promissory Notes, or Convertible Notes, issued in February 2020 which relates to a conversion option whereby upon the closing of a specified financing event the Convertible Note will automatically convert into shares of the same class and series of capital stock we issued to other investors in the financing at a conversion price equal

to 80% of the price per share of the securities paid by the other investor. The initial fair value was determined using management's assumption on the likelihood a qualified financing event would occur. Change in the fair value of the derivative liability were recognized as a component of other income (expense), net in the consolidated statement of operations. In April 2020, the specified financing event was consummated, as such the notes were converted into shares of Series C1 Preferred Stock, and the derivative liability was extinguished, and the unamortized derivative discount was recognized as an extinguishment loss.

Recently issued accounting pronouncements

A description of recently issued accounting pronouncements that may potentially impact our financial position, results of operations or cash flows is disclosed in Note 2 — *Summary of Significant Accounting Policies* to our consolidated financial statements appearing at the end of this prospectus.

Quantitative and qualitative disclosures about market risks

Interest rate risk

As of December 31, 2020, we had cash and cash equivalents and short-term investments of $45.1 million, which consisted of cash equivalents and U.S. Treasury securities. As of March 31, 2021, we had cash and cash equivalents and short-term investments of $113.6 million, which consisted of cash equivalents and U.S. Treasury securities. Interest income is sensitive to changes in the general level of interest rates; however, due to the nature of these investments, an immediate 10% change in interest rates would not have a material effect on the fair market value of our investment portfolio.

Borrowings under our 2020 Term Loan bear interest at either (a) 12%, up to 7% of which may be PIK interest or (b) 13% PIK interest. An immediate 10% change in the Wall Street Journal prime rate would not have a material impact on our debt-related obligations, financial position or results of operations.

Foreign currency exchange risk

We are not currently exposed to significant market risk related to changes in foreign currency exchange rates. Our operations may be subject to fluctuations in foreign currency exchange rates in the future.

Inflation risk

We do not believe that inflation has had a material effect on our business, financial condition or results of operations. If our costs were to become subject to significant inflationary pressures, we may not be able to fully offset such higher costs through price increases. Our inability or failure to do so could harm our business, financial condition or results of operations.

Emerging growth company status

The Jumpstart Our Business Startups Act of 2012, or the JOBS Act, permits an "emerging growth company" such as us to take advantage of an extended transition period to comply with new or revised accounting standards applicable to public companies until those standards would otherwise apply to private companies. We have elected to use this extended transition period for complying with new or revised accounting standards that have different effective dates for public and private companies until the earlier of the date we (i) are no longer an emerging growth company or (ii) affirmatively and irrevocably opt out of the extended transition period provided in the JOBS Act. As a result, we will not be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies, and our financial statements may not be comparable to other public companies that comply with new or revised accounting pronouncements as of public company effective dates. We may choose to early adopt any new or revised accounting standards whenever such early adoption is permitted for private companies.

We will cease to be an emerging growth company on the date that is the earliest of (i) the last day of the fiscal year in which we have total annual gross revenues of $1.07 billion or more, (ii) the last day of our fiscal year

following the fifth anniversary of the date of the closing of this offering, (iii) the date on which we have issued more than $1.0 billion in nonconvertible debt during the previous three years or (iv) the date on which we are deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission.

Further, even after we no longer qualify as an emerging growth company, we may still qualify as a "smaller reporting company," which would allow us to take advantage of many of the same exemptions from disclosure requirements, including reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements. We cannot predict if investors will find our common shares less attractive because we may rely on these exemptions. If some investors find our common shares less attractive as a result, there may be a less active trading market for our common shares and our share price may be more volatile.

Business

Defining the future of pharmaceutical quality control

We are leading a global transformation toward fully automated microbial quality control within pharmaceutical manufacturing. Our products safeguard the most complex and critical bioprocessing workflows in the industry, enabling faster, safer, and higher capacity drug production. Through our unique expertise at the intersection of microbiology, robotic systems, and advanced vision algorithms, we are setting the foundation for end-to-end quality control automation to enable the future of advanced pharmaceutical manufacturing.

Overview

We are an innovative life sciences technology company providing mission critical automation solutions to facilitate the efficient manufacturing and fast, safe release of healthcare products such as biologics, vaccines, cell and gene therapies, and sterile injectables. Our flagship Growth Direct platform automates and modernizes the antiquated, manual microbial quality control, or MQC, testing workflows used in the largest and most complex pharmaceutical manufacturing operations across the globe. The Growth Direct platform brings the quality control lab to the manufacturing floor, unlocking the power of in-line / at-the-line MQC automation to deliver faster results, greater accuracy, increased operational efficiency, better compliance with data integrity regulations, and quicker decision making that our customers rely on to ensure safe and consistent supply of important healthcare products.

Our Growth Direct platform is the only fully automated, high-throughput and secure MQC solution. Developed with over 15 years of active feedback from our customers, Growth Direct was purpose-built to meet the MQC challenges posed by the increasing scale, complexity, and regulatory scrutiny confronting global pharmaceutical manufacturers. Our platform delivers the robust and scalable automation necessary to support rapidly expanding demand for novel and complex therapeutic modalities, such as biologics, vaccines, cell and gene therapies, and sterile injectables. Our systems are designed to absorb and automate the vast majority of daily MQC test volume in any pharmaceutical manufacturing facility and can be operated in networked fleets of multiple systems per facility or campus to scale up with high-volume manufacturing.

MQC is a ubiquitous and critical testing process, executed daily at massive scale globally, that ensures pharmaceutical manufacturing facilities and products are free of microbial contamination from exogenous microorganisms such as bacteria, mold, and other foreign substances. MQC ensures the safety of final drug products released for patient use, via the constant testing for microbial contamination of raw materials, production environments, personnel, and in-process and final sterility testing for drug products. A single drug production facility may conduct anywhere from tens of thousands to over one million MQC tests per year to ensure product quality. This testing is mandated and closely monitored by the U.S. Food and Drug Administration, or FDA, and other global regulatory agencies to ensure the safety of all pharmaceutical products, with serious regulatory and financial consequences for lack of compliance. Companies that have failed to pass FDA MQC audits have been subject to repeat FDA Form 483s, warning letters, complete response letters, or CRLs, extended plant shutdowns, and substantial product scrap and remediation costs. An FDA Form 483 is issued by the FDA at the conclusion of an inspection for conditions that may constitute violations of the Federal Food, Drug, and Cosmetic Act or other laws and regulations enforced by the FDA.

The traditional method of MQC testing, or the traditional method, also known as the compendial method, involves detection of viable, potentially contaminating organisms by a process known as “growth promotion.” In this method, samples are manually collected on media plates, hand labeled and inventoried, physically transported to a centralized lab, and incubated at various temperatures for days to weeks. MQC specialists then visually inspect these plates manually, counting colonies of microbial organisms and recording their counts of thousands of plates by hand, which is a repetitive process predisposed to operator miscounts. In total, the traditional method can require 15 individual processing steps per sample. The benefit of this long-standing method is that it is trusted—a colony growing on media strongly implies the existence of viable, potentially contaminating organisms growing in the location or sample from which the assay was collected.

However, the manual traditional MQC method has become antiquated and is unable to match the growing scale of global pharmaceutical manufacturing—especially complex bioprocessing of biologics, cell, and gene therapies—principally because the process is slow to deliver results, entirely dependent on human labor, subject to technician fallibility and error, unsecured, and non-compliant with data integrity regulations. In time-sensitive, highly regulated pharmaceutical manufacturing operations, these process vulnerabilities can expose organizations to significant operational, financial, and reputational risks, including loss of valuable product batches, reduced manufacturing capacity, lengthy regulatory investigations, costly enforcement actions, and delayed release of life-saving products.

Our Growth Direct platform improves the traditional MQC process, maintaining the fundamental trusted method of growth promotion, but applying advanced robotic automation, powerful optical imaging, algorithmic vision analysis, and data management to render it more scalable and efficient for the future of advanced pharmaceutical manufacturing. Our proprietary technology works by replacing human counting of growing colonies with software and algorithm detection and counting based on image analysis. We exploit the natural autofluorescent properties of microbial organisms to count microcolonies by detecting minute changes to their brightness over time using proprietary vision algorithms, without any new reagents or additional sample prep. Our system wraps this core detection technology with fully automated, high-volume, walk-away robotic sample handling and incubation, locked behind a secured interface that enables compliance with data integrity regulations.

We believe the MQC market is poised for disruption and modernization via the widespread deployment of our Growth Direct platform, and we have embarked on the mission of transforming the MQC test market to standardize on our fully automated solution.

The Growth Direct platform fully automates and digitizes the process of pharmaceutical MQC and enables our customers to perform this critical testing process more efficiently, accurately, and securely. Our platform comprises the Growth Direct system, proprietary consumables, lab information management system, or LIMS, connection software, and comprehensive customer support and validation services. Our Growth Direct system is a fully automated, high throughput instrument for daily processing of MQC samples on our proprietary consumables—a microbiology quality control lab in a box. We have achieved an automated method that is faster and produces more accurate, reliable and accessible data than the traditional method. Growth Direct delivers faster results in half

the time, and with its higher testing throughputs and capacity can absorb the vast majority of daily MQC testing in any facility. Our system increases accuracy and efficiency through full automation of the MQC process. Customers depend on Growth Direct's robust security, connectivity, and data integrity capabilities, reinforced by its high reliability with >99% uptime.

We believe we are the first company to solve the existing barriers to MQC automation. Our product platform reflects our expertise at innovating and integrating across multiple technology disciplines, including systems design, robotic handling, microbiology, optical imaging, software image analysis, data management and security, and process automation. Our business was specifically built to meet the needs of pharmaceutical manufacturing and has developed a track record of delivering reliable results for our customers, which is why we believe we are the trusted standard in microbial automation.

On a global scale, we estimate nearly 350 million MQC tests are conducted annually in thousands of dedicated pharmaceutical manufacturing facilities responsible for producing billions of doses of therapeutics every year. We estimate our total addressable market, or TAM, to be approximately $10 billion in 2021, which we expect to grow to over $14 billion by 2026. Our TAM includes both a system sales opportunity and a recurring opportunity from sales of consumables and service contracts, the latter of which is estimated to be approximately $5 billion in 2021. As we embed our products within global pharmaceutical manufacturing operations and begin to automate and digitize their workflows, we believe our platform is exceptionally well-positioned to enable the future of quality control automation and unlock further significant TAM expansion opportunities.

We employ direct commercial and service teams that drive the adoption of our products globally. We create a superior user experience from pre-sales, to onboarding, consultative validation services, onsite technical training, and continued customer support throughout our relationship. We have a scalable commercial infrastructure including a direct sales force in North America and Europe. This is supplemented with an extensive and highly specialized customer service and validation infrastructure. This infrastructure ensures successful on-boarding of the Growth Direct through both initial validation and follow-on purchases throughout the entire customer site network, where the highest volume sites may require dozens of Growth Direct systems. We currently have customers across approximately 70 sites in 14 countries and the majority of our customers have multiple Growth Direct systems and have deployed Growth Direct across multiple facility locations.

We launched the latest generation of the Growth Direct system in 2017 and have placed over 100 systems and sold over 1 million consumables globally. Our customer base includes over half of the top twenty pharmaceutical companies as measured by revenue and the manufacturers of 30% of globally approved cell and gene therapies. Once installed and validated in our customers' facilities, Growth Direct provides for recurring revenues through ongoing consumables and service contracts. Based on the significant value that our Growth Direct platform provides to our customers, we have experienced strong organic growth over the last two fiscal years, despite the impact of the COVID-19 pandemic, resulting in combined product and service revenue of $11.5 million and $14.1 million for the fiscal years ended December 31, 2019 and 2020, respectively, representing an annual growth rate of 22.9%. We generated net losses of $21.2 million and $37.1 million for the years ended December 31, 2019 and 2020, respectively.

We seek to establish Growth Direct as the trusted global standard in automated MQC by delivering the speed, accuracy, security, and data integrity and regulatory compliance that our customers depend on to ensure patient safety and consistent drug supply.

Industry background and challenges

MQC overview

MQC is the principal method by which pharmaceutical manufacturers ensure the ongoing sterility of their facilities and finished products by detecting and stopping contamination from any outside microorganisms, such as bacteria, mold, and other foreign substances. MQC is a critical component of the bioprocess and pharmaceutical production process and is regulated and mandated by the FDA under current good manufacturing practice, or

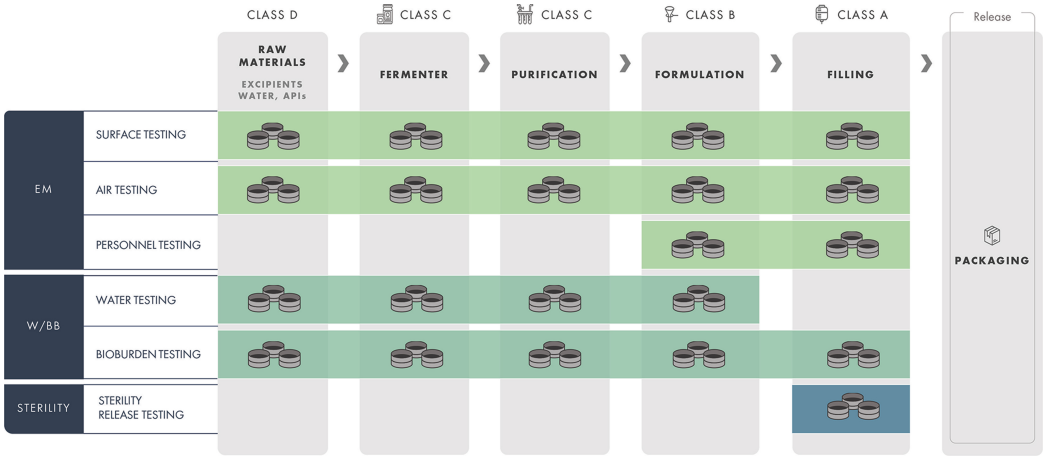
cGMP, and by other international regulatory agencies. Current MQC testing methods are manual, laborious, have lacked innovation over the past several decades.

Most bioprocess and pharmaceutical manufacturing processes follow a conventional high-level workflow:

1. **Raw Materials:** Raw materials such as excipients, active pharmaceutical ingredients, or APIs, and water are received and prepared.
2. **Upstream Processing:** These raw materials are combined and transformed through various processing steps to produce drug product.
3. **Downstream Processing:** The drug product is formulated and aliquoted into its dosage form in a fill / finish operation.
4. **Fill/Finish:** Finally, finished doses are packaged and prepared for release.

These process steps occur in manufacturing suites in ISO designated clean rooms, with increasingly stringent controls denoted by escalating cleanroom class (with Class A the most controlled), as the process nears final product release.

Pharmaceutical manufacturing workflow



To guarantee the quality of the end products and the safety of patients who receive them, manufacturers must ensure that their products are free of potentially harmful microbial contamination. This requirement creates a considerable operational challenge, as the natural environment is rife with microorganisms that could pose serious risk to patients should they transit into these clean rooms and contaminate any aspect of the manufacturing process. Consequently, pharmaceutical companies must maintain strict sterility control in their manufacturing facilities by vigilantly monitoring their sites, equipment, and finished drugs, and responding quickly to any microbial contamination. This is accomplished through MQC testing, which generally encompasses four specific applications for testing of microbial contamination:

- **Environmental Monitoring (EM)**—tests the manufacturing environment, including circulating air, exposed surfaces, and personnel, and represents approximately 65-70% of global MQC test volume;
- **Water (W)**—tests any purified water used at any stage of the drug production process, including water for injection, or WFI, and represents approximately 15% of global MQC test volume;
- **In-Process Bioburden (BB)**—tests raw materials, drug substance and in-process product, and represents approximately 15% of global MQC test volume; and

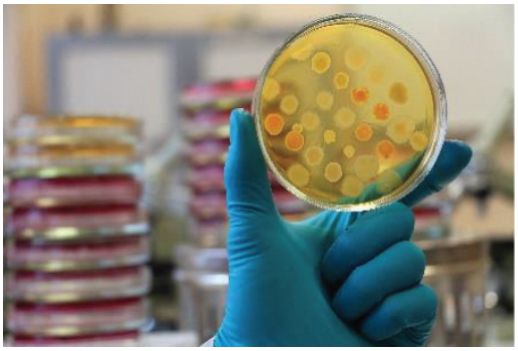
- **Sterility Release (ST)**—final testing of finished product to ensure sterility before the product is released for commercial sale, and represents less than 5% of global MQC test volume.

MQC testing occurs at high volumes due to its importance across all dimensions of a pharmaceutical manufacturing operation and must be executed daily and implemented across all production lines. As a result, pharmaceutical manufacturing facilities may conduct as many as tens of thousands to over one million tests per year.

Legacy MQC techniques and key challenges

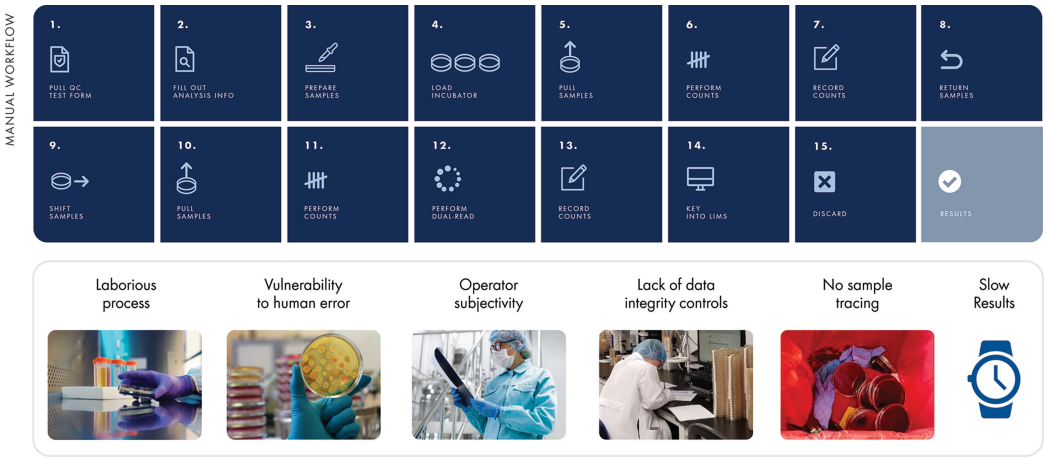
The traditional method of MQC testing, which we estimate accounts for over 95% of all MQC testing, involves detection of viable organisms by a process known as “growth promotion.” In this process, samples are collected from a manufacturing site (e.g., on equipment, water, raw materials) and deposited by various methods onto plates with a matrix (typically agar) containing growth media with nutrients that encourage microbial growth. These plates are hand-labeled, inventoried, and physically transported to a centralized MQC lab. The plates are incubated under various conditions favorable for microbial growth; a manufacturing operation may simultaneously maintain multiple different incubation conditions and processes. If the original sample is contaminated with microbial organisms, the transferred organisms will divide and expand on the test plate, eventually forming visible colonies on the surface of the growth media. Technicians inspect these plates manually, counting colonies and recording their counts by hand. Visualization of colonies indicates the original presence of viable—that is, living—organisms from the sampled location or substance, and a likely microbial contamination for investigation and remediation.

The typical MQC lab today using the traditional method



A typical MQC testing process using the traditional testing method involves 15 or more manual steps per sample, including sample collection, labeling, transport, inventory, incubation, multiple reading and re-incubation steps, final counting, data recording, and data entry. The process is inherently inefficient, with some of the early sample collection steps occurring inside the manufacturing suites spread across a campus, and others centralized in campus MQC labs, requiring sample transport. The manual handling aspect of the traditional method makes it more prone to human error than an automated alternative and can lead to extensive labor and other direct and indirect costs given the thousands to millions of MQC tests required annually per manufacturing facility.

15-step process for traditional microbial MQC method



The traditional method poses several operational problems:

- **Delayed results —** Colonies must grow to a certain size, typically 10 million cells, before the human eye is able to detect them. Across the range of organisms and incubation protocols that facilities handle, this growth time can range from 5-14 days. Until then, no definitive result can be determined, which delays any dependent processes.
- **Test subjectivity —** Once growth has occurred, a human operator will count the colonies and decide whether the number of colonies meets or exceeds their organization's threshold for remediation. However, colonies can grow together or overlap completely, or can be mistaken for other artifacts, confounding operators' ability to generate an accurate, subjective count, especially given the fact that human operators can only check plates a few times during the incubation cycle.
- **Vulnerability to errors —** Operators must manually categorize, label, track and manage numerous plates through a complex multi-step, multi-day process of incubation and analysis, risking the loss or mishandling of samples. Manual analysis of samples also requires human data collection and entry, introducing risk of mistakes during recording and transcription of data.
- **Lack of data integrity and audit controls —** The manual, traditional method of data handling faces challenges in meeting the current regulatory standards requiring data integrity. Current processes, which are often paper based, introduce risk of erroneous or fraudulent data as critical data entry points are reliant on the experience, state of mind, and motives of the individual recording them.
- **Laborious process —** Manual growth promotion is a labor-intensive, multi-step process that requires operators to cycle samples through incubators multiple times per day as they check for growth and often requires physical transport from a manufacturing facility to a centralized lab.

Lapses in traditional MQC processes and potential contamination have resulted in increased regulatory scrutiny and organizational risk, leading to lengthy regulatory investigations and costly enforcement actions in addition to product loss and resulting lost revenue. The risks and costs of inadequate traditional MQC testing include:

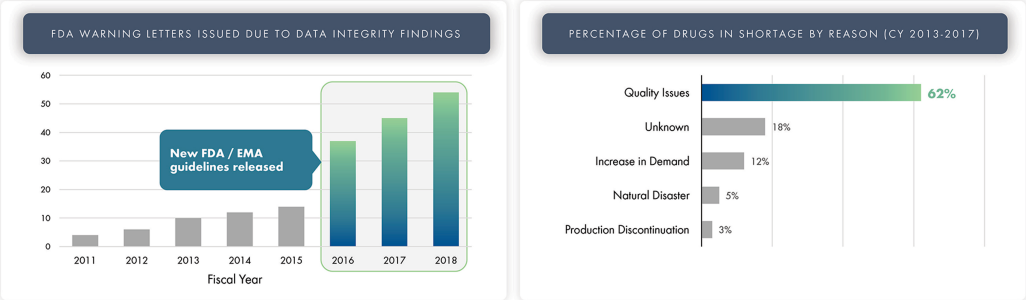
- **Global data integrity risk —** 40-50% of all warning letters issued globally contain a data integrity component.
- **Lengthy regulatory investigations —** The time to resolution of FDA 483s and warning letters is approximately 6-24 months, and even longer in some cases.
- **FDA enforcement action risk —** Risk of significant and costly FDA enforcement actions, up to and including consent decrees.

- **Significant product loss —** Up to $100 million annual product loss per company due to MQC failures has been observed in recent years.
- **Shareholder value destruction —** Potential shareholder value destruction in the hundreds of millions to billions of dollars due to MQC issues, resulting product and financial issues, potential customer concerns, and impact from negative press.

In the last several years alone, there have been numerous publicized incidents involving leading pharmaceutical companies that highlight the risk of poorly controlled, manual MQC testing and protocols, resulting in lengthy site closures, CRLs, and delays to product approvals.

Furthermore, regulatory compliance pressures in the pharmaceutical industry have generally increased over the past decade, with the FDA issuing nearly 780 Form 483s and over 180 warning letters globally for various manufacturing and quality violations in 2019. More specifically, the proportion of FDA warning letters containing a data integrity complaint has risen in recent years, as the agency devotes greater attention to that topic. We expect there to be continued regulatory scrutiny as the industry shifts to more complex biological manufacturing and manufacturing returns domestically.

Increasing industry tailwinds



Key MQC automation growth drivers

We believe several industry trends are driving need for MQC automation, including:

- **Increasing regulatory scrutiny —** Regulatory compliance pressures in the pharmaceutical industry have increased over the past decade, with the FDA issuing nearly 780 Form 483s and over 180 warning letters globally for various manufacturing and quality violations in 2019. Moreover, between 2011 and 2018, FDA inspectors issued more than 180 warning letters related to data integrity problems. Other international regulatory agencies are also defining and increasingly enforcing the highest standards for consistent data robustness, including the U.K. and the World Health Organization.
- **Data integrity and need for remote, real-time monitoring of facilities —** Facing increased data integrity scrutiny from regulatory authorities in their quality control lab and manufacturing areas, pharmaceutical manufacturers must focus on meeting these regulatory requirements as defined by the FDA and other international regulatory bodies. Breakdown of data integrity, even if inadvertent, can result in warning letters, refusal to approve applications, and even product bans from a jurisdiction. Additionally, given the increasingly complex nature of biopharmaceutical manufacturing, there is a growing need to be able to monitor MQC testing in real-time and remotely to ensure the constant quality of production processes.
- **Expansion of high growth biologics and advent of new, more complex therapeutic modalities such as cell and gene therapies —** At $1 trillion in sales in 2021, the global prescription drug market is large and growing, driven by demand for new therapies, such as biologics and cell and gene therapies. The global biologics market is expected to grow at a 9.6% CAGR through 2026 according to EvaluatePharma, and

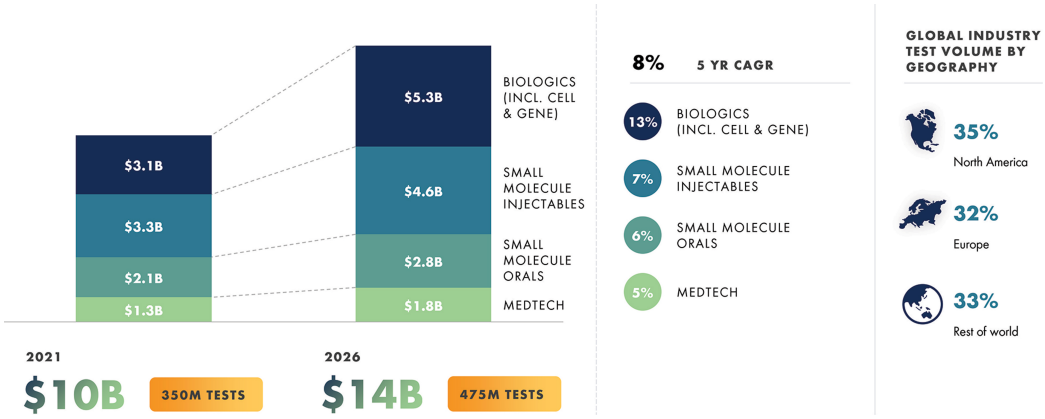
account for 35% of prescriptions and 55% of total revenue of the top 100 drugs, driven in part by the rise in the burden of chronic diseases and growing demand for innovative therapies. Within the biotechnology segment, certain modalities are growing even faster, such as cell and gene therapies, where MQC testing volume is projected to grow at a 10-30% CAGR through 2026. Biologics, cell, and gene therapies require complex multi-step manufacturing processes which demand efficient automated MQC processes. These complex biologics have the highest MQC testing intensity per batch of manufactured product, given that they are often manufactured in a highly modularized fashion where each manufacturing batch often represents an individual dose to a specific patient. These dynamics extend to CDMOs, which continue to benefit from increased outsourcing and the need for contract partners that can manufacture these complex therapeutics.

- **Greater efficiency and focus on six sigma lean manufacturing principles —** The pharmaceutical industry is under significant pressure to commercialize products faster in order to maximize their patent life. There is continued focus on concepts such as lean manufacturing and six sigma to drive efficiencies in the manufacturing process and a greater emphasis on automating MQC testing to reduce errors and decrease manufacturing lead times and inventory requirements in supply chains. The complex nature of emerging biologics and novel therapeutics such as cell and gene therapy also require increased focus on efficiency and precision manufacturing. For example, autologous cell therapies require collection of patient tissue, ex vivo manipulation of these cells, and delivery via reinjection into patients—all steps which must be conducted within a short time span, and with absolute microbiological sterility. Such “vein-to-vein” processes require an intense focus on purity and contamination control throughout every step of the manufacturing workflow, given the value of the individualized ingredients and fast turnaround time required to deliver the therapy back to the patient.
- **Rebuilding of domestic growth supply chain / increased scrutiny of outsourced materials with focus on reshoring drug development process —** The pharmaceutical industry has historically embraced a global supply chain which has provided cost advantages made available by offshoring certain services, such as drug and API manufacturing. However, many companies are pushing to re-shore their global supply chains to resume domestic manufacturing, in part driven by recent supply chain disruptions from the COVID-19 pandemic as well as the potential for geopolitical and intellectual property infringement risk. We believe the reshoring of manufacturing operations will further necessitate the need for efficient automated MQC testing.

Market opportunity

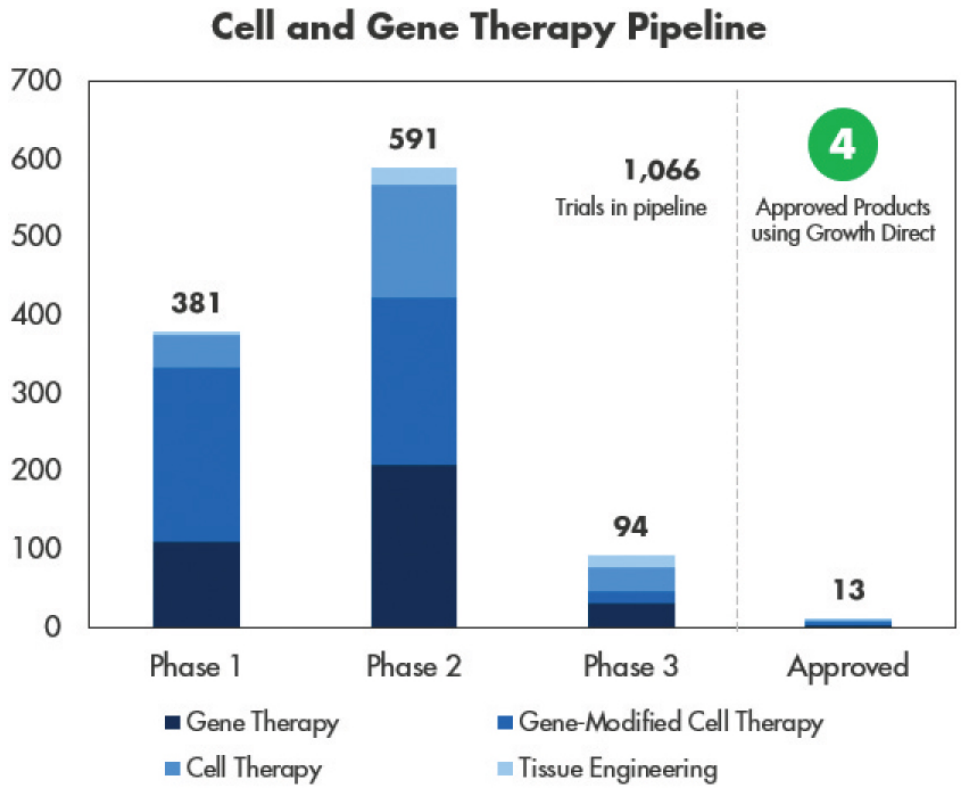
Our core market of MQC testing encompasses a ubiquitous and high-volume testing process deployed across all pharmaceutical manufacturing operations. We address a total systems, consumables, and services market that we estimate to be approximately $10 billion in 2021 and is forecasted to grow at an approximate 8% CAGR to over $14 billion by 2026. We based our estimated TAM on total potential demand for our products derived from research we commissioned conducted by Health Advances LLC and our current pricing. Our TAM includes both a system sales opportunity and a recurring opportunity from sales of consumables and service contracts, the latter of which is estimated to be approximately $5 billion in 2021. We estimate that our global addressable MQC testing market represents approximately 350 million MQC tests annually in 2021 and is expected to grow at a CAGR of 8% to a total of approximately 475 million tests by 2026. This aggregate test volume is composed of MQC testing across several addressable end markets, including biologic therapeutics such as cell and gene therapies, vaccines, and protein therapies (approximately 125 million annual MQC tests); small molecule orals (approximately 90 million annual MQC tests); small molecule injectables (approximately 100 million annual MQC tests); and medtech products (approximately 35 million annual MQC tests). We serve this market across three geographic territories: North America, which accounts for approximately 35% of the global MQC testing market, Europe (approximately 32%), and the rest of the world (approximately 33%).

Our core total addressable market



We are especially focused on serving the high-growth biologics, cell, and gene therapy markets, which have the highest MQC testing intensity per batch of manufactured product. We seek to drive substantial growth by establishing Growth Direct as the standard for MQC automation in advanced bioprocessing for biologics, cell, and gene therapies. MQC testing for these complex therapeutics modalities is forecasted to grow at a 10-30% compounded annual growth rate through 2026. Because these advanced modalities require complex multi-step manufacturing processes with individualized batches and increased product handling, we believe traditional MQC will not scale efficiently to serve this end market, and that the Growth Direct is well positioned to address this opportunity. The need is further highlighted given we have observed an increased scrutiny by regulators and concerns over data integrity, particularly for complex therapeutic manufacturing where MQC is still dominated by legacy, manual processes. We estimate MQC testing for biologic therapeutics will grow at a 13% CAGR from 2021 through 2026. As the sector continues to witness significant advancement, we estimate that nearly 50% of our total TAM growth through 2026 will be driven by the biologics, cell, and gene therapy end markets. Within the cell and gene therapy category, the need for faster, more efficient manufacturing presents an attractive targeted growth opportunity for Growth Direct. Thirty percent of globally approved cell and gene therapy products use Growth Direct to automate MQC, and the remaining 1,000+ cell and gene therapies in Phase 1 to 3 clinical trials represent a significant opportunity for our business.

Cell and gene therapy market and pipeline



Our business is further well-positioned to execute on several TAM expansion opportunities. We believe there is an opportunity to expand our existing automated MQC testing solution in adjacent markets such as personal care product manufacturing, where our Growth Direct platform is currently in use and which we estimate presents an approximately $8 billion opportunity with an estimated 270 million MQC tests annually. We based this estimated TAM on total potential demand for our products derived from research we commissioned conducted by Health Advances LLC and our current pricing. We also intend to develop services and products to allow us to deliver integrated QC workflows not currently addressed by our Growth Direct platform, which we estimate represents an approximately $10 billion opportunity. We based this estimated TAM on potential demand derived from our own market research and current pricing of comparable integrated products in other markets. Combined with our core TAM, we believe these expansion opportunities could increase our potential TAM to $32 billion.

The Growth Direct platform

Our proprietary Growth Direct platform fully automates and digitizes the trusted growth-based method of MQC and enables customers to perform this critical testing process more efficiently, accurately, and securely. Our platform comprises the Growth Direct system, proprietary consumables, LIMS connection software, and comprehensive customer support and validation services. The platform's suite of products reflects our expertise at innovating and integrating across multiple technology disciplines, including systems design, robotic handling, microbiology, optical imaging, image analysis, data management and security, and process automation, and is supported by our unwavering commitment to the highest level of customer support.

Our technology

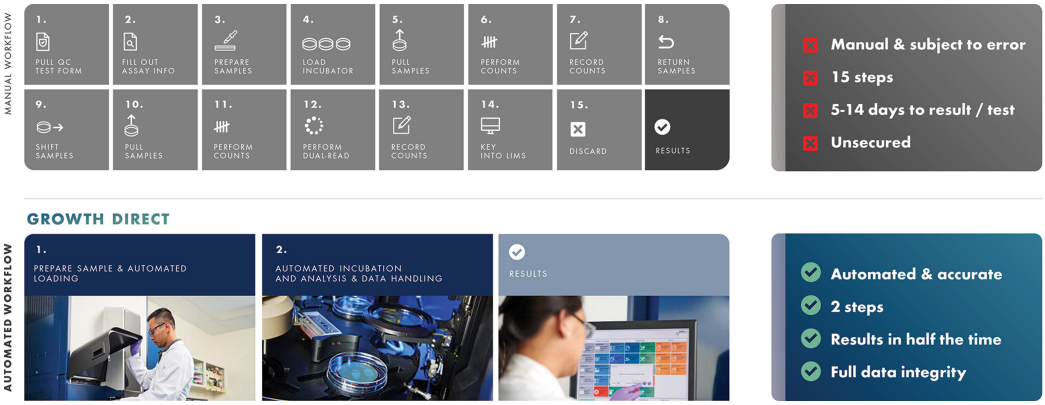
To date, prior technology products have not succeeded in automating MQC workflow at scale, due to a combination of insufficient platform throughput, lack of full automation, and non-viable technology approaches. Most testing

solutions on the market that seek to replace the traditional method diverge from directly measuring microbial growth, using alternative analytical technologies that often require additional reagent preparation and that do not deliver the same results as the existing traditional method. These methods are difficult to validate relative to the traditional method and have therefore seen low adoption across the industry.

Growth Direct method

The Growth Direct method relies on a fundamental property of all microorganisms—they contain cellular components required for growth, called flavins and flavoproteins, that autofluoresce, or glow, without the addition of reagents under certain frequencies of light. Our proprietary system detects microcolonies of microorganisms by illuminating them with blue-spectrum light and directing the resulting green-spectrum signal onto a Charged-Coupled Device, or CCD, chip—an array of independent photosensitive pixel elements. Our image analysis software interprets these light signals and counts the clusters of illuminated pixels representing each microcolony. The end result is an automated method that is faster and produces more reliable and accessible data than the traditional method. Our Growth Direct platform accelerates time to results by several days, a 50% improvement over the traditional method, and reduces MQC testing to a simple two-step workflow, eliminating 85% of the manual steps of traditional MQC, generating significant time, operational, and cost savings for our customers.

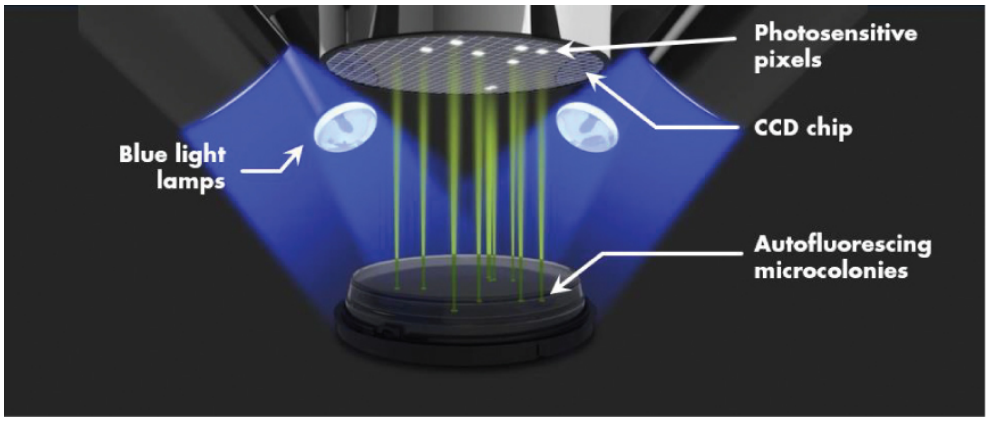
Traditional microbial method compared to Growth Direct method



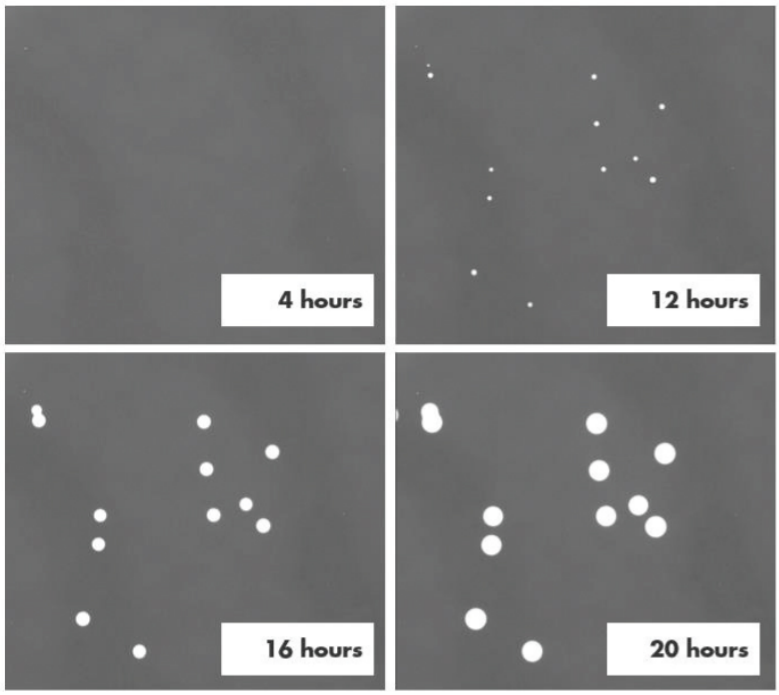
Core detection technology

Our system illuminates samples using an array of high-intensity blue LED lights, which causes microcolonies to autofluoresce without destroying them. All microbial cells autofluoresce in the green-spectrum when illuminated with blue LED light. A CCD chip captures images with illuminated pixels wherever autofluorescence from microbial cells is detected. Our software detects and registers the clusters of illuminated pixels that represent underlying microcolonies. The system generates a time series of images as the sample incubates and is imaged every four hours. Finally, vision analysis software continuously evaluates the time series for evidence of growing colonies, represented by increasing signal intensity and size of illuminated groups of pixels.

Illumination of a sample via a blue LED light causes microcolonies to fluoresce



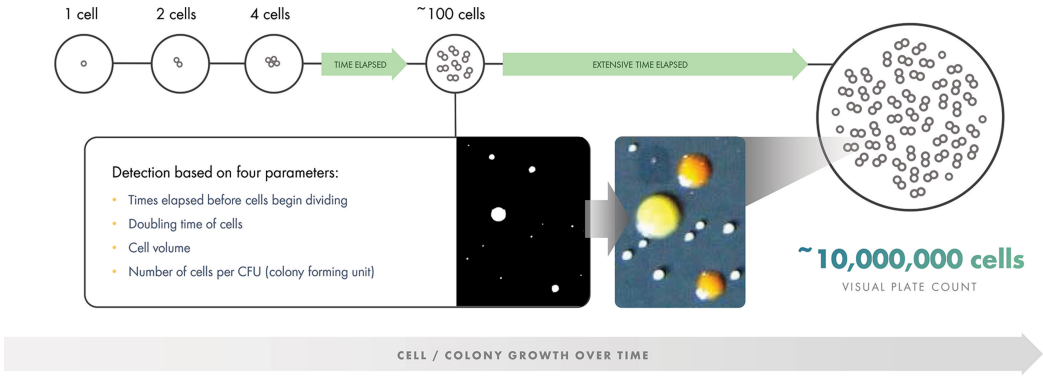
Growing autofluorescent *S. aureus* microcolonies in Growth Direct imaging time series



A key feature of detection via imaging of autofluorescence is that this approach does not harm cells, and as such is a non-destructive method. This provides several benefits, including ensuring that detected colonies represent actual viable microbial contaminations, and permitting detected microcolonies to grow into visible colonies for use in subsequent microbial identification for root cause investigation follow-up.

Our platform can detect microorganism growth at the microcolony stage at approximately 100 cells, which typically occurs in half the time required for visual plate counting to detect visible colonies by eye at approximately 10 million cells.

Growth Direct finds colonies earlier than operators using visual plate inspection.

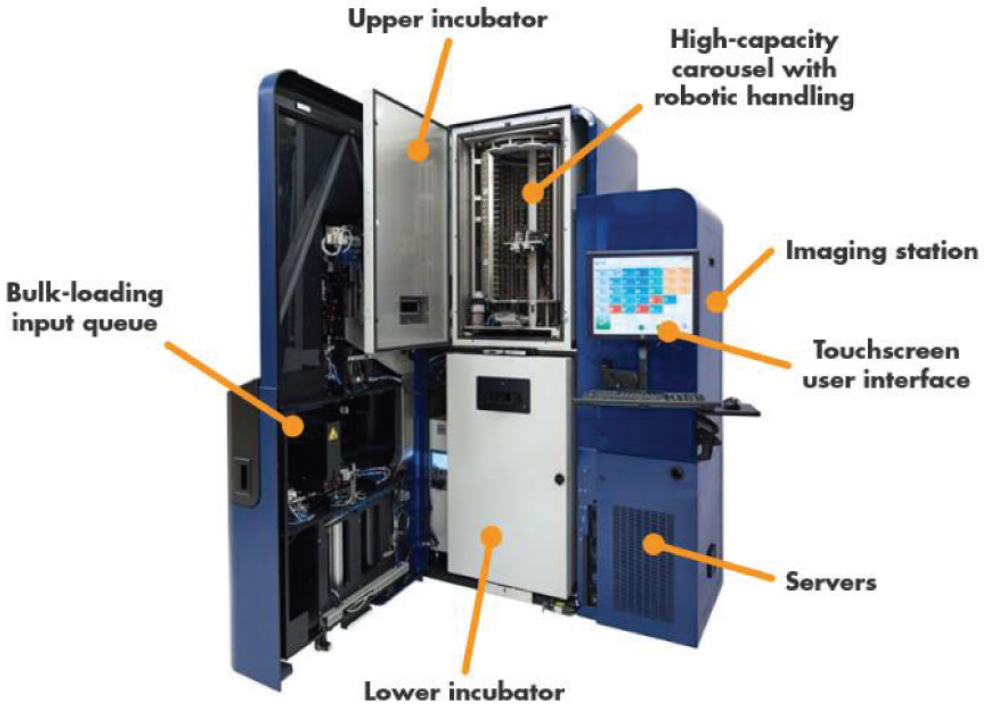


System components and workflow

The Growth Direct system comprises two automated and temperature-controlled incubators, robotic sample transport systems, an advanced imaging system, two servers (one for system control, the other for image analysis) and associated hardware and staging required for the handling of up to 700 of our consumables.

The overall workflow of the automated Growth Direct method mirrors the traditional visual plate counting assays, allowing for operator familiarity of use, ease of integration into existing MQC protocols, and a streamlined regulatory validation process.

Growth Direct system components



The Growth Direct workflow begins when microbial organisms are collected on proprietary growth media plates using the same collection methods as the traditional method—via direct contact, air settling or air filtration for

environmental monitoring testing, or via funnel filtration of liquid samples onto the membrane of the consumable for water or bioburden testing. For ease of use, our consumables are compatible with existing hardware, such as active air samplers or liquid filtration systems, and are supplied by us with identical nutrient agar media as traditional media plates.

A Growth Direct operator loads the system in bulk using two carriers designed to hold up to 60 of our consumables each. A key benefit of the Growth Direct is that the system can be placed directly in a production area, compared to the traditional method which often requires transporting samples to a centralized lab for testing. Our consumables are pre-labeled with unique bar codes for forensic trail identification, management and to enable data integrity compliance. Every consumable bar code contains a unique serial number that allows traceable information to be captured by two bar code scanners on the Growth Direct system. That allows metadata such as sample location, time, type, test protocol, and operator to be captured and associated with each consumable result. Intake sensors within the system automatically read, identify, and catalog the bar-coded samples, after which the samples are transferred from the loading queue to one of two independently controlled incubators, which together have a capacity of 700 of our consumables, and which support the operation of multiple custom incubation protocols. Once loaded into the system, consumables cannot be removed or tampered without generating an auditable record of actions by an operator.

During the incubation phase, the Growth Direct captures images of each consumable at intervals of four hours. To perform the imaging, the system transfers consumables from the incubator to the imaging chamber, illuminates them using a blue-spectrum light and captures autofluorescence signals in a high-resolution image using the CCD camera. Samples are returned to the incubators to continue their incubation protocols. Automated sample handling means no sample is ever missed for testing or replaced into the wrong incubator or accidentally discarded.

Over the course of the incubation protocol, the system’s image analysis software uses proprietary algorithms to analyze the behavior of autofluorescent objects over an accumulating time series of images, enabling the Growth Direct to identify and count growing microcolonies and distinguish them from non-living debris.

After the image analysis is complete, the system reports the number of growing colonies found on the surface of the consumable. The result data can be printed or transmitted to LIMS via our LIMS connection software for storage and user review. When a sample demonstrates growth that exceeds the threshold for contamination set by the organization, automatic email alerts notify quality personnel of a possible contamination before the end of the incubation period. A powerful yet intuitive user interface allows the operator to track the consumables in the system throughout the testing process and monitor the results in real time, which offers a significant advantage to the manual and traditional method that has to wait to the end of the incubation before counting. After results are reviewed, the consumable can either be unloaded to a carrier for further microbiological identification or automatically discarded as waste at the operator’s discretion.

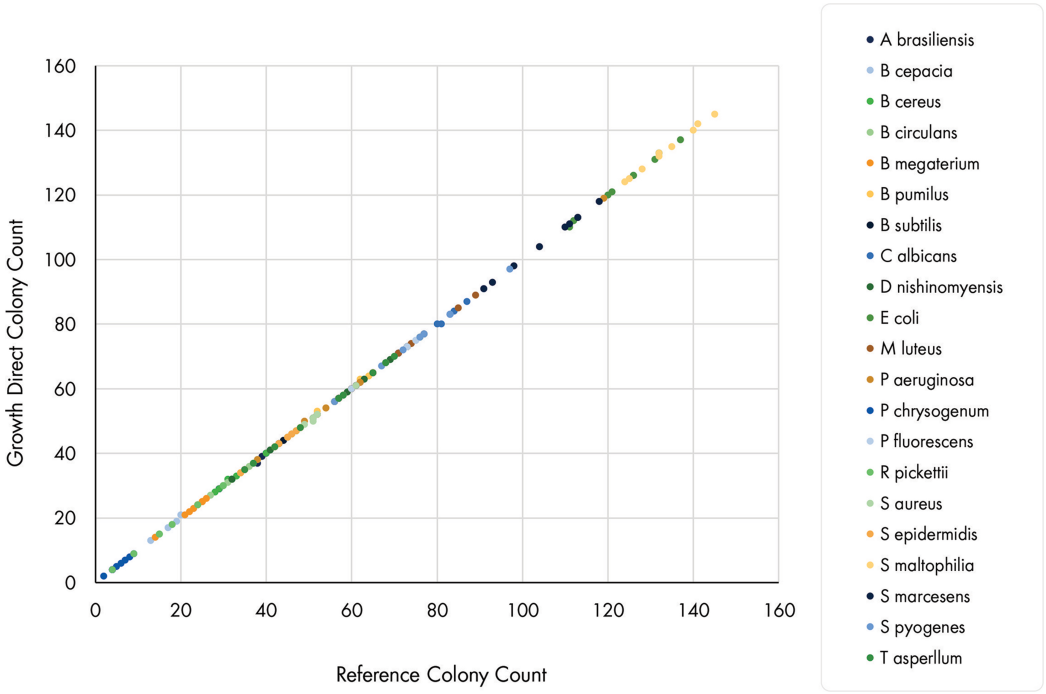
Validation framework

We have demonstrated the accuracy, speed, and reliability of detecting microcolonies using the Growth Direct’s automated image analysis compared to conventional methods through numerous scientific studies.

Accuracy. The Growth Direct is highly accurate when compared to traditional methods. Studies of the Growth Direct comparing its vision-based detection and enumeration of colonies against the MQC gold-standard USP <61> benchmark reference set of micro-organisms demonstrate that the Growth Direct delivers the same results or better as traditional, manual verification of colonies.

The figure below demonstrates the accuracy of the Growth Direct imaging and analysis technology compared to a reference count produced by an analyst interpreting the image data created by the software. A wide range of organism types—both mandated by the United States Pharmacopeia, or USP, and those commonly found in pharmaceutical facilities—were evaluated.

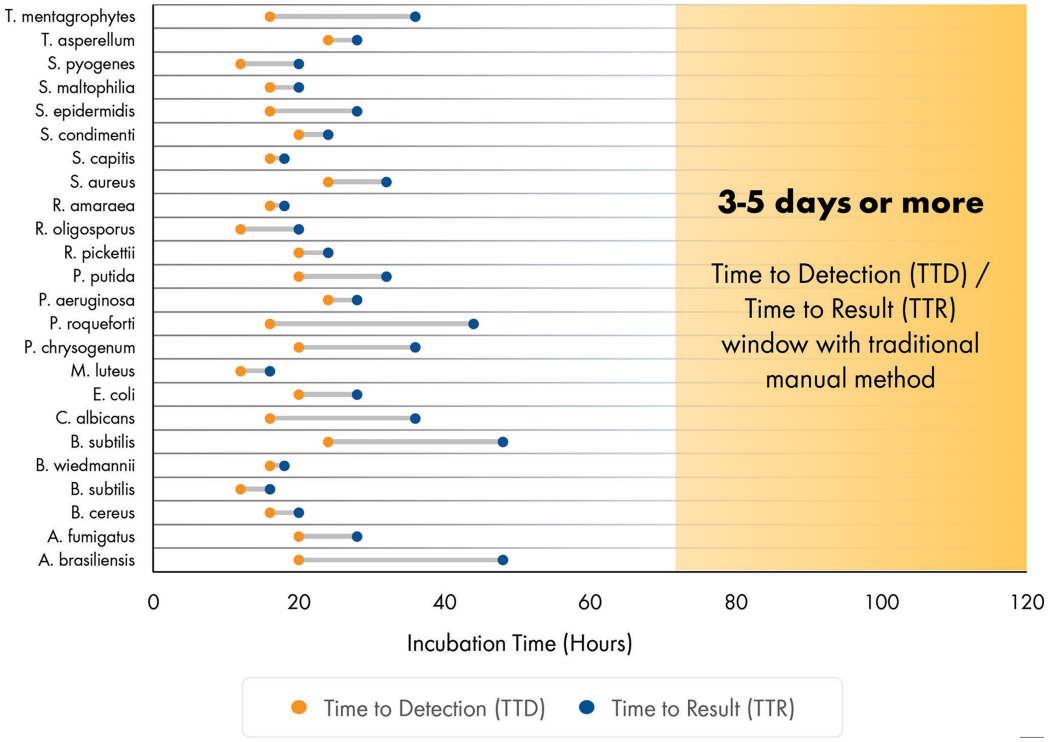
Growth Direct colony count accuracy vs. standard reference



Speed. The Growth Direct is faster than the traditional method. Across a range of organisms of interest, the Growth Direct detects colonies in half the time or faster.

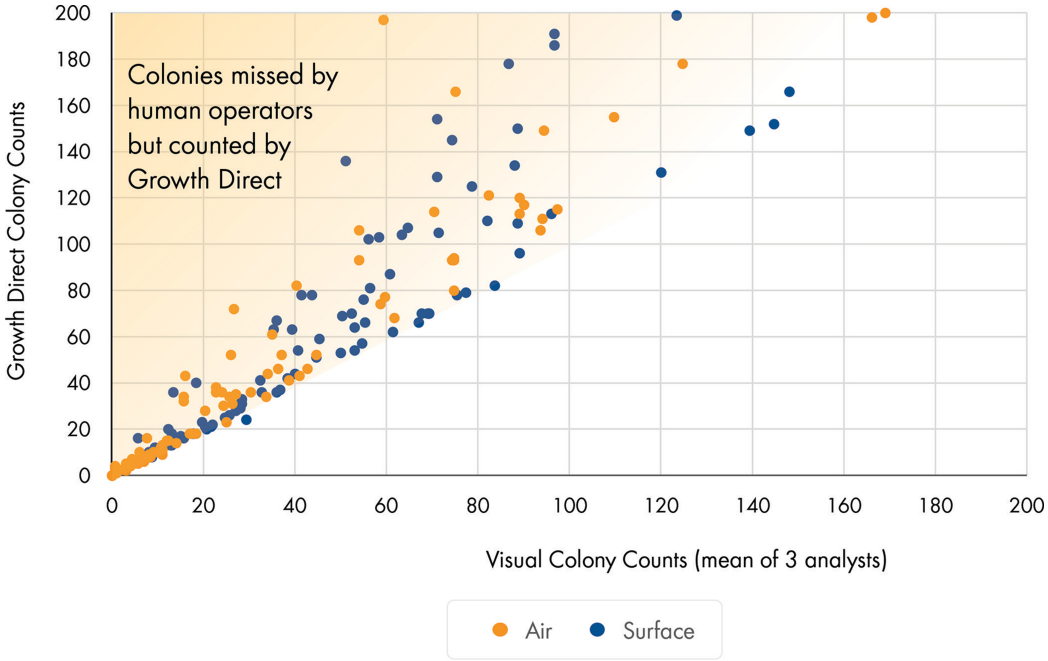
The figure below shows the time to detection, or TTD, and time to result, or TTR, in hours for a wide range of pharma lab-relevant microorganisms using the EM application on the Growth Direct system compared to the TTD/TTR window using traditional manual tests (72+ hours).

Growth Direct time to result vs. traditional method



Reliability. The Growth Direct is more reliable than the traditional method for accuracy of organism enumeration. In studies of environmental monitoring plates incubated for five days, which compared Growth Direct's vision-based detection and enumeration to visual counting conducted by technicians, the Growth Direct regularly identified and counted colonies that technicians missed, as shown by the counts in the shaded area in the figure below.

Growth Direct colony detection reliability vs. traditional method



Our Growth Direct platform

We pioneered the Growth Direct platform—a combination of our novel Growth Direct system, proprietary consumables, LIMS connection software, and comprehensive customer support and validation services—to fully automate and digitize the process of MQC in the sterile manufacturing of important health care products.

The Growth Direct system

Our latest version of the second-generation Growth Direct, launched in 2017, reflects our deep experience with delivering automation to the MQC market. The Growth Direct system is a fully automated, high throughput system for processing MQC samples—a microbiology quality control lab in a box. The Growth Direct contains two high-capacity incubators, an advanced imaging system and internal robotics for sample handling. The system enables walk-away bulk sample loading, holding 700 of our consumables per system. Its dual, independently controlled incubators automatically manage multi-temperature incubation protocols. Onboard imaging and vision software detects and counts microbial growth, delivering test results in half the time of the manual method. The system's compact 57" x 39" x 95" size delivers these benefits in a footprint that allows customers to place the Growth Direct directly in manufacturing suites of various sizes compared to the traditional method, where samples are often required to be transferred to a centralized lab. Co-location in manufacturing minimizes delays to incubation and errors introduced by sample transfer to the QC lab. Growth Direct brings the lab to the manufacturing floor, for in-line / at-the-line automated MQC testing, anywhere in the facility or manufacturing campus.

The Growth Direct system

Proprietary consumables

We offer two proprietary consumables plates to capture test samples for analysis on the Growth Direct: (1) an Environmental Monitoring, or EM, consumable and (2) a Water / Bioburden, or W/BB, consumable. Both types are custom-designed proprietary consumables with specific mechanical and optical features to facilitate automated handling and image processing within our Growth Direct system and have bar codes for tracking and data integrity. Two bar codes are used—one applied during our manufacturing process to define the media type and expiration dates, and a second that is generated by the Growth Direct system at time of testing that defines the sample ID and LIMS number. The consumables incorporate multiple standard media for each application as both products are based on the traditional growth method.

Growth Direct Environmental Monitoring and Water / Bioburden consumables

Environmental Monitoring Consumable

Water / Bioburden Consumable

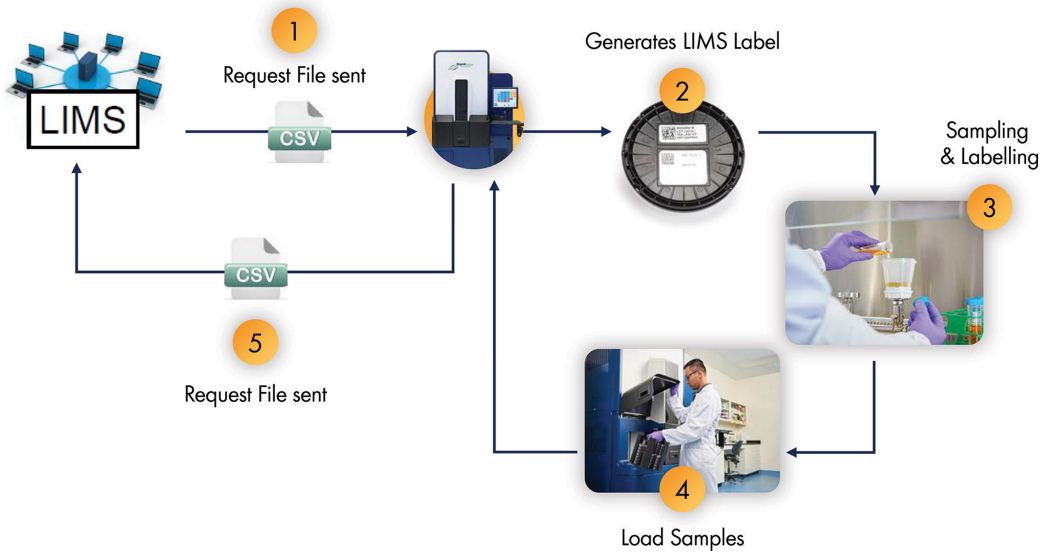
In addition, we are developing a growth-based rapid automated sterility test for use on the Growth Direct system. Rapid sterility tests are utilized for final release testing in any facility that manufactures sterile products such as biologics and sterile injectables, as a final quality check before shipment. The traditional sterility test utilizes a growth method that requires at least 14 days to deliver final results, during which time dependent manufacturing steps are paused or proceed at risk, or final products are held in inventory. This causes delays to patient access and manufacturer revenue recognition as well as excess inventory costs. Sterility tests are especially valuable in vaccine manufacturing to enable faster release and greater capacity, and in cell and gene therapy manufacturing environments given the challenging balance of purity, contamination control, and speed required in the manufacturing of those products. For example, vaccine production requires two or more sterility tests during manufacturing, each of which imposes a 14-day delay on the production process. In total, release of critical vaccines can be delayed by months. Similarly, autologous cell therapies require collection of patient tissue, *ex vivo* manipulation of these cells, and delivery via reinjection into patients — all steps which must be conducted within approximately two weeks, which the traditional method of sterility testing exceeds, causing delays or requiring release of the product at risk.

When commercialized, we expect our rapid sterility test will reduce the traditional method's 14-day time to results by at least 50%, permitting faster final release, with the goal of speeding critical drugs and vaccines to market. When released, we expect our rapid sterility test will also deliver the other benefits of the Growth Direct platform, including increased efficiency, reduced risk of errors, and enabling data integrity compliance. Our development program is supported by contract funding from U.S. Department of Health and Human Services Biomedical Advanced Research & Development Authority, or BARDA, which is supporting the development of improvements in vaccine production methods that accelerate the availability of vaccines against viruses with pandemic potential.

Growth Direct LIMS connection software

Our Growth Direct allows for two-way integration to LIMS enabling a fully paperless workflow. The bi-directional LIMS connection uses the widely supported comma-separated values, or CSV, file format to communicate, delivering compatibility with all existing LIMS. The connection supports the use of LIMS for Growth Direct created barcodes that are applied to our consumables. After sampling, the consumables are loaded into the Growth Direct system, which performs the incubation, detection and enumeration of colonies. Final results are automatically uploaded to the LIMS. This eliminates the risk of human error that could arise from manually entering the results, while improving efficiency. Moreover, the LIMS connection eliminates the need to use paper in the lab and delivers information to stakeholders in a secure manner, designed to enable compliance with data integrity regulations.

Growth Direct LIMS connection



Our service team works directly with customers' IT teams to help integrate Growth Direct software into their LIMS for seamless connectivity.

Validation services

As part of our customer support experience, we offer full validation support to ensure customer success with the Growth Direct. This offering helps our customers validate their Growth Direct for full routine use faster, typically in just three to nine months, and develops confidence in the operation of our platform.

Support begins prior to system purchase when our sales representative brings in a validation expert for consultation about specific application requirements. The validation teams offer a complete array of documents and services to support validation efforts, including:

- Installation Qualification
- Operational Qualification
- Performance Qualification
- Time-To-Results Qualification, or TTR
- 21 CFR Part 11 Assessment
- Method Qualification/Method Suitability

Once initial systems are validated, our customized validation approach allows customers to quickly validate follow-on systems through a Technical Transfer Method, facilitating faster adoption throughout their site network.

Customer support

We offer full 24/7 maintenance support via our annual service contract. Purchase of the Growth Direct comes with one-year warranty, after which customers may purchase annual maintenance packages. Our maintenance support package offers access to a staffed online and phone help desk with knowledge base, remote management and troubleshooting, and a 24-hour response time from our on-site field service engineer team.

Key advantages of our Growth Direct platform

Several factors differentiate our technology and will continue to be significant drivers of customer adoption of Growth Direct:

- **Faster Results at Higher Testing Throughputs and Capacity —** The Growth Direct uniquely combines superior detection and enumeration capabilities—translating to a 50% reduction in detection time compared to the traditional method—with a high-throughput, 700-sample total capacity form factor. This allows Growth Direct to offer a large volume automated testing solution that allows for fewer investigations, more targeted interventions, and more uptime for manufacturers, therefore saving time and money.
- **Increased Accuracy through Automation —** The automation of both sample handling and enumeration virtually eliminates human errors from the MQC process. Samples are transferred automatically at the right time, reducing the risk of sample loss, misplacement or mislabeling. The Growth Direct also more reliably distinguishes distinct colonies, hence avoiding the subjectivity that human operators introduce through visual inspection of plates.
- **Increased Process Efficiency —** Faster time to results means faster decision-making and intervention in the event of contamination, preventing production of contaminated batches, and reducing waste and overproduction. Meanwhile, elimination of unnecessary manual labor allows skilled MQC specialists to spend time on test design, interventions, standard operating procedure, or SOP, updates and other critical tasks.
- **Robust Security and Connectivity —** Growth Direct can integrate with existing LIMS, allowing for seamless data transfer from the system to the LIMS. This connection not only makes it easier for quality control

personnel to handle and process their testing data, but it also allows other stakeholders to instantly access information critical to continued production.

- **Superior Data Integrity —** By maintaining accurate, complete, and intact records within their original context, Growth Direct ensures the trustworthiness of data. Moreover, data reside in permanent form for the lifetime of the record, easily accessible to authorized users, which allows operators to analyze trends over time for timely, cost-saving decision-making. The system is designed to enable compliance with industry data integrity standards such as 21 CFR Part 11, which set forth the FDA's standards for electronic records and electronic signatures.
- **High Reliability with Clear Path to Validation —** The Growth Direct delivers the reliability that customers need for their mission-critical manufacturing processes, with a consistent record of over 99% uptime in live production use. Our platform's reliability is further supported by our 24/7 support infrastructure and extensive regulatory validation services to ensure quick and seamless integration with customer's facilities and IT systems.

Competitive strengths

We believe our continued growth will be driven by the following competitive strengths.

- ***Our proprietary technology platform offering best-in-class automated and secure MQC testing —*** Our platform was purpose built to meet the growing demands posed by the increasing scale, complexity, and regulatory scrutiny of global pharmaceutical manufacturing. We believe that our Growth Direct leads the industry in throughput, accuracy, reliability, security, and data integrity. Compared to the traditional method, our Growth Direct platform accelerates time to results by several days, a 50% improvement over the traditional method, and reduces MQC testing to a simple two-step workflow, eliminating 85% of the manual steps of traditional MQC, generating significant time, operational, and cost savings for our customers. Growth Direct is backed by our comprehensive validation and value-added service offerings, which create a continuous, positive touch point with our customers. Altogether, we believe our technology and service platform best address the growing needs of our customers.
- ***Our investment and patent-protected innovation across multiple technology disciplines —*** Our platform reflects our expertise at innovating and integrating across multiple technology disciplines, including systems design, robotic handling, microbiology, optical imaging, software image analysis, data management and security, and process automation. Through multiple years of development and investments from both investors and institutional partners, such as BARDA, we have amassed a core set of technologies that form the foundation of our growing suite of products and solutions. We also believe that our first mover advantage in automated MQC testing reinforces our growing position in this market, with over 15 years of customer development and feedback, technical development, advocacy, and customer success. We continue to focus on investing in our business and have a well-defined product roadmap which includes development of new, innovative products, as well as advancements to our existing suite of technologies. Moreover, we have a strong intellectual property portfolio, including at least thirty issued or granted patents globally with eight U.S. issued or granted patents and thirty-nine pending patent applications globally with seven U.S. pending patent applications as of March 15, 2021.
- ***Top-tier customer partners establishing Growth Direct as an industry standard globally —*** We have cultivated long-standing and collaborative relationships with our significant and growing customer base. We originally developed our platform in close collaboration with our customers, and our customers' success in validating our technology constitutes a major driver for platform deployment. Moreover, our comprehensive validation, value-added service, and customer support offerings create a continuous touch point with our customers, cementing the value and integration of our products. Through these efforts, we deliver high quality experiences at every step of the customer journey which creates and strengthens our customer loyalty.
- ***Deep integration into heavily regulated pharmaceutical manufacturing processes —*** Our products are entrenched within our customers' workflow and the majority of our customers have purchased multiple

systems and at multiple locations. For every drug product manufactured or in development, our customers are required to establish a validated QC process that they can execute consistently and reliably. Customers typically dismantle manual testing infrastructure after switching to our platform, creating enormous switching costs that get amplified by the network effect of linked systems and data aggregation across customer sites. Since initial installation, our relentless focus on providing robust validation support ensures assimilation of our platform into our customers' SOPs, further contributing to customer captivity. We believe that our first mover advantage has further enabled us to become deeply rooted within our customer's facilities and provide for ongoing opportunity with our existing customer base.

- ***Our highly attractive business model that leverages our growing installed base of systems to generate persistent recurring revenues through consumables and service contracts —*** Once embedded and validated in our customers' facilities, our Growth Direct provides for recurring revenues through ongoing consumables and service contracts. When our customers invest in our technology, they commit to a long-term use of our products. Our customers regularly purchase our proprietary consumables to perform MQC testing and maintain their systems via annual service contracts. Our products are used daily in our customer's facilities and their key workflows, reinforced by regulatory requirements that are driving the industry towards further automation. Once validated, additional systems can be deployed to absorb the majority of test volume in a facility. Moreover, once a Growth Direct system is installed within a customer's facility, it provides for an opportunity to place additional systems in existing and new facilities, which can be installed and validated in a faster, more efficient manner given the comprehensive validation process for the initial system.
- ***Ability to leverage our extensive regulatory expertise to better serve our customers' needs—*** We believe we are a thought-leader with respect to regulatory requirements. We have a long history engaging with the major regulatory bodies in our industry, such as the FDA and European Medicines Agency, or EMA, some of whom are also our customers. Our regulatory strategy has benefited our business in several ways, including: 1) by achieving the definition of the Growth Direct Technology as an "automated compendial validation" in key trade group and regulatory issuances, such as the Parenteral Drug Association, or PDA, Technical Report 33, and USP chapter <1223>; 2) by working with industry and regulatory forums to define a fast validation strategy that allows a short timeline routine testing implementation; 3) and by helping our customers obtain regulatory acceptance from the EMA and the FDA for the use of our technology and validation strategy for new drug applications with the Bioburden application (EM and water do not need regulatory license change). Our technology has also been audited regularly by regulatory inspectors as part of routine audits of customer sites, with no citations received to date. We have also succeeded in securing a substantial long-term government contract from BARDA to support development of new products as part of an ongoing partnership concerning areas of shared strategic interest regarding accelerated pandemic vaccine release.
- ***Our experienced management team and workforce with deep domain knowledge —*** Our management team combines strong subject matter expertise with a demonstrated history of commercial and operational execution. Moreover, our workforce has deep domain knowledge across a range of healthcare, technology and business disciplines, which we believe drives our continued commercial success. We have supplemented our diverse technical experience by assembling an operational team with expertise in manufacturing, legal, sales, marketing, customer service and finance. We believe this confluence of talent from multiple disciplines allows us to stay ahead of our competitors by identifying highly impactful opportunities and building products and solutions that address these opportunities.

Our growth strategy

We aim to position the Growth Direct as the industry standard for automated MQC testing. We believe we can achieve this through the following key growth strategies.

Leverage our first-mover advantage and our industry leadership to cement Growth Direct as the new standard of MQC automation in the rapidly growing bioprocessing market, including biologics, cell, and gene therapy

manufacturing — Our MQC process automation platform is particularly well-suited to the manufacturing of biologics, cell, and gene therapies. These products are manufactured in a highly modularized fashion where each manufacturing batch often represents an individual dose to a specific patient. These therapies are therefore exceedingly valuable, and the manufacturing methods to produce them are time-sensitive and exposed to outsized risk of contamination given the amount of material handling and process change-over. We have demonstrated the value of our platform in cell and gene therapy manufacturing with our early success in converting customers in this segment. Furthermore, companies in this space are developing new approaches to manufacture these complex products, including novel facility layouts, new processes and workflows, and new quality and risk management frameworks. We intend to capitalize on our first-mover advantage to define the standard of MQC automation in this growing market by moving upstream in the cell and gene therapy manufacturing design practice, creating thought leadership on MQC automation in cell and gene therapy manufacturing, partnering with facility design firms who specialize in manufacturing infrastructure for these modalities, and targeting contract development and manufacturing organizations, or CDMOs, CMOs and contract research organizations, or CROs, with significant exposure to this segment.

Drive new customer adoption of the Growth Direct platform by converting the leading manufacturers in our core markets, including but not limited to top 50 pharmaceutical companies and leading CDMOs — With the launch of our latest generation Growth Direct in 2017, over 30 customers have adopted the Growth Direct platform to automate MQC testing in more than 60 manufacturing facilities. We intend to drive global adoption by broadly seeking new customers in our core pharmaceutical manufacturing end markets. Our initial focus is on influential high-volume top 50 pharmaceutical companies as measured by revenue and global contract manufacturing organizations, which provide manufacturing services directly to pharmaceutical companies. Our existing customer base includes over 50% of the top twenty pharmaceutical companies by revenue. Our target geographies include North America and Europe and we are expanding our direct and indirect sales teams to access new customers in other geographic territories, such as Asia.

Expand implementation of the Growth Direct platform within our existing customer base by deploying additional systems across their global manufacturing site network and driving increased application utilization and consumable pull through on a system-by-system basis — We pursue a land-and-expand strategy to drive broad global adoption of our systems. Our approach begins by placing initial systems within our customers' global manufacturing network. The majority of our customers, which comprise over 50% of the top twenty pharmaceutical companies as measured by revenue, have global operations with multiple manufacturing facilities. We guide these initial sites as they gain experience with the Growth Direct, assisting their validation of initial applications, proving the value of our systems, and establishing a relationship as a trusted and reliable vendor. Our system is specifically designed to absorb the daily MQC testing volume at our customer's facilities. We then successfully sell additional systems to support additional suites at existing sites as well as leverage our high customer satisfaction at existing facilities to drive adoption at new sites within our customers' global manufacturing network. The majority of our customers have multiple Growth Direct systems per site and across different facility locations. We accomplish this expansion via direct peer-to-peer selling facilitated by our commercial team, and by partnering with executive decision makers to execute global customer rollout agreements. We simultaneously drive increased utilization on a system-by-system basis by providing our customers our full suite of applications that can be validated and used on the Growth Direct. Moreover, our customers' strong desire to globally standardize and harmonize their MQC operations provides us a direct opportunity to grow with them, and after validating their first system we are able to install and validate more systems globally for them in a much faster time period given the initial validation process.

Increase the value of our platform by innovating and launching new applications, hardware, and software products that deliver the power of integrated automation across our customers' QC workflows — We believe the depth, scalability and robust capabilities of our Growth Direct platform allow us to address key challenges facing MQC testing in the pharmaceutical industry. As an innovative leader in automatic MQC testing, we intend to invest in further enhancements in our existing platform as well as end-to-end workflow solutions in our core market. We have a well-defined roadmap for our existing products, which includes new consumables to expand our platform's MQC testing applications, such as in sterility testing; improvements to on-board algorithms that

enable greater insight from our image analysis; additional imaging modalities to unlock new testing functionality; additional system formats to accommodate new customer use cases; and new software to enable fleet management and analytics. Our product roadmap also includes new products to automate upstream and downstream workflow elements, such as microbial identification and automated sample collection, and data-rich products including data management, fleet integration, and predictive analytics. By expanding and continuously enhancing the Growth Direct platform, we believe we can drive incremental revenue from existing clients as well as broaden the appeal of our solutions to potential new customers.

Expand the Growth Direct platform into adjacent end markets with high volumes of manual MQC testing — We have identified markets that conduct high volumes of MQC testing under regulatory control and derive value from improving operational efficiency via MQC automation and we may opportunistically enter these markets. We could expand into these markets through our existing technologies, through adapting our existing technologies, or through developing new products specific to the unmet needs of adjacent markets. We have identified several market expansion opportunities which we expect to pursue in the near term, including deploying our existing Growth Direct platform into the personal care products market, in which an estimated 270 million MQC tests are performed annually, equating to an overall market of approximately $8 billion. We continuously seek to identify other market opportunities where our Growth Direct platform could enhance MQC testing.

Pursue opportunistic strategic investments, partnerships, and acquisitions — Our strong growth to date has been entirely organic as we continue to add customers to our growing install base of Growth Direct users, while also expanding our consumables and product offering to those customers. At the appropriate stage we may consider opportunistic investments, partnerships, and acquisitions which may strengthen our product platform, allow us to enter new markets, and enhance our growth profile.

Commercial

We launched the latest generation of the Growth Direct system in 2017, which includes the Growth Direct platform and consumables for three applications: environmental monitoring, water, and bioburden testing. Our principal commercial strategy since launch has been to focus on converting customers among the top fifty global pharmaceutical companies. Our land-and-expand approach concentrates on placing initial systems at leading pharmaceutical manufacturers, validating our products, driving high customer satisfaction, and then expanding throughout our customer's network of sites with more systems and applications. We have simultaneously and opportunistically pursued other important customer types outside of top fifty global pharmaceutical companies, such as CDMOs, CMOs, CROs, vaccine manufacturers, pharmacy compounders (503Bs), among others.

With this approach, we have substantially grown our customer base to over 30 global customers and have placed over 100 systems and sold over 1 million consumables globally. We have customers across approximately 70 sites in 14 countries and the majority of our customers have multiple Growth Direct systems per site and across different facility locations. Our customer base includes manufacturers of biologics, including cell and gene therapies, sterile injectables, small molecule pharmaceutical manufacturers, and CDMOs, among others. We have sold to over half of the top twenty global pharmaceutical companies as measured by revenue. Moreover, we serve customers who operate some of the most complex manufacturing modalities in the world; for example, we support 30% of globally approved cell and gene therapies. Our customers generally purchase our Growth Direct system at one time and we expect them to use these systems for many years before needing to purchase new systems. As a result, a significant portion of our annual sales currently comes from the purchase of our Growth Direct system by a small number of different customers each year. We are working to expand our new customer base and sales within existing customers' organizations to provide a steady stream of sales of our systems and to grow our recurring sales stream from consumables and service contracts.

We have a global commercial team that includes direct sales, commercial operations, validation, field services, strategic marketing, marketing communications and product management. This staff is primarily located in North America and Europe, and we also maintain direct customer support teams providing both validation and field service capabilities in the same territories. We intend to significantly expand our sales, support, and marketing

efforts in the future by expanding our direct footprint in North America and Europe as well as developing a comprehensive distribution and support network in Asia where significant new market opportunities exist.

We increase awareness of our products among our target customers through direct sales calls, trade shows, seminars, academic conferences, web presence, social media and other forms of internet marketing. We supplement these traditional marketing efforts by fostering an active community of users of our products through user groups, customer advisory board meetings, forums and blogs with internally generated and user-generated content.

We employ a high-touch, customer-centric commercial approach focused on maximizing customer success. After a system sale is closed, our team works closely with customers to install systems and provide on-site validation and training support. We focus on supporting our customer's transition to an automated MQC protocol and aim to ensure customer success in routine use. We maintain high customer satisfaction through a robust service and maintenance offering, including an online phone and help desk, remote support and on-site field service.

Manufacturing and supply

Our primary manufacturing facility is located in our headquarters in Lowell, MA. The facility has over 52,000 square feet, with 20,000 square feet of manufacturing floor space that houses multiple manufacturing spaces and functions, including assembly of Growth Direct systems, an ISO-8 cleanroom with ISO-5 laminar flow hoods for consumable manufacturing, dedicated areas for media preparation. The facility has robust quality control from materials receiving to product distribution.

We believe that our manufacturing capacity is sufficient to meet our near-term growth targets for both systems and consumables. Our consumables manufacturing operation, in particular, is designed to meet the demands of high-volume media supply necessary to serve our market. It is centered around a state-of-the-art automated production line that we believe has enough capacity to support near and medium-term growth. To support continuous supply for our customers, we have manufacturing redundancies and maintain inventory in multiple locations, including our Lowell headquarters, a second redundant storage location in the metropolitan Boston area, and at our third-party logistics, or 3PL, warehouses in Schiphol, Netherlands and Frankfurt, Germany.

Our manufacturing strategy includes direct manufacturing of certain products, and third-party outsourcing for certain components and subassemblies. We obtain components and subassemblies for our Growth Direct systems from multiple third-party suppliers and contract manufacturers. While some of these components are sourced from a single supplier, we have qualified second sources for several of our critical parts. We believe that having dual sources for our critical components helps reduce the risk of a production delay caused by a disruption in the supply of a critical component. We perform final assembly, commissioning, and inspection of the systems in our Lowell facility before shipping to customers. Our consumable plate assemblies and lids are manufactured to our specifications by manufacturing partners. We procure media from third-party suppliers and fill and assemble the final consumables in our Lowell facility. We contract with third party vendors to sterilize our consumables before shipping to customers.

We continue to invest in our manufacturing capabilities to increase capacity ahead of future growth, to ensure continuity of supply, and to make order fulfillment consistent and convenient for our customers. Our future manufacturing plans may include expansion of our existing facilities, additional global sites, additional automation lines, and further manufacturing redundancy plans. We are continually evaluating our supply chain and may proactively optimize certain aspects of our manufacturing and supply chain footprint to meet our business objectives.

License agreement

License agreement with Thermo Fisher

In May 2013, we entered into a patent license agreement, or the Thermo Fisher license agreement, with Thermo CRS, Ltd., or Thermo Fisher, pursuant to which we obtained a non-exclusive, worldwide, royalty-bearing, non-sublicensable license under Thermo Fisher's patent rights relating to robotic devices. Pursuant to the Thermo

Fisher license agreement, we paid Thermo Fisher one-time fees in the aggregate of $125,000 and are also obligated to pay royalties at a fixed dollar amount ranging from the low to mid four figures for our sale of each system containing the licensed products, subject to increase or decrease upon certain events. The Thermo Fisher license agreement will remain in effect until the last to expire of the licensed patent rights.

Intellectual property

Our success depends in part on our ability to obtain and maintain intellectual property protection for our products and technology, including by seeking and maintaining patent protection, protecting our trade secrets and other proprietary information, obtaining and maintaining our licenses to use intellectual property owned by third parties, and continually evaluating third-party technologies for further licensing opportunities. We also seek trademark protection where appropriate to protect the names that identify us as the source of our products and services.

We own certain patents, patent applications and intellectual property and license certain patents and other intellectual property from third parties. We have also entered into certain supply and commercial agreements with various vendors and suppliers under which we receive rights to their intellectual property for use in our products. Our material licenses with Thermo Fisher is described in more detail above.

As of May 31, 2021, we own eight issued patents in the United States, 23 issued patents in foreign jurisdictions, including Canada, China, countries in Europe, Hong Kong, India, Japan and Mexico, six pending patent applications in the United States, one pending international application and 35 pending patent applications in foreign jurisdictions, including Australia, Brazil, Canada, China, the European Patent Office, Hong Kong, India, Japan, Malaysia, Mexico, the Philippines, Singapore, South Korea and Thailand. Our issued patents and pending patent applications cover our technologies and products, including machines, manufactures, compositions of matter, and methods of use with respect thereto, related to the Growth Direct platform. Additionally, as of May 31, 2021, we license three issued patents in the United States, Canada and Europe from Thermo Fisher relating to a robotic carousel workstation. The issued or granted patents that we own or that we in-license from Thermo Fisher and any patents that may issue from pending applications that we own have expiration dates or, in the case of patent applications, projected statutory expiration dates, between 2022 and 2039, excluding, with respect to patents that may be issued from our patent applications, any additional term for patent term adjustments or patent term extensions, if applicable.

With respect to our technology related to rapid detection of replicating cells, as of May 31, 2021, we own three issued patents in the United States, six issued patents in foreign jurisdictions including Canada, China, countries in Europe (validated in Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Monaco, Netherlands, Slovakia, Spain, Sweden, Switzerland/Liechtenstein, Turkey and the United Kingdom) and Japan and one pending patent application in the United States, and two pending patent applications in foreign jurisdictions including the European Patent Office and Hong Kong. As set forth in more detail in the following table, our issued patents are expected to expire between 2022 and 2024 and any patent that may be issued from our pending patent application is expected to expire in 2022, without accounting for any patent term adjustments or extensions.

Patents and Patent Applications Related to Our Technology of Rapidly Detecting Replicating Cells	Expected Expiration Date(s) Without Accounting for Any Patent Term Adjustments or Extensions for Pending Applications
Three issued patents in the United States	September 2022; November 2023; May 2024
Three issued patents in Europe (Austria (3), Belgium (3), Czech Republic (3), Denmark (3), Finland (1), France (3), Germany (3), Ireland (3), Italy (3), Luxembourg (2), Monaco (2), Netherlands (3), Slovakia (1), Spain (3), Sweden (3), Switzerland/	September 2022

Patents and Patent Applications Related to Our Technology of Rapidly Detecting Replicating Cells	Expected Expiration Date(s) Without Accounting for Any Patent Term Adjustments or Extensions for Pending Applications
Liechtenstein (3), Turkey (1), and the United Kingdom (3))	
One issued patent in Canada	September 2022
One issued patent in China	September 2022
One issued patent in Japan	September 2022
One pending patent application in the United States	If issued, September 2022
One pending patent application in Europe	If issued, September 2022
One pending patent application in Hong Kong	If issued, September 2022

With respect to our cassette for sterility testing, as of May 31, 2021, we own two issued patents in the United States, eight issued patents in foreign jurisdictions including China, countries in Europe (validated in Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Netherlands, Norway, Poland, Romania, Slovakia, Spain, Sweden, Switzerland/Liechtenstein, Turkey, and the United Kingdom), Hong Kong, Japan and Mexico, one pending patent application in the United States and four pending patent applications in foreign jurisdictions including Canada, India, Japan and Mexico. As set forth in more detail in the following table, our issued patents are expected to expire between 2032 and 2033 and any patents that may be issued from our pending patent applications are expected to expire in 2032, without accounting for any patent term adjustments or extensions.

Patents and Patent Applications Related to Our Cassette for Sterility Testing	Expected Expiration Date(s) Without Accounting for Any Patent Term Adjustments or Extensions for Pending Applications
Two issued patents in the United States	November 2032; November 2033
Two issued patents in Europe (Austria (2), Belgium (2), Czech Republic (1), Denmark (2), Finland (1), France (2), Germany (2), Hungary (2), Iceland (1), Ireland (2), Italy (2), Netherlands (2), Norway (1), Poland (2), Romania (2), Slovakia (1), Spain (2), Sweden (2), Switzerland/Liechtenstein (2), Turkey (10), and the United Kingdom (2))	November 2032
One issued patent in China	November 2032
Two issued patents in Hong Kong	November 2032
Two issued patents in Japan	November 2032
One issued patent in Mexico	November 2032
One pending patent application in the United States	If issued, November 2032
One pending patent application in each of Canada, India, Japan and Mexico	If issued, November 2032

With respect to our cell culturing device, as of March 31, 2021, we own one issued patent in the United States, five issued patents in foreign jurisdictions including China, Hong Kong, India, Japan and Mexico, one pending patent application in the United States and four pending patent applications in foreign jurisdictions including Canada, the European Patent Office, India and Mexico. As set forth in more detail in the following table, the United States issued patent is expected to expire in 2034, the foreign issued patents are expected to expire in 2033 and any patents that may be issued from our pending patent applications are expected to expire in 2033, without accounting for any patent term adjustments or extensions.

Patents and Patent Applications Related to Our Cell Culturing Device	Expected Expiration Date(s) Without Accounting for Any Patent Term Adjustments or Extensions for Pending Applications
One issued patent in the United States	July 2034
One issued patent in China	April 2033
One issued patent in Hong Kong	April 2033
One issued patent in India	April 2033
One issued patent in Japan	April 2033
One issued patent in Mexico	April 2033
One pending patent application in the United States	If issued, April 2033
One pending patent application in Europe	If issued, April 2033
One pending patent application in each of Canada, India and Mexico	If issued, April 2033

With respect to our microbiological growth media and methods of use thereof, as of May 31, 2021, we own one issued patent in the United States, one pending patent application in the United States and 12 pending patent applications in foreign jurisdictions including Australia, Brazil, Canada, China, the European Patent Office, Hong Kong, India, Japan, South Korea, Mexico and Singapore. As set forth in more detail in the following table, the issued patent is expected to expire in 2036 and any patents that may be issued from our pending patent applications are expected to expire in 2035, without accounting for any patent term adjustments or extensions.

Patent and Patent Applications Related to Our Microbiological Growth Media and Methods of Use Thereof	Expected Expiration Date(s) Without Accounting for Any Patent Term Adjustments or Extensions for Pending Applications
One issued patent in the United States	September 2036
One pending patent application in the United States	If issued, April 2035
One pending patent application in Europe	If issued, April 2035
Two pending patent applications in Mexico	If issued, April 2035
One pending patent application in each of Australia, Brazil, Canada, China, Hong Kong, India, Japan, Singapore and South Korea	If issued, April 2035

With respect to our technology relating to the use of clean and dry gas for particle removal and assembly therefor, as of May 31, 2021, we own one pending patent application in the United States and 13 pending patent applications in foreign jurisdictions including Australia, Brazil, Canada, China, the European Patent Office, India, Japan, Malaysia, Mexico, the Philippines, Singapore, South Korea and Thailand. As set forth in more detail in the following table, any patents that may be issued from our pending patent applications are expected to expire in 2039, without accounting for any patent term adjustments or extensions.

Patent Applications Regarding the Use of Clean and Dry Gas for Particle Removal and Assembly Therefor	Expected Expiration Date(s) Without Accounting for Any Patent Term Adjustments or Extensions
One pending patent application in the United States	If issued, August 2039
One pending patent application in Europe	If issued, August 2039
One pending patent application in each of Australia, Brazil, Canada, China, India, Japan, Malaysia, Mexico, the Philippines, Singapore, South Korea and Thailand	If issued, August 2039

With respect to our attenuated-background microbiological nutrient media and method of use thereof, as of May 31, 2021, we own one pending international patent application which, if issued in the United States or foreign jurisdiction, is expected to expire in 2041, without accounting for any patent term adjustments or extensions. Further, with respect to our technology related to filtration assemblies, cassettes, systems and methods for filtration and cell growth, as of May 31, 2021, we own one pending patent application in the United States which, if issued, is expected to expire in 2041, without accounting for any patent term adjustments or extensions.

Further, with respect to the three issued patents non-exclusively licensed from Thermo Fisher, one United States patent is expected to expire in April 2024, one Canadian patent is expected to expire in December 2023 and one European patent (to the extent validated in member countries) is expected to expire in December 2023.

The term of our patents depends upon the laws of the countries in which they are obtained and commonly ends 20 years from the earliest date of filing of a non-provisional patent application. A provisional patent application is not eligible to become an issued patent until, among other things, we file a non-provisional patent application within 12 months of the filing date of the provisional patent application. If we do not timely file non-provisional patent applications, we may lose our priority date with respect to our provisional patent applications and any patent protection on the inventions disclosed in our provisional patent applications. In the United States, patent term adjustments may be available depending upon the time the United States Patent and Trademark Office takes to examine and eventually issue a patent. The protection of patents may vary on a country-by-country and claim-by-claim basis, which can vary the scope of protection afforded by such patents. In addition, we must generally pay fees to maintain our patents annually or at other specified intervals or risk the patent lapsing. We cannot provide any assurance that any of our current or future owned or licensed patent applications will result in the issuance of patents, or that any of our current or future owned or licensed issued patents will effectively protect any of our products or technology or prevent others from commercializing competitive products or technology.

Competition

As a life sciences technology company, we face competition from a wide array of companies in the pharmaceutical manufacturing industry. This competition includes both small companies and large companies with greater financial and technical resources and longer operating histories than our own.

Our competitors may have significantly greater financial resources, established presence in the market, and expertise in research and development, manufacturing, and sales and marketing than we do. These competitors also compete with us in recruiting and retaining qualified engineering, sales, marketing and management personnel, as well as in acquiring technologies complementary to, or necessary for, our programs. Smaller or early-stage companies may also prove to be significant competitors, particularly if they establish collaborative arrangements with large companies.

The key competitive factors affecting the success of the products that we develop are likely to be the continued growth of our market position, our ability to expand our integration with existing customers, our ability to develop new products and improve our existing products, and our ability to grow our sale and marketing capabilities. Our commercial opportunity for any of our products could be reduced or eliminated if our competitors develop and commercialize products that are more effective, are more convenient, or are less expensive than our products, or if they are able to more effectively integrate their systems with customers before we do.

We primarily compete with established manufacturers of traditional MQC testing products, such as petri dishes, incubators, and other manual testing equipment, which our products aim to displace. These companies include bioMerieux, Becton Dickinson, Charles River Labs, Merck Millipore and Thermo Fisher. We also compete with a limited number of companies that have or are attempting to enter the MQC testing market with alternative automated solutions, such as Interscience, which has developed a partially-automated system for MQC testing. There are also several established companies in the bioprocessing technology market with whom we do not currently compete, but that could develop products that will compete with us in the future. Many of the established

companies have substantially greater financial and other resources than us, including larger research and development teams or more established marketing and sales and commercial teams.

Government regulation

We provide products and services used for quality-control testing in pharmaceutical product and medical device manufacturing. Although our Growth Direct platform is not directly subject to regulation by the U.S. Food and Drug Administration, or FDA, our customers' products and product candidates are subject to extensive regulation by the FDA and other federal and state authorities in the United States, as well as comparable authorities in foreign jurisdictions. In the United States, many of our customers' products are regulated as either medical devices or drugs under the Federal Food, Drug, and Cosmetic Act, or FDCA, and its implementing regulations, or as biological products under the FDCA and the Public Health Service Act, or PHSA, and their implementing regulations, each as amended and enforced by the FDA. The FDA regulates the development, design, non-clinical and clinical research, manufacturing, safety, efficacy, labeling, packaging, storage, installation, servicing, recordkeeping, premarket clearance or approval, adverse event reporting, advertising, promotion, marketing and distribution, and import and export of medical devices, drugs and biological products to ensure that such products distributed domestically are safe and effective for their intended uses and otherwise meet the applicable requirements of the FDCA and PHSA. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval, may subject an applicant or manufacturer to administrative or judicial civil or criminal sanctions and adverse publicity.

The manufacture of our Growth Direct system and our consumables is subject to compliance with regulatory systems, standards, guidance and other requirements, as appropriate, including, but not limited to, laws and regulations for safe working conditions and certifications from the International Organization for Standardization. Our products are also subject to various federal, state, local, and foreign laws, regulations and recommendations, relating to the safe and proper use, transportation and disposal of hazardous or potentially hazardous substances. In addition, U.S. and international import and export laws and regulations, including those enforced by the U.S. Departments of Commerce, State and Treasury and OFAC, require us to abide by certain standards relating to the cross-border transit of finished goods, raw materials and supplies and the handling of related information. Our logistics activities must comply with the rules and regulations of the Department of Transportation, the Department of Homeland Security, Department of Commerce, Department of Defense, and the Federal Aviation Administration and similar foreign agencies. We are also subject to various other laws and regulations concerning the conduct of our foreign operations, including the Foreign Corrupt Practices Act and other anti-bribery laws as well as laws pertaining to the accuracy of our internal books and records. We also contract and may in the future contract with the U.S. government. As such, we are subject to certain laws and regulations applicable to companies doing business with the government, as well as with those concerning government contracts, including being subject to potential investigation for compliance with government contract regulations.

Employees and human capital resources

As of May 31, 2021, we had 160 employees of which 157 were full-time employees.

We believe that developing a diverse, equitable and inclusive culture is critical to continuing to attract and retain the top talent necessary for our long-term success and strategy. We value diversity at all levels and continue to focus on extending our diversity and inclusion initiatives across our entire workforce, including the expansion of individuals with diverse backgrounds in leadership.

Our principles of accountability, honesty, integrity and customer-focused, serve as our cultural pillars. We focus our efforts on creating a collaborative environment where our colleagues feel respected and valued. We provide our employees with competitive compensation, opportunities for equity ownership and a robust employment package, including health care, disability and long-term planning insurance, retirement planning and paid time off. In addition, we regularly interact with our employees to gauge employee satisfaction and identify areas of focus.

Facilities

Our principal office is located in Lowell, Massachusetts, where we lease 52,802 square feet of office, laboratory, manufacturing and inventory-storage space. We lease this space under a lease agreement, as amended, that terminates on July 31, 2026. In June 2021, we entered into a Sublease agreement for 33,339 square feet of office and manufacturing space in Lexington, Massachusetts, which expires in June 2029. Further, we maintain inventory at storage warehouses in Schiphol, Netherlands and in Frankfurt, Germany. We believe that our facilities are sufficient to meet our current needs.

Legal proceedings

We are not subject to any material legal proceedings.

Management

Executive officers and directors

The following table sets forth the name, age and position of each of our executive officers and directors as of the date of this prospectus.

Name	Age	Position
Executive Officers		
Robert Spignesi	52	President and Chief Executive Officer and Director
Sean Wirtjes	51	Chief Financial Officer
John Wilson	54	Chief Operating Officer
Victoria Vezina	54	Chief Human Resources Officer
Jonathan Paris	46	General Counsel
Directors		
Jeffrey Schwartz	42	Director, Chairperson
Bruce Cohen	68	Director
David Hirsch, M.D., Ph.D.	50	Director
Melinda Litherland	63	Director
Richard Kollender	51	Director
Natale Ricciardi	72	Director
Alexander Schmitz	46	Director

(1) Member of the audit committee.

(2) Member of the compensation committee.

(3) Member of the nominating and corporate governance committee.

Executive officers

Robert Spignesi has served as the President and Chief Executive Officer of our company since October 2014 and as a member of our board of directors since October 2014. Previously, Mr. Spignesi served as the Vice President & General Manager, Americas of the Microbiology Division at Thermo Fisher Scientific and the Vice President of Global Strategy, Business Development and Marketing at Fisher Scientific. Earlier in his career, he was an Aviation Officer with the U.S. Army. Mr. Spignesi holds an M.B.A. from Columbia University and a B.S. in Economics from the United States Military Academy at West Point. We believe that Mr. Spignesi's role as Chief Executive Officer of our company and broad industry experience qualify him to serve on our board of directors.

Sean Wirtjes has served as the Chief Financial Officer of our company since September 2018. From August 2012 to July 2016, Mr. Wirtjes served as the Vice President, Finance and Controller of the Asia Pacific, Middle East and Africa region for Boston Scientific Corporation, a manufacturer of medical devices, where he led all aspects of financial management for the region. Mr. Wirtjes holds a B.S. in Accounting from the Carroll School of Management at Boston College.

John Wilson has served as the Chief Operating Officer of our company since January 2021. From November 2010 to January 2021, Mr. Wilson served in various roles at BD, a medical technology company, including Vice President of Global Operations, Director of Operational Excellence, Vice President of Manufacturing and Plant Manager, where he led manufacturing activities worldwide to ensure the quality, supply, and delivery of product for BD. Mr. Wilson holds an M.B.A. from the University of San Francisco and a B.S. in Business Management from the University of Phoenix.

Victoria Vezina has served as the Chief Human Resources Officer of our company since September 2020. From May 2019 to June 2020, Ms. Vezina served as the Chief People Officer at SimpliSafe, a home security company based in Boston. Ms. Vezina also served as Head of Global Services HR at The Boston Consulting Group, a

management consulting firm, from May 2016 to March 2019. Ms. Vezina holds an M.A. in Organizational Psychology from William James College and a B.A. in Government from Clark University.

Jonathan Paris has served as the General Counsel of our company since May 2021. From September 2015 to May 2021, Mr. Paris served as the Deputy General Counsel at Insulet Corporation, a medical device company. Prior to that, Mr. Paris also served as an Associate General Counsel at Covidien plc from July 2009 to February 2015 and at Medtronic plc from February 2015 to September 2015. Mr. Paris holds a J.D. from Suffolk University Law School, an M.S.F. from Suffolk University Sawyer Business School and a B.A. in Economics and Government from Colby College.

Non-employee directors

Jeffrey Schwartz has served as a member of our board of directors and Chairperson since April 2018. Mr. Schwartz currently serves as a managing director of Bain Capital Life Sciences, LP, where he is a founding member. Prior to founding Bain Capital Life Sciences, LP in 2016, he was a leader within the healthcare vertical of Bain Capital Private Equity, LP. Mr. Schwartz has also served on the boards of directors of BCLS Acquisition Corp since August 2020, SpringWorks Therapeutics, Inc. since August 2017 and Hugel, Inc. since July 2017. Mr. Schwartz holds an M.B.A. from The Wharton School at the University of Pennsylvania and holds a B.A. in economics from Yale University. We believe that Mr. Schwartz's extensive industry and transactional experience qualify him to serve on our board of directors.

Bruce Cohen has served as a member of our board of directors since April 2018. Mr. Cohen has served as Chief Executive Officer of Statim Pharmaceuticals, Inc., a drug delivery technology company, since November 2018 and as Venture Partner of Xeraya Capital, a private equity and venture capital firm, since January 2016. Mr. Cohen previously served as Chief Executive Officer of PrIME Biologics Pte Ltd, a Singapore-based biotechnology company, from April 2017 to March 2019. Mr. Cohen served on the board of directors of Viropro Inc. from June 2014 to July 2018. Mr. Cohen holds an M.B.A. from Harvard Business School, an M.A. in Sociology from Tufts University and a B.A. in Sociology from Tufts University. We believe that Mr. Cohen's extensive experience with biopharmaceutical and biotechnology companies qualifies him to serve on our board of directors.

David Hirsch, M.D., Ph.D. has served as a member of our board of directors since June 2013. Dr. Hirsch has served as a Managing Director of Longitude Capital Management Co., LLC, a venture capital firm Dr. Hirsch co-founded, since July 2006, where he focuses on investments in biotechnology. Dr. Hirsch has served on the board of directors of Poseida Therapeutics, Inc. since March 2018, Molecular Templates, Inc. since August 2017, and Tricida, Inc. since June 2013. Dr. Hirsch previously served on the board of directors of Collegium Pharmaceutical from January 2012 to July 2020. Dr. Hirsch holds a Ph.D. in Biology from the Massachusetts Institute of Technology, an M.D. from Harvard Medical School and a B.A. in Biology from Johns Hopkins University. We believe that Dr. Hirsch's extensive experience serving on the boards of public companies, his investment experience and his scientific expertise and education qualify him to serve on our board of directors.

Melinda Litherland has served as a member of our board of directors since June 2021. Ms. Litherland currently serves on the board of directors of Bio-Rad Laboratories, Inc., where she has served since April 2017. Ms. Litherland retired in 2015 as a Partner at Deloitte & Touche LLP. During her 34 years at Deloitte & Touche LLP, she worked primarily with technology and life science companies in both audit and consulting capacities. Ms. Litherland holds a B.A. in Economics from Rice University and a MAcc from the Rice University Jones Graduate School of Business. Ms. Litherland is a certified public accountant and a member of the American Institute of CPAs (AICPA). We believe that Ms. Litherland's extensive financial and life sciences background qualify her to serve on our board of directors.

Richard Kollender has served as a member of our board of directors since July 2009, except for the period from February 2017 to October 2018. From August 2016 to September 2018, Mr. Kollender served as our Chief Business Officer and Chief Financial Officer. Mr. Kollender served on the board of directors of Strongbridge Biopharma plc, a biopharmaceutical company, from March 2015 to September 2019, where he also served as Chief Operating Officer from September 2019 to March 2021 and currently serves as President and Chief Financial Officer.

Since January 2011, he has served as a Partner and Executive Manager of Quaker Partners Management, LP, a healthcare investment firm, which he initially joined in 2003. Mr. Kollender previously served as a director of Celator Pharmaceuticals, Inc., currently a subsidiary of Jazz Pharmaceuticals plc, Nupathe, Inc., and Insmed, Inc. Mr. Kollender holds a B.A. in accounting from Franklin and Marshall College and an M.B.A. and a certificate degree in the Graduate Program in Health Administration and Policy, both from the University of Chicago. We believe that Mr. Kollender's knowledge of our company and experience in the industry qualify him to serve on our board of directors.

Natale Ricciardi has served as a member of our board of directors since March 2016. Mr. Ricciardi spent his entire 39-year career at Pfizer Inc., a biopharmaceutical company, retiring in 2011 as a member of the Pfizer Executive Leadership Team. While holding the positions of President, Pfizer Global Manufacturing, and Senior Vice President of Pfizer Inc. from 2004 until 2011, Mr. Ricciardi was directly responsible for all of Pfizer's internal and external supply organization. Mr. Ricciardi maintained responsibility for global manufacturing activities from 2004 through 2011. Previously, from 1999 to 2004, he had oversight for Pfizer's U.S. manufacturing operations and from 1995 to 1999 was Vice President of Manufacturing for Pfizer's Animal Health Group. Mr. Ricciardi has served on the board of directors of Dynavax Technologies Corporation since June 2013 and Prestige Consumer Healthcare, Inc. since May 2016. Mr. Ricciardi holds an M.B.A. in Finance and International Business from Fordham University and a Bachelor of Engineering in Chemical Engineering from The City College of New York. We believe that Mr. Ricciardi's extensive experience at Pfizer and his experience serving on boards of various life sciences companies qualify him to serve on our board of directors.

Alexander Schmitz has served as a member of our board of directors since May 2020. Mr. Schmitz currently serves as a Partner at Endeavour Vision Ltd., a private equity firm, where he has worked since 2015, investing in growth-stage medical device and digital health companies. Mr. Schmitz holds an M.B.A. from INSEAD and a B.S.F.S. in International Economics from Georgetown University. We believe that Mr. Schmitz's industry knowledge and investment experience qualify him to serve on our board of directors.

Board composition and election of directors

Director independence

Our board of directors currently consists of seven members. In connection with this offering, our board of directors has undertaken a review of the independence of each director and considered whether each director has a material relationship with us that could compromise his or her ability to exercise independent judgment in carrying out his or her responsibilities. As a result of this review, our board of directors has determined that, of our seven directors, , , , , and do not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director and that each of these directors is "independent" as that term is defined under the rules of The Nasdaq Stock Market LLC, or Nasdaq. There are no family relationships among any of our directors or executive officers.

Classified board of directors

In accordance with our restated certificate of incorporation that will go into effect upon the closing of this offering, our board of directors will be divided into three classes with staggered, three-year terms. At each annual meeting of stockholders, the successors to directors whose terms then expire will be elected to serve from the time of election and qualification until the third annual meeting following election. Effective upon the closing of this offering, our directors will be divided among the three classes as follows:

- the Class I directors will be , , and , and their terms will expire at our first annual meeting of stockholders following this offering;
- the Class II directors will be , and , and their terms will expire at our second annual meeting of stockholders following this offering; and

- the Class III directors will be , and , and their terms will expire at the third annual meeting of stockholders following this offering.

Our restated certificate of incorporation that will go into effect upon the closing of this offering will provide that the authorized number of directors may be changed only by resolution of the board of directors. Any additional directorships resulting from an increase in the number of directors will be distributed among the three classes so that, as nearly as possible, each class will consist of one-third of the directors. The division of our board of directors into three classes with staggered three-year terms may delay or prevent a change of our management or a change in control of our company. Our directors may be removed only for cause by the affirmative vote of the holders of at least two-thirds of our outstanding voting stock entitled to vote in the election of directors.

Our directors were elected to and currently serve on the board pursuant to a voting agreement among us and several of our largest stockholders. See “Certain Relationships and Related Party Transactions—Voting Agreement.” This agreement will terminate upon the closing of this offering, after which there will be no further contractual obligations regarding the election of our directors.

Board leadership structure

Our board of directors is currently chaired by . In connection with this offering, we will implement corporate governance guidelines. These guidelines provide that, if the chairperson of the board is a member of management or does not otherwise qualify as independent, the independent directors of the board may elect a lead director. The lead director’s responsibilities include, but are not limited to: presiding over all meetings of the board of directors at which the chairperson is not present, including any executive sessions of the independent directors; approving board meeting schedules and agendas; and acting as the liaison between the independent directors and the chief executive officer and chairperson of the board. Our corporate governance guidelines further provide the flexibility for our board of directors to modify our leadership structure in the future as it deems appropriate.

Role of the board in risk oversight

One of the key functions of our board of directors is informed oversight of our risk management process. Our board of directors does not have a standing risk management committee, but rather administers this oversight function directly through our board of directors as a whole, as well as through various standing committees of our board of directors that address risks inherent in their respective areas of oversight. In particular, our board of directors is responsible for monitoring and assessing strategic risk exposure and our audit committee has the responsibility to consider and discuss our major financial risk exposures and the steps our management has taken to monitor and control these exposures, including guidelines and policies to govern the process by which risk assessment and management is undertaken. Our audit committee also monitors compliance with legal and regulatory requirements. Our nominating and corporate governance committee monitors the effectiveness of our corporate governance practices, including whether they are successful in preventing illegal or improper liability-creating conduct. Our compensation committee assesses and monitors whether any of our compensation policies and programs has the potential to encourage excessive risk-taking. While each committee is responsible for evaluating certain risks and overseeing the management of such risks, our entire board of directors is regularly informed through committee reports about such risks.

Board committees

Our board of directors has established three standing committees—audit, compensation and nominating and corporate governance—each of which operates under a charter that has been approved by our board of directors. Upon our listing on The Nasdaq Global Market, each committee’s charter will be available under the Corporate Governance section of our website at *www.rapidmicrobio.com*. The reference to our website address does not constitute incorporation by reference of the information contained at, or available through our website, and you should not consider it to be a part of this prospectus.

Audit committee

The audit committee's responsibilities include, among other things:

- appointing, approving the compensation of, and assessing the independence of our registered public accounting firm;
- overseeing the work of our independent registered public accounting firm, including through the receipt and consideration of reports from such firm;
- reviewing and discussing with management and the independent registered public accounting firm our annual and quarterly financial statements and related disclosures as well as critical accounting policies and practices used by us;
- coordinating our board of directors' oversight of our internal control over financial reporting, disclosure controls and procedures and code of business conduct and ethics;
- discussing our risk management policies;
- meeting independently with our internal auditing staff, if any, independent registered public accounting firm and management;
- reviewing and approving or ratifying any related person transactions; and
- preparing the audit committee report required by Securities and Exchange Commission, or SEC, rules.

The members of our audit committee are , and . serves as the chairperson of the committee. All members of our audit committee meet the requirements for financial literacy under the applicable listing rules of Nasdaq, or the Nasdaq rules. Our board of directors has determined that and meet the independence requirements of Rule 10A-3 under the Exchange Act and the applicable Nasdaq rules. Our board of directors has determined that is an "audit committee financial expert" as defined by applicable SEC rules and has the requisite financial sophistication as defined under the applicable Nasdaq rules.

Compensation committee

The compensation committee's responsibilities include, among other things:

- reviewing and approving, or recommending for approval to the board of directors, the compensation of our Chief Executive Officer and our other executive officers;
- overseeing and administering our cash and equity incentive plans;
- reviewing and making recommendations to our board of directors with respect to director compensation;
- reviewing and discussing annually with management our "Compensation Discussion and Analysis," to the extent required; and
- preparing the annual compensation committee report required by SEC rules, to the extent required.

The members of our compensation committee are , and . serves as the chairperson of the compensation committee. Our board of directors has determined that each of , and is independent under the applicable Nasdaq rules, including the Nasdaq rules specific to membership on the compensation committee, and is a "non-employee director" as defined in Rule 16b-3 promulgated under the Exchange Act.

Nominating and corporate governance committee

The nominating and corporate governance committee's responsibilities include, among other things:

- identifying individuals qualified to become board members;

- recommending to our board of directors the persons to be nominated for election as directors and to each board committee;
- developing and recommending to our board of directors corporate governance guidelines, and reviewing and recommending to our board of directors proposed changes to our corporate governance guidelines from time to time; and
- overseeing a periodic evaluation of our board of directors.

The members of our nominating and corporate governance committee are , and . serves as the chairperson of the nominating and corporate governance committee. Our board of directors has determined that , and are independent under the applicable Nasdaq rules and the SEC rules and regulations.

Compensation committee interlocks and insider participation

No member of our compensation committee is or has been our current or former officer or employee. None of our executive officers served as a director or a member of a compensation committee (or other committee serving an equivalent function) of any other entity, one of whose executive officers served as a director or member of our compensation committee during the fiscal year ended December 31, 2020.

Code of ethics and code of conduct

We have adopted a written code of business conduct and ethics that applies to our directors, officers and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. Upon our listing on The Nasdaq Global Market, our code of business conduct and ethics will be available under the Corporate Governance section of our website at *www.rapidmicrobio.com*. In addition, we intend to post on our website all disclosures that are required by law or the Nasdaq rules concerning any amendments to, or waivers from, any provision of the code. The reference to our website address does not constitute incorporation by reference of the information contained at or available through our website, and you should not consider it to be a part of this prospectus.

Executive and director compensation

This section discusses the material components of the executive compensation program for our executive officers who are named in the “2020 Summary Compensation Table” below. In 2020, our “named executive officers” were as follows:

- Robert Spignesi, Chief Executive Officer;
- Sean Wirtjes, Chief Financial Officer; and
- Victoria Vezina, Chief Human Resources Officer.

2020 Summary compensation table

The following table sets forth summary information concerning the compensation of our named executive officers for the year ended December 31, 2020:

Name and Principal Position	Year	Salary ($)	Option Awards ($)(1)	Non-Equity Incentive Plan Compensation ($)(2)	All Other Compensation ($)(3)	Total ($)
Robert Spignesi *Chief Executive Officer*	2020	$445,228	$301,770	$ 311,644	$ 3,563	$1,062,205
Sean Wirtjes *Chief Financial Officer*	2020	$342,531	$ 59,485	$ 180,261	$ 2,924	$ 585,201
Victoria Vezina *Chief Human Resources Officer*(4)	2020	$101,039	$ 92,466	$ 37,696	$ 997	$ 232,198

(1) The amounts represent the full grant-date fair value of option awards granted during 2020 computed in accordance with FASB ASC Topic 718, or Topic 718, rather than the amounts paid to or realized by the named individual. The information regarding the assumptions used to calculate the value of option awards made to executive officers is discussed in Note 13 to our consolidated financial statements included elsewhere in this prospectus. For Mr. Spignesi, amount also includes $4,894 in the incremental fair value attributable to the repricing of certain of his options in 2020.

(2) The amounts represent (i) performance-based annual cash bonuses earned based on corporate and individual performance during 2020 in the amount of $211,644 for Mr. Spignesi, $130,261 for Mr. Wirtjes and $37,696 for Ms. Vezina, and (ii) special performance-based bonuses earned based on the consummation of a financing and the achievement of certain other corporate objectives during 2020 in the amount of $100,000 for Mr. Spignesi and $50,000 for Mr. Wirtjes.

(3) The amounts represent company 401(k) matching contributions.

(4) Ms. Vezina was appointed our Chief Human Resources Officer effective September 8, 2020.

Narrative disclosure to summary compensation table

2020 Salaries

The base salary payable to each named executive officer is intended to provide a fixed component of compensation reflecting the executive’s skill set, experience, role and responsibilities. The 2020 annual base salaries for our named executive officers were $445,547 for Mr. Spignesi, $342,792 for Mr. Wirtjes and $320,000 for Ms. Vezina. The 2020 annual base salaries for Messrs. Spignesi and Wirtjes were increased from their 2019 levels of $431,000 and $331,200, respectively, effective April 1, 2020.

2020 Bonuses

We maintain an annual performance-based cash bonus program in which our named executive officers participated in 2020. Each named executive officer’s target bonus is expressed as a percentage of base salary, which can be achieved by meeting certain performance goals discussed below at target level. The 2020 annual bonuses for

Messrs. Spignesi and Wirtjes and Ms. Vezina were targeted at 50%, 40% and 40% of their base salaries, respectively. Ms. Vezina's 2020 annual bonus was prorated to reflect her partial period of employment.

For the year ended December 31, 2020, our named executive officers were eligible to earn annual cash bonuses based on the achievement of certain corporate goals approved by the board of directors as well as individual performance. The corporate goals under our 2020 bonus program related to the areas of: (i) commercial and revenue; (ii) costs, expenses and productivity; (iii) customers; (iv) products and quality; (v) profitability, cash flow and capitalization; and (vi) employees. Corporate achievement was weighted 75% and individual achievement was weighted 25%.

In 2020, Messrs. Spignesi and Wirtjes also received special performance-based bonuses in the amount of $100,000 for Mr. Spignesi and $50,000 for Mr. Wirtjes, which were earned based on the consummation of an equity financing of the company and the company's performance for the first half of 2020 being generally consistent with the company's 2020 corporate objectives, as determined by the board of directors.

The actual annual cash bonuses awarded to each named executive officer under the 2020 annual bonus program and the special performance-based bonuses are set forth above in the Summary Compensation Table in the column entitled "Non-Equity Incentive Plan Compensation."

Equity compensation

We have granted stock options to our employees, including our named executive officers, in order to attract and retain them, as well as to align their interests with the interests of our stockholders. To provide a long-term incentive, these stock options generally vest over four years subject to continued service to the company.

In July 2020, we granted to Mr. Spignesi an option to purchase 2,691,527 shares of our Class A common stock and Mr. Wirtjes an option to purchase 539,301 shares of our Class A common stock. The options vest in 48 equal monthly installments following the grant date, subject to the executive's continued service to us, provided that Mr. Spignesi's option will vest in full in the event of a Change of Control (as defined in Mr. Spignesi's offer letter) and Mr. Wirtjes' option will vest in full in the event of Mr. Wirtjes' termination without Cause (as defined in the 2010 Plan) or resignation for Good Reason (as defined in the option agreement) in connection with, and effective as of or within 12 months following, a Sale Event (as defined in the 2010 Plan). In October 2020, we granted to Ms. Vezina an option to purchase 826,327 shares of our Class A common stock, which vests as to 25% of the shares subject to the option on September 8, 2021 and as to 1/48th of the shares subject to the option monthly thereafter, subject to Ms. Vezina's continued service to us, provided that the option will vest in full in the event of Ms. Vezina's termination without Cause or resignation for Good Reason in connection with, and effective as of or within 12 months following, a Sale Event. These options were granted under our 2010 Stock Option and Grant Plan, which we refer to as the 2010 Plan, with exercise prices equal to the fair market value of our Class A common stock on the date of grant, as determined by the board of directors.

In July 2020, our board of directors also approved the repricing of certain outstanding options to reduce the per share exercise price from $3.50 to the then-current per share fair market value of our Class A common stock of $0.15, including options covering an aggregate of 63,180 shares held by Mr. Spignesi.

In March 2021, we granted Mr. Spignesi an option to purchase 607,897 shares of our Class A common stock, Mr. Wirtjes an option to purchase 121,804 shares of our Class A common stock, and Ms. Vezina an option to purchase 60,789 shares of our Class A common stock. The options vest in 48 equal installments following March 9, 2021, subject to the executive's continued service to us, provided that Mr. Spignesi's option will vest in full in the event of a Change of Control, and the options granted to Mr. Wirtjes and Ms. Vezina will vest in full in the event of such executive's termination without Cause or resignation for Good Reason in connection with, and effective as of or within 12 months following, a Sale Event.

In connection with this offering, we intend to adopt the 2021 Incentive Award Plan, referred to below as the 2021 Plan, to facilitate the grant of cash and equity incentives to directors, employees (including our named executive officers) and consultants of our company and certain of its affiliates and to enable us to obtain and retain

services of these individuals, which is essential to our long-term success. The 2021 Plan will be effective on the date immediately prior to the date the registration statement relating to this offering becomes effective. For additional information about the 2021 Plan, please see the section titled “Equity Incentive Plans” below.

Other elements of compensation

Retirement plans

We currently maintain a 401(k) retirement savings plan for our employees, including our named executive officers, who satisfy certain eligibility requirements. Our named executive officers are eligible to participate in the 401(k) plan on the same terms as other full-time employees. The Internal Revenue Code of 1986, as amended, or the Code, allows eligible employees to defer a portion of their compensation, within prescribed limits, on a pre-tax basis through elective contributions to the 401(k) plan. Currently, we match contributions made by participants in the 401(k) plan up to a specified percentage of the employee contributions, and these matching contributions are fully vested as of the date on which the contribution is made. We believe that providing a vehicle for tax-deferred retirement savings though our 401(k) plan adds to the overall desirability of our executive compensation package and further incentivizes our employees, including our named executive officers, in accordance with our compensation policies.

Employee benefits

All of our full-time employees, including our named executive officers, are eligible to participate in our health and welfare plans, which for U.S. employees include medical, dental and vision benefits, medical and dependent care flexible spending accounts, short-term and long-term disability insurance, and life insurance, on the same terms.

Outstanding equity awards at 2020 fiscal year-end

The following table summarizes the number of shares of Class A common stock underlying outstanding equity awards for each named executive officer as of December 31, 2020.

	Option Awards				
Name	Vesting Commencement Date	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price ($)	Option Expiration Date
Robert Spignesi	9/26/2014	39,170	0	0.15	10/22/2025
	10/22/2015	17,000	0	0.15	10/22/2025
	8/12/2016	7,010	0	0.15	8/11/2026
	10/12/2017(1)	640,484	234,338	0.20	10/11/2027
	4/12/2018(1)	2,922,504	1,461,252	0.20	5/28/2028
	7/29/2020(1)	280,637	2,411,160	0.15	7/28/2030
	3/9/2021(1)	0	607,897	2.17	3/14/2031
Sean Wirtjes	9/12/2018(2)	0	488,431	0.15	9/11/2028
	7/29/2020(3)	0	483,124	0.20	7/28/2030
	3/9/2021(3)	0	121,804	2.17	3/14/2031
Victoria Vezina	9/8/2020(2)	0	826,327	0.15	10/28/2030
	3/9/2021(3)	0	60,789	2.17	3/14/2031

(1) Options vest in 48 equal monthly installments following the vesting commencement date, subject to the executive’s continued service on each applicable vesting date, provided that the options will vest in full on a Change of Control.

(2) Option vests as to 25% of the underlying shares on the first anniversary of the vesting commencement date and as to 1/48th of the underlying shares on each monthly anniversary thereafter, subject to the executive's continued service on each applicable vesting date, provided that the option will vest in full in the event of the executive's termination without Cause or resignation for Good Reason in connection with, and effective as of or within 12 months following, a Sale Event.

(3) Option vests in 48 equal monthly installments following the vesting commencement date, subject to the executive's continued service on each applicable vesting date, provided that the option will vest in full in the event of the executive's termination without Cause or resignation for Good Reason in connection with, and effective as of or within 12 months following, a Sale Event.

Executive employment arrangements

Mr. Spignesi. We entered into an offer letter with Mr. Spignesi in September 2014 setting forth the terms of his employment as our Chief Executive Officer, including his initial base salary, target bonus, initial stock option grants and benefit plan participation eligibility. Mr. Spignesi's offer letter provides that all of Mr. Spignesi's equity awards will vest in full upon a change of control. In addition, Mr. Spignesi's offer letter provides that in the event Mr. Spignesi is terminated by us without Cause, he resigns for Good Reason, or he resigns within forty-five days following a change of control that results in a material adverse change in the level of his reporting responsibility or a diminution of duties, then subject to his execution of a release of claims in favor of us, he will be entitled to receive: (i) amount equal to 12 months of base salary and a pro-rated bonus for the year of termination, payable in substantially equal installments; (ii) up to 12 months of health benefits continuation; and (iii) six months' accelerated vesting of his outstanding equity awards.

For purposes of Mr. Spignesi's offer letter:

"Cause" means (i) dishonest statements or acts by the executive with respect to us or any of our affiliates, or any of our current or prospective customers, vendors or other third parties with which such entity does business; (ii) gross negligence or willful misconduct by the executive in the performance of his duties required by his offer letter; (iii) indictment for, formal admission to (including a plea of guilty or nolo contendere to), or conviction of a felony or any misdemeanor involving moral turpitude, deceit, dishonesty or fraud; (iv) material breach of the offer letter by the executive, which breach has been communicated to the executive in the form of a written notice from our board, and if such breach is curable, has not been cured by the executive within a reasonable period not to exceed 30 days following receipt of such written notice; or (v) a violation of any provision of any agreement(s) between the executive and us relating to noncompetition, nondisclosure and/or assignment of inventions.

"Good Reason" generally means, subject to certain notice and cure provisions, (i) a material diminution in the executive's base salary except for across-the-board salary reductions based on our financial performance similarly affecting all or substantially all of our senior management employees; (ii) a material diminution of the executive's duties and responsibilities without his consent; (iii) a change of the primary location to which the executive is assigned that results in an increase of at least 50 miles in the driving distance from the executive's primary residence to such primary location; or (iv) a material breach of the offer letter by us.

Mr. Wirtjes. We entered into an offer letter with Mr. Wirtjes in August 2018 setting forth the terms of his employment as our Chief Financial Officer, including his initial base salary, target bonus, initial stock option grant and benefit plan participation eligibility. Mr. Wirtjes's offer letter provides that in the event that Mr. Wirtjes's employment is terminated by us without Cause or he resigns for Good Reason, then subject to his execution of a release of claims in favor of us and continued compliance with any ongoing restrictive covenants or other obligations, he will be entitled to a lump sum amount equal to six months of base salary and up to six months of health benefits continuation.

For purposes of Mr. Wirtjes's offer letter:

"Cause" means (i) dishonest statements or acts by the executive with respect to us or any of our affiliates, or any of our current or prospective customers, vendors or other third parties with which such entity does business; (ii) commission of a felony or any misdemeanor involving moral turpitude, deceit, dishonesty or fraud; (iii) gross negligence, willful misconduct or repeated or material insubordination by the executive with respect to us or any of our affiliates; or (iv) a violation of any provision of any agreement(s) between the executive and us relating to noncompetition, nondisclosure and/or assignment of inventions.

"Good Reason" generally means, subject to certain notice and cure provisions, (i) a material diminution in the executive's base salary except for across-the-board salary reductions based on our financial performance similarly affecting all or substantially all of our senior management employees; (ii) a material diminution of the executive's job responsibilities; or (iii) a relocation of the executive's principal place of employment that would increase the executive's daily commute by at least 50 miles each way.

Ms. Vezina. We entered into an offer letter with Ms. Vezina in August 2020 setting forth the terms of her employment as our Chief Human Resources Officer, including her initial base salary, target bonus, initial stock option grant and benefit plan participation eligibility. Ms. Vezina's offer letter provides that in the event that Ms. Vezina's employment is terminated by us without Cause or, within twelve months following a Sale Event (as defined in the offer letter), she resigns for Good Reason, then subject to her execution of a release of claims in favor of us and continued compliance with any ongoing restrictive covenants or other obligations, she will be entitled to a lump sum amount equal to six months of base salary and up to six months of health benefits continuation.

For purposes of Ms. Vezina's offer letter:

"Cause" means (i) dishonest statements or acts by the executive with respect to us or any of our affiliates, or any of our current or prospective customers, vendors or other third parties with which such entity does business; (ii) commission of a felony or any misdemeanor involving moral turpitude, deceit, dishonesty or fraud; (iii) gross negligence, willful misconduct or repeated or material insubordination by the executive with respect to us or any of our affiliates; or (iv) a violation of any provision of any agreement(s) between the executive and us relating to noncompetition, nondisclosure and/or assignment of inventions.

"Good Reason" generally means, subject to certain notice and cure provisions, (i) a material diminution in the executive's base salary except for across-the-board salary reductions based on our financial performance similarly affecting all or substantially all of our senior management employees; or (ii) a material reduction in the executive's job responsibilities.

Director compensation

We have not historically maintained a formal non-employee director compensation program. However, we have granted stock options to certain of our directors from time to time, and Mr. Ricciardi, as a non-employee director who is not affiliated with one of our investors, receives a director fee of $30,000 annually for his service on our board of directors. Mr. Spignesi receives no additional compensation for his service as director. His compensation as our Chief Executive Officer is set forth in the 2020 Summary Compensation Table above.

As described above under "Narrative to Summary Compensation Table—Equity Compensation", in July 2020, we repriced certain outstanding options to reduce the per share exercise price from $3.50 to the then-current per share fair market value of our Class A common stock of $0.15, including the options covering 6,615 shares held by Christopher Cashman, options covering 17,546 shares held by Mr. Kollender and options covering 4,211 shares held by Mr. Ricciardi.

2020 Director compensation table

Name	Fees Earned or Paid in Cash ($)	Option Awards ($)	Total ($)
Christopher Cashman(1)	—	17,007(2)	17,007
Bruce Cohen	—	—	—
David Hirsch	—	—	—
Richard Kollender	—	1,326(3)	1,326
Natale Ricciardi	30,000	307(3)	30,307

Name	Fees Earned or Paid in Cash ($)	Option Awards ($)	Total ($)
Alexander Schmitz(4)	—	—	—
Jeffrey Schwartz	—	—	—

(1) Mr. Cashman resigned from our board of directors effective April 28, 2020.

(2) In connection with Mr. Cashman's resignation, our board of directors approved the accelerated vesting of all his then-unvested options effective as of the date of his resignation and extended exercisability of his outstanding options until April 28, 2021. Amount represents the incremental fair value attributed to the accelerated vesting and extended exercisability approved by the board of directors ($16,695) and the incremental fair value attributed to the repricing of options held by Mr. Cashman in 2020, in each case, computed in accordance with ASC Topic 718 ($312).

(3) The amounts reflect the incremental fair value attributed to the repricing of options held by the non-employee director in 2020 computed in accordance with Topic 718.

(4) Mr. Schmitz was appointed to our board of directors effective April 28, 2020.

The table below shows the aggregate numbers of option awards (exercisable and unexercisable) held as of December 31, 2020 by each non-employee director. None of our non-employee directors held any stock awards as of December 31, 2020.

Name	Option Awards Outstanding at 2020 Fiscal Year-End
Christopher Cashman	0
Bruce Cohen	0
David Hirsch	0
Richard Kollender	810,437
Natale Ricciardi	300,216
Alexander Schmitz	0
Jeffrey Schwartz	0

Incentive compensation plans

The following summarizes the material terms of the 2021 Plan, the 2021 Employee Stock Purchase Plan, or the 2021 ESPP, which will be the long-term incentive compensation plans in which our directors and named executive officers are eligible to participate following the consummation of this offering, and the 2010 Plan, under which we have previously made periodic grants of equity and equity-based awards to our directors and named executive officers.

2021 Incentive award plan

Effective the day prior to the first public trading date of our Class A common stock, we intend to adopt and ask our stockholders to approve the 2021 Plan, under which we may grant cash and equity-based incentive awards to eligible service providers in order to attract, retain and motivate the persons who make important contributions to our company. The material terms of the 2021 Plan are summarized below.

Eligibility and administration

Our employees, consultants and directors, and employees and consultants of our subsidiaries, will be eligible to receive awards under the 2021 Plan. The 2021 Plan will be administered by our board of directors, which may delegate its duties and responsibilities to one or more committees of our directors and/or officers (referred to collectively as the plan administrator below), subject to the limitations imposed under the 2021 Plan, Section 16 of the Exchange Act, stock exchange rules and other applicable laws. The plan administrator will have the authority to take all actions and make all determinations under the 2021 Plan, to interpret the 2021 Plan and

award agreements and to adopt, amend and repeal rules for the administration of the 2021 Plan as it deems advisable. The plan administrator will also have the authority to grant awards, determine which eligible service providers receive awards and set the terms and conditions of all awards under the 2021 Plan, including any vesting and vesting acceleration provisions, subject to the conditions and limitations in the 2021 Plan.

Shares available for awards

An aggregate of shares of our Class A common stock will initially be available for issuance under the 2021 Plan. The number of shares initially available for issuance will automatically increase on January 1 of each calendar year beginning in 2022 and ending in and including 2031, equal to the lesser of (A) % of the shares of Class A common stock outstanding on the final day of the immediately preceding calendar year and (B) a smaller number of shares determined by our board of directors. No more than shares of Class A common stock may be issued under the 2021 Plan upon the exercise of incentive stock options. Shares issued under the 2021 Plan may be authorized but unissued shares, shares purchased on the open market or treasury shares.

If an award under the 2021 Plan or the 2010 Plan, expires, lapses or is terminated, exchanged for cash, surrendered, repurchased, canceled without having been fully exercised or forfeited, any unused shares subject to the award will, as applicable, become or again be available for new grants under the 2021 Plan. Awards granted under the 2021 Plan in substitution for any options or other stock or stock-based awards granted by an entity before the entity's merger or consolidation with us or our acquisition of the entity's property or stock will not reduce the shares available for grant under the 2021 Plan, but may count against the maximum number of shares that may be issued upon the exercise of incentive stock options, or ISOs.

Awards

The 2021 Plan provides for the grant of ISOs, nonqualified stock options, or NSOs, stock appreciation rights, or SARs, restricted stock, dividend equivalents, restricted stock units, or RSUs, and other stock or cash-based awards. Certain awards under the 2021 Plan may constitute or provide for payment of "nonqualified deferred compensation" under Section 409A of the Code. All awards under the 2021 Plan will be set forth in award agreements, which will detail the terms and conditions of awards, including any applicable vesting and payment terms and post-termination exercise limitations. A brief description of each award type follows:

- Stock Options and SARs. Stock options provide for the purchase of shares of our Class A common stock in the future at an exercise price set on the grant date. ISOs, by contrast to NSOs, may provide tax deferral beyond exercise and favorable capital gains tax treatment to their holders if certain holding period and other requirements of the Code are satisfied. SARs entitle their holder, upon exercise, to receive from us an amount equal to the appreciation of the shares subject to the award between the grant date and the exercise date. The plan administrator will determine the number of shares covered by each option and SAR, the exercise price of each option and SAR and the conditions and limitations applicable to the exercise of each option and SAR. The exercise price of a stock option or SAR will not be less than 100% of the fair market value of the underlying share on the grant date (or 110% in the case of ISOs granted to certain significant stockholders), except with respect to certain substitute awards granted in connection with a corporate transaction. The term of a stock option or SAR may not be longer than ten years (or five years in the case of ISOs granted to certain significant stockholders).
- Restricted Stock and RSUs. Restricted stock is an award of nontransferable shares of our Class A common stock that remain forfeitable unless and until specified conditions are met and which may be subject to a purchase price. RSUs are contractual promises to deliver shares of our Class A common stock in the future, which may also remain forfeitable unless and until specified conditions are met and may be accompanied by the right to receive the equivalent value of dividends paid on shares of our Class A common stock prior to the delivery of the underlying shares. The plan administrator may provide that the delivery of the shares underlying RSUs will be deferred on a mandatory basis or at the election of the participant. The terms and conditions applicable to restricted stock and RSUs will be determined by the plan administrator, subject to the conditions and limitations contained in the 2021 Plan.

- Other Stock or Cash Based Awards. Other stock or cash-based awards are awards of cash, fully vested shares of our Class A common stock and other awards valued wholly or partially by referring to, or otherwise based on, shares of our Class A common stock or other property. Other stock or cash-based awards may be granted to participants and may also be available as a payment form in the settlement of other awards, as standalone payments and as payment in lieu of compensation to which a participant is otherwise entitled. The plan administrator will determine the terms and conditions of other stock or cash-based awards, which may include any purchase price, performance goal, transfer restrictions and vesting conditions.

Performance criteria

The plan administrator may select performance criteria for an award to establish performance goals for a performance period. Performance criteria under the 2021 Plan may include, but are not limited to, the following: net earnings or losses (either before or after one or more of interest, taxes, depreciation, amortization, and non-cash equity-based compensation expense); gross or net sales or revenue or sales or revenue growth; net income (either before or after taxes) or adjusted net income; profits (including but not limited to gross profits, net profits, profit growth, net operation profit or economic profit), profit return ratios or operating margin; budget or operating earnings (either before or after taxes or before or after allocation of corporate overhead and bonus); cash flow (including operating cash flow and free cash flow or cash flow return on capital); return on assets; return on capital or invested capital; cost of capital; return on stockholders' equity; total stockholder return; return on sales; costs, reductions in costs and cost control measures; expenses; working capital; earnings or loss per share; adjusted earnings or loss per share; price per share or dividends per share (or appreciation in or maintenance of such price or dividends); regulatory achievements or compliance; implementation, completion or attainment of objectives relating to research, development, regulatory, commercial, or strategic milestones or developments; market share; economic value or economic value added models; division, group or corporate financial goals; customer satisfaction/growth; customer service; employee satisfaction; recruitment and maintenance of personnel; human resources management; supervision of litigation and other legal matters; strategic partnerships and transactions; financial ratios (including those measuring liquidity, activity, profitability or leverage); debt levels or reductions; sales-related goals; financing and other capital raising transactions; cash on hand; acquisition activity; investment sourcing activity; and marketing initiatives, any of which may be measured in absolute terms or as compared to any incremental increase or decrease. Such performance goals also may be based solely by reference to the company's performance or the performance of a subsidiary, division, business segment or business unit of the company or a subsidiary, or based upon performance relative to performance of other companies or upon comparisons of any of the indicators of performance relative to performance of other companies. When determining performance goals, the plan administrator may provide for exclusion of the impact of an event or occurrence which the plan administrator determines should appropriately be excluded, including, without limitation, non-recurring charges or events, acquisitions or divestitures, changes in the corporate or capital structure, events unrelated to the business or outside of the control of management, foreign exchange considerations, and legal, regulatory, tax or accounting changes.

Certain transactions

In connection with certain corporate transactions and events affecting our Class A common stock, including a change in control, or change in any applicable laws or accounting principles, the plan administrator has broad discretion to take action under the 2021 Plan to prevent the dilution or enlargement of intended benefits, facilitate the transaction or event or give effect to the change in applicable laws or accounting principles. This includes canceling awards for cash or property, accelerating the vesting of awards, providing for the assumption or substitution of awards by a successor entity, adjusting the number and type of shares subject to outstanding awards and/or with respect to which awards may be granted under the 2021 Plan and replacing or terminating awards under the 2021 Plan. In addition, in the event of certain non-reciprocal transactions with our stockholders, the plan administrator will make equitable adjustments to awards outstanding under the 2021 Plan as it deems appropriate to reflect the transaction.

Provisions of the 2021 plan relating to director compensation

The 2021 Plan provides that the plan administrator may establish compensation for non-employee directors from time to time subject to the 2021 Plan's limitations. Prior to commencing this offering, we intend to approve and implement a compensation program for our non-employee directors, which is described above under the heading "Director Compensation." Our board of directors (or its authorized committee) may modify the non-employee director compensation program from time to time in the exercise of its business judgment, taking into account such factors, circumstances and considerations as it shall deem relevant from time to time, provided that the sum of any cash compensation or other compensation and the grant date fair value of any equity awards granted under the 2021 Plan as compensation for services as a non-employee director during any fiscal year may not exceed $ in the fiscal year of the non-employee director's initial service and $ in any other fiscal year. The plan administrator may make exceptions to this limit for individual non-employee directors in extraordinary circumstances, as the plan administrator may determine in its discretion, subject to the limitations in the 2021 Plan.

Plan amendment and termination

Our board of directors may amend or terminate the 2021 Plan at any time; however, no amendment, other than an amendment that increases the number of shares available under the 2021 Plan, may materially and adversely affect an award outstanding under the 2021 Plan without the consent of the affected participant and stockholder approval will be obtained for any amendment to the extent necessary to comply with applicable laws. Further, the plan administrator may, without the approval of our stockholders, amend any outstanding stock option or SAR to reduce its price per share, other than in the context of corporate transactions or equity restructurings, as described above. The 2021 Plan will remain in effect until the tenth anniversary of its effective date, unless earlier terminated by our board of directors. No awards may be granted under the 2021 Plan after its termination.

Foreign participants, claw-back provisions, transferability and participant payments

The plan administrator may modify awards granted to participants who are foreign nationals or employed outside the United States or establish subplans or procedures to address differences in laws, rules, regulations or customs of such foreign jurisdictions. All awards will be subject to any company claw-back policy as set forth in such claw-back policy or the applicable award agreement. Except as the plan administrator may determine or provide in an award agreement, awards under the 2021 Plan are generally non-transferrable, except by will or the laws of descent and distribution, or, subject to the plan administrator's consent, pursuant to a domestic relations order, and are generally exercisable only by the participant. With regard to tax withholding obligations arising in connection with awards under the 2021 Plan and exercise price obligations arising in connection with the exercise of stock options under the 2021 Plan, the plan administrator may, in its discretion, accept cash, wire transfer or check, shares of our Class A common stock that meet specified conditions, a promissory note, a "market sell order," such other consideration as the plan administrator deems suitable or any combination of the foregoing.

2021 Employee stock purchase plan

Effective the day prior to the first public trading date of our Class A common stock, we intend to adopt and ask our stockholders to approve the 2021 ESPP, the material terms of which are summarized below.

Shares available for awards; administration

A total of shares of our Class A common stock will initially be reserved for issuance under the 2021 ESPP. In addition, the number of shares available for issuance under the 2021 ESPP will be annually increased on January 1 of each calendar year beginning in 2022 and ending in and including 2031, by an amount equal to the lesser of (A) % of the shares outstanding on the final day of the immediately preceding calendar year and (B) such smaller number of shares as is determined by our board of directors, provided that no more than shares of our Class A common stock may be issued under the 2021 ESPP. Our board of directors or a

committee of our board of directors will administer and will have authority to interpret the terms of the 2021 ESPP and determine eligibility of participants. We expect that the compensation committee will be the initial administrator of the 2021 ESPP.

Eligibility

All of our employees are eligible to participate in the 2021 ESPP, unless the administrator determines to limit participation in accordance with the terms of the 2021 ESPP and provided that an employee may not be granted rights to purchase stock under our 2021 ESPP if the employee, immediately after the grant, would own (directly or through attribution) stock possessing 5% or more of the total combined voting power or value of all classes of our stock.

Grant of rights

The 2021 ESPP is intended to qualify under Section 423 of the Code and stock will be offered under the 2021 ESPP during offering periods. The length of the offering periods under the 2021 ESPP will be determined by the plan administrator and may be up to twenty-seven months long. Employee payroll deductions will be used to purchase shares on each purchase date during an offering period. The purchase dates for each offering period will be the final trading day in the offering period. Offering periods under the 2021 ESPP will commence when determined by the plan administrator. The plan administrator may, in its discretion, modify the terms of future offering periods.

The 2021 ESPP permits participants to purchase Class A common stock through payroll deductions of up to a specified percentage of their eligible compensation. The plan administrator will establish a maximum number of shares that may be purchased by a participant during any offering period. In addition, no employee will be permitted to accrue the right to purchase stock under the 2021 ESPP at a rate in excess of $25,000 worth of shares during any calendar year during which such a purchase right is outstanding (based on the fair market value per share of our Class A common stock as of the first day of the offering period).

On the first trading day of each offering period, each participant will automatically be granted an option to purchase shares of our Class A common stock. The option will expire at the end of the applicable offering period, and will be exercised at that time to the extent of the payroll deductions accumulated during the offering period. The purchase price of the shares, in the absence of a contrary designation, will be 85% of the lower of the fair market value of our Class A common stock on the first trading day of the offering period or on the purchase date. Participants may voluntarily end their participation in the 2021 ESPP at any time during a specified period prior to the end of the applicable offering period, and will be paid their accrued payroll deductions that have not yet been used to purchase shares of Class A common stock. Participation ends automatically upon a participant's termination of employment.

A participant may not transfer options granted under the 2021 ESPP other than by will or the laws of descent and distribution, and options granted under the 2021 ESPP are generally exercisable only by the participant.

Certain transactions

In the event of certain non-reciprocal transactions or events affecting our Class A common stock, the plan administrator will make equitable adjustments to the 2021 ESPP and outstanding rights. In the event of certain unusual or non-recurring events or transactions, including a change in control, the plan administrator may provide for (1) either the replacement of outstanding rights with other rights or property or termination of outstanding rights in exchange for cash, (2) the assumption or substitution of outstanding rights by the successor or survivor corporation or parent or subsidiary thereof, if any, (3) the adjustment in the number and type of shares of stock subject to outstanding rights, (4) the use of participants' accumulated payroll deductions to purchase stock on a new purchase date prior to the next scheduled purchase date and termination of any rights under ongoing offering periods or (5) the termination of all outstanding rights.

Plan amendment

The plan administrator may amend, suspend or terminate the 2021 ESPP at any time. However, stockholder approval will be obtained for any amendment that increases the aggregate number or changes the type of shares that may be sold pursuant to rights under the 2021 ESPP, changes the corporations or classes of corporations whose employees are eligible to participate in the 2021 ESPP or changes the 2021 ESPP in any manner that would cause the 2021 ESPP to no longer be an employee stock purchase plan within the meaning of Section 423(b) of the Code.

2010 Stock option and grant plan

Our board of directors adopted our 2010 Stock Option and Grant Plan, or the 2010 Plan, and our stockholders approved our 2010 Plan, in June 2010. The 2010 Plan has subsequently been amended and/or restated to increase the shares reserved under the plan, among other changes. Following the effectiveness of the 2021 Plan, we will cease granting additional awards under our 2010 Plan. However, our 2010 Plan will continue to govern the terms and conditions of the outstanding stock option awards previously granted thereunder.

Share Reserve. As of May 31, 2021, stock options covering 20,847,569 shares with a weighted-average exercise price of $0.46 per share and 1,332,255 restricted shares were outstanding under our 2010 Plan, and 2,654,715 shares of our Class A common stock remained available for the future grant of awards under our 2010 Plan.

Administration. Our board of directors or a committee delegated by our board of directors administers our 2010 Plan. Subject to the terms of our 2010 Plan, the administrator has the power to, among other things, determine who will be granted awards, determine the terms and conditions of each awards, accelerate the time(s) when an award may vest or be exercised and construe and interpret the terms of our 2010 Plan and awards granted thereunder.

Options. Options granted under our 2010 Plan are subject to terms and conditions generally similar to those described above with respect to options that may be granted under our 2021 Plan.

Restricted Stock. Restricted stock granted under our 2010 Plan is subject to terms and conditions generally similar to those described above with respect to restricted stock that may be granted under our 2021 Plan.

Changes to Capital Structure. If, as a result of any reorganization, recapitalization, reclassification, stock dividend, stock split, reverse stock split or other similar change in the company's capital stock, the outstanding shares of common stock of the company are increased or decreased or are exchanged for a different number or kind of shares or other securities of the company, or additional shares or new or different shares or other securities of the company or other non-cash assets are distributed with respect to such shares or other securities, or, if, as a result of any merger or consolidation, or sale of all or substantially all of the assets of the company, the outstanding shares of common stock are converted into or exchanged for securities of the company or any successor entity, the plan administrator will adjust the maximum number of shares reserved for issuance under the 2010 Plan, the number and kind of shares or other securities subject to outstanding awards under the 2010 Plan, and the exercise or repurchase price, as applicable of each outstanding award under the 2010 Plan.

Sale Event. In the event of a Sale Event (as defined in the 2010 Plan), the 2010 Plan and outstanding awards will terminate or be forfeited unless such awards assumed or substituted, provided that the company may provide for a cash payment in exchange for the cancellation of such awards. In the event of a termination of options, each holder of options will be permitted to exercise such options during a specified period of time prior to the consummation of the Sale Event.

Certain relationships and related party transactions

The following includes a summary of transactions since January 1, 2018 to which we have been a party in which the amount involved exceeded or will exceed the lesser of (i) $120,000 or (ii) one percent of the average of our total assets at fiscal year-end for our last two fiscal years, and in which any of our directors, executive officers or, to our knowledge, beneficial owners of more than 5% of our capital stock or any member of the immediate family of any of the foregoing persons had or will have a direct or indirect material interest. We also describe below certain other transactions with our directors, executive officers and stockholders.

Preferred stock financings

Series B1 Preferred Stock Financing. In April 2018 and July 2019, we issued and sold to investors in private placements an aggregate of 60,017,425 shares of our Series B1 preferred stock at a purchase price of $1.00 per share, for aggregate consideration of approximately $60.0 million.

Series C1/C2 Preferred Stock Financing. In April 2020, we issued and sold to investors in a private placement an aggregate of (i) 23,611,208 shares of our Series C1 preferred stock at a purchase price of $1.15 per share, (ii) 10,351,063 shares of Series C1 preferred stock in connection with the conversion of convertible promissory notes at a conversion price of $1.087 per share, and (iii) 20,301,829 shares of our Series C2 preferred stock at a purchase price of $1.15 per share, for aggregate consideration of approximately $60.0 million.

Series D1/D2 Preferred Stock Financing. In March 2021, we issued and sold to investors in a private placement an aggregate of 22,086,725 shares of our Series D1 preferred stock and an aggregate of 413,268 shares of our Series D2 preferred stock at a purchase price of $3.60 per share, for aggregate consideration of approximately $81.0 million.

The following table sets forth the aggregate number of shares of our capital stock acquired by beneficial owners of more than 5% of our capital stock in the financing transactions described above. Each share of our Series B1 preferred stock will convert into one share of Class A common stock immediately prior to the closing of this offering. Each share of our Series C1 preferred stock will convert into one share of Class A common stock immediately prior to the closing of this offering. Each share of our Series C2 preferred stock will convert into one share of Class B common stock immediately prior to the closing of this offering. Each share of our Series D1 preferred stock will convert into one share of Class A common stock immediately prior to the closing of this offering. Each share of our Series D2 preferred stock will convert into one share of Class B common stock immediately prior to the closing of this offering.

Participants	Series B1 Preferred Stock	Series C1 Preferred Stock	Series C2 Preferred Stock	Series D1 Preferred Stock	Series D2 Preferred Stock
5% or Greater Stockholders(1)					
Bain Capital Life Sciences Fund, L.P.	31,750,072	6,053,214	—	—	—
ABG WTT-Rapid Limited	—	—	31,739,130	—	—
Ally Bridge MedAlpha Master Fund L.P.	—	—	—	—	2,777,777
Longitude Venture Partners II, L.P.	5,654,529	2,291,665	—	—	—
Colony Harvest Ltd.	12,500,000	2,382,682	—	—	—
Endeavour Medtech Growth II LP	—	8,828,422	—	1,388,888	—

(1) Additional details regarding these stockholders and their equity holdings are provided in this prospectus under the caption "Principal Stockholders."

Some of our directors are associated with our principal stockholders as indicated in the table below:

Director	Principal Stockholder
Bruce Cohen	Colony Harvest Ltd.
Jeffrey Schwartz	Bain Capital Life Sciences Fund, L.P.
David Hirsch	Longitude Venture Partners II, L.P.
Alexander Schmitz	Endeavour Medtech Growth II LP

Exchange agreement

In June 2021, we entered into an exchange agreement with ABG WTT and Ally Bridge MedAlpha, pursuant to which we issued to ABG WTT 11,437,301 shares of our Series C2 preferred stock in exchange for an equal number of shares of Series C1 preferred stock and 2,364,509 shares of Series D2 preferred stock in exchange for an equal number of shares of Series D1 preferred stock.

Investor rights agreement

We entered into a Seventh Amended and Restated Investors' Rights Agreement in March 2021 with the holders of our preferred stock, including entities with which certain of our directors are related. The agreement provides for certain rights relating to the registration of such holders' common stock, including shares issuable upon conversion of preferred stock, and a right of first refusal to purchase future securities sold by us. See "Description of Capital Stock—Registration Rights" for additional information.

Voting agreement

We entered into a Seventh Amended and Restated Voting Agreement by and among us and certain of our stockholders, pursuant to which the following directors were elected to serve as members on our board of directors and, as of the date of this prospectus, continue to so serve: Robert Spignesi, Bruce Cohen, Richard Kollender, Jeffrey Schwartz, Natale Ricciardi, David Hirsch and Alexander Schmitz. Robert Spignesi was selected to serve on our board of directors in his capacity as our chief executive officer. Bruce Cohen, Jeffrey Schwartz, David Hirsch and Alexander Schmitz were initially selected to serve on our board of directors as representatives of holders of our preferred stock, as designated by entities affiliated with Colony Harvest Ltd., Bain Capital Life Sciences Fund, L.P., Longitude Venture Partners II, L.P. and Endeavour Medtech Growth II LP, respectively.

The voting agreement will terminate upon the closing of this offering, and members previously elected to our board of directors pursuant to this agreement will continue to serve as directors until they resign, are removed or their successors are duly elected by the holders of our common stock. The composition of our board of directors after this offering is described in more detail under "Management—Board Composition and Election of Directors."

Indemnification agreements

We intend to enter into indemnification agreements with each of our directors and executive officers. These agreements, among other things, require us or will require us to indemnify each director (and in certain cases their related venture capital funds) and executive officer to the fullest extent permitted by Delaware law, including indemnification of expenses such as attorneys' fees, judgments, fines and settlement amounts incurred by the director or executive officer in any action or proceeding, including any action or proceeding by or in right of us, arising out of the person's services as a director or executive officer.

Policies and procedures for related person transactions

Our board of directors has adopted a written related person transaction policy, to be effective upon the closing of this offering, setting forth the policies and procedures for the review and approval or ratification of related person transactions. This policy will cover, with certain exceptions set forth in Item 404 of Regulation S-K under the Securities Act, any transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships, in which we were or are to be a participant, where the amount involved exceeds the lesser of (i) $120,000 or (ii) one percent of the average of our total assets at fiscal year-end for any fiscal year and a related person had, has or will have a direct or indirect material interest, including without limitation, purchases of goods or services by or from the related person or entities in which the related person has a material interest, indebtedness, guarantees of indebtedness and employment by us of a related person. In reviewing and approving any such transactions, our audit committee is tasked to consider all relevant facts and circumstances, including, but not limited to, whether the transaction is on terms comparable to those that could be obtained in an arm's length transaction and the extent of the related person's interest in the transaction. All of the transactions described in this section occurred prior to the adoption of this policy.

Principal stockholders

The following table sets forth information with respect to the beneficial ownership of our common stock, as of May 31, 2021 by:

- each person or group of affiliated persons known by us to beneficially own more than 5% of our common stock;
- each of our named executive officers;
- each of our directors; and
- all of our executive officers and directors as a group.

The number of shares beneficially owned by each stockholder is determined under rules issued by the Securities and Exchange Commission. Under these rules, beneficial ownership includes any shares as to which the individual or entity has sole or shared voting power or investment power. Applicable percentage ownership is based on 125,832,086 shares of Class A common stock and 34,516,907 shares of Class B common stock outstanding as of May 31, 2021, assuming the conversion of all outstanding shares of preferred stock into common stock. In computing the number of shares beneficially owned by an individual or entity and the percentage ownership of that person, shares of common stock subject to options, warrants or other rights held by such person that are currently exercisable or will become exercisable within 60 days of May 31, 2021 are considered outstanding, although these shares are not considered outstanding for purposes of computing the percentage ownership of any other person. Unless noted otherwise, the address of all listed stockholders is 100 Pawtucket boulevard West, Suite 280, Lowell, Massachusetts 01854. Each of the stockholders listed has sole voting and investment power with respect to the shares beneficially owned by the stockholder unless noted otherwise, subject to community property laws where applicable.

				Shares Beneficially Owned Prior to Offering		Shares Beneficially Owned After Offering	
Name of Beneficial Owner	Number of Shares of Class A Common Stock Owned	Number of Shares of Class B Common Stock Owned	Number of Shares of Class A and Class B Common Stock Owned	Percentage of Class A Common Stock Owned	Percentage of Class A and Class B Common Stock Owned	Percentage of Class A Common Stock Owned	Percentage of Class A and Class B Common Stock Owned After Offering
Major Stockholders Including 5% or Greater Stockholders							
Entities affiliated with Bain Capital Life Sciences Investors, LLC(1)	41,672,820	—	41,672,820	33.12%	25.99%		
Longitude Venture Partners II, L.P.(2)	20,212,774	—	17,039,791	15.67%	12.36%		
Colony Harvest Ltd.(3)	14,882,682	—	14,882,682	11.83%	9.28%		
Entities affiliated with Endeavour Medtech Growth II LP(4)	10,218,180	—	10,218,180	8.12%	6.37%		
Entities affiliated with ABG WTT-Rapid Limited(5)	6,490,000	34,516,907	34,516,907	4.90%	21.53%		
Named Executive Officers and Directors							
Robert Spignesi(6)	5,383,652	—	5,383,652	4.11%	3.25%		
Sean Wirtjes(7)	878,753	—	878,753	*	*		

Name of Beneficial Owner	Number of Shares of Class A Common Stock Owned	Number of Shares of Class B Common Stock Owned	Number of Shares of Class A and Class B Common Stock Owned	Shares Beneficially Owned Prior to Offering: Percentage of Class A Common Stock Owned	Shares Beneficially Owned Prior to Offering: Percentage of Class A and Class B Common Stock Owned	Shares Beneficially Owned After Offering: Percentage of Class A Common Stock Owned	Shares Beneficially Owned After Offering: Percentage of Class A and Class B Common Stock Owned After Offering
Victoria Vezina(8)	5,065	—	5,065	*	*		
Bruce Cohen(3)	14,882,682	—	14,882,682	11.83%	9.28%		
David Hirsch, M.D., Ph.D.(2)	20,212,774	—	20,212,774	15.67%	12.36%		
Richard Kollender(9)	8,240,804	—	8,240,804	6.48%	5.10%		
Melinda Litherland	—	—	—	—	—		
Natale Ricciardi(10)	254,944	—	254,944	*	*		
Alexander Schmitz	—	—	—	—	—		
Jeffrey Schwartz(1)	41,672,820	—	41,672,820	33.12%	25.99%		
All executive officers and directors as a group(11) (12 persons)	91,539,123	—	91,539,123	72.11%	56.69%		

* Represents beneficial ownership of less than 1%

(1) Consists of (i) 37,803,286 shares of Class A common stock issuable upon the conversion of preferred stock held by Bain Capital Life Sciences Fund, L.P., or BCLS, and (ii) 3,869,534 shares of Class A common stock issuable upon the conversion of shares of preferred stock held by BCIP Life Sciences Associates, LP, or BCIPLS, and together with BCLS, the Bain Capital Life Sciences Entities. Bain Capital Life Sciences Investors, LLC, or BCLSI, whose managers are Jeffrey Schwartz, who is the chairman of our Board, and Adam Koppel, is the ultimate general partner of BCLS and governs the investment strategy and decision-making process with respect to investments held by BCIPLS. As a result, BCLSI, Mr. Schwartz and Dr. Koppel may each be deemed to share voting and dispositive power with respect to the securities held by the Bain Capital Life Sciences Entities. The address of the Bain Capital Life Sciences Entities is 200 Clarendon Street, Boston, Massachusetts 02116.

(2) Consists of (i) 319,590 shares of Class A common stock, (ii) 16,720,201 shares of Class A common stock issuable upon the conversion of preferred stock and (iii) 3,172,983 shares of Class A common stock issuable upon the conversion of warrants held by Longitude Venture Partners II, L.P., or LVP II. Longitude Capital Partners II, LLC, or LCP II, is the general partner of LVP II and may be deemed to have voting and investment power over the shares held by LVP II. Patrick G. Enright and Juliet Tammenoms Bakker are managing members of LCP II and may be deemed to share voting and investment power over the shares held by LVP II. David Hirsch, one of our directors, is a member of LCP II and may be deemed to share voting and investment power over the shares of the company held by LVP II. LCP II and each of these individuals disclaim beneficial ownership of such shares except to the extent of their respective pecuniary interest therein. The mailing address for Longitude Venture Partners II, L.P. is 2740 Sand Hill Road, Menlo Park, California 94025.

(3) Consists of 14,882,682 shares of Class A common stock issuable upon the conversion of preferred stock held by Colony Harvest Ltd., or Colony Harvest. Colony Harvest is the Special Purpose Vehicle set up by Xeraya Capital, or Xeraya, for investment into Rapid Micro Biosystems, Inc. Xeraya may be deemed to be the beneficial owners of shares held by Colony Harvest. Fares Zahir is the Director of Xeraya and may be deemed to be the beneficial owner of the shares held by Colony Harvest. Mr. Zahir disclaims beneficial ownership except to the extent of his pecuniary interest therein. Bruce Cohen, a member of our board, is a Venture Partner at Xeraya. Mr. Cohen may be deemed to beneficially own the shares held by Colony Harvest and disclaims beneficial ownership except to the extent of his pecuniary interest therein. Mr. Cohen will resign as a member of our board prior to the offering. The mailing address for Colony Harvest Ltd. is 26.03-26.08, Level 26 GTower, No. 199, Jalan Tun Razak, 50400 Kuala Lumpur, Malaysia.

(4) Consists of (i) 10,037,523 shares of Class A common stock issuable upon the conversion of preferred stock held by Endeavour Medtech Growth II LP, or Growth, and (ii) 180,657 shares of Class A common stock issuable upon conversion of shares of preferred stock held by Endeavour Medtech Growth II Parallel LP, or Parallel. The general partner of Growth and Parallel is Endeavour Medtech II GP Limited, or Endeavour GP. Endeavour GP is controlled by a board of three directors that acts by majority approval and possesses sole voting and dispositive power with respect to the shares held by Growth and Parallel. The individual members of such board are: John Bridle, Nick Barton and Michel Davy. Each of Messrs. Bridle, Barton and Davy disclaim beneficial ownership of the shares held by Growth and Parallel except to the extent of his pecuniary interest therein. The mailing address for each of the entities and individuals above is c/o Endeavour Medtech Growth II LP, P.O. Box 656, East Wing Trafalgar Court, Les Banques, St Peter Port, Guernesy GY1 3PP.

(5) Consists of (i) 31,739,130 shares of Class B common stock issuable upon the conversion of preferred stock held by ABG WTT-Rapid Limited, or ABG-WTT and (ii) 2,777,777 shares of Class B common stock issuable upon the conversion of preferred stock held by Ally Bridge MedAlpha Master Fund L.P., or MedAlpha. ABG-WTT is wholly owned by Ally Bridge Group-WTT Global Life Science Capital Partners, L.P. Voting and investment decisions with respect to any securities owned by ABG-WTT are made by the investment committee of ABG-WTT Global Life Science Capital Partners GP Limited, the general partner of ABG-WTT Global Life Science Capital Partners GP, L.P., which is the general partner of Ally Bridge Group-WTT Global Life Science Capital Partners, L.P. As such, each of the foregoing entities may be deemed to share beneficial ownership of the shares held by ABG-WTT. Each of them disclaims any such beneficial ownership. Mr. Fan Yu is the sole shareholder of ABG Management Ltd., which is the sole member of each of Ally Bridge MedAlpha Management GP, LLC and Ally Bridge Group (NY) LLC. Ally Bridge Group (NY) LLC and Ally Bridge MedAlpha Management L.P., acting through its general partner Ally Bridge MedAlpha Management GP, LLC manage MedAlpha's investments. As such, each of the foregoing entities and Mr. Fan Yu may be deemed to share beneficial ownership of the shares held by MedAlpha. Each of them disclaims any such beneficial ownership. We shall not effect any conversion of our Class B common stock, and a holder of our Class B common stock shall not have the right to convert any portion of such holder's Class B Common Stock, to the extent that, after giving effect to such conversion, such holder would beneficially own in excess of 4.9% of the

total number of shares of our Class A common stock then issued and outstanding, or the Beneficial Ownership Limitation. As a result, the shares of Class A common stock beneficially owned by ABG-WTT and MedAlpha exclude shares issuable upon the conversion of Class B common stock that are not convertible within 60 days of May 31, 2021 by virtue of the Beneficial Ownership Limitation. The mailing address for ABG WTT is c/o Ally Bridge Group, Room 3002-4, 30/F Gloucester Tower, The Landmark, 15 Queen's Road Central, Hong Kong. The mailing address for MedAlpha is c/o Ally Bridge Group (NY) LLC, 430 Park Avenue, 12th Floor, New York, New York 10022.

(6) Includes (i) 251,394 shares of Class A common stock. (ii) 53 shares of Class A common stock issuable upon the conversion of warrants and (iii) 5,132,205 options which are exercisable within 60 days of May 31, 2021.

(7) Includes (i) 684,159 shares of Class A common stock and (ii) 194,594 options which are exercisable within 60 days of May 31, 2021.

(8) Includes 5,065 options which are exercisable within 60 days of May 31, 2021.

(9) Includes (i) 290,558 shares of Class A common stock held by Quaker Bioventures II, L.P., or Quaker, (ii) 6,575,431 shares of Class A common stock issuable upon the conversion of preferred stock held by Quaker, (iii) 564,378 shares of Class A common stock issuable upon the exercise of warrants held by Quaker, and (iv) 810,437 options which are exercisable within 60 days of May 31, 2021. Richard Kollender is an executive manager of Quaker and has shared voting and investment power over the securities held by Quaker. Mr. Kollender may be deemed to be a beneficial owner of the securities held by Quaker. Mr. Kollender disclaims beneficial ownership of the securities held by Quaker except to the extent of his pecuniary interest therein.

(10) Includes 254,944 options which are exercisable within 60 days of May 31, 2021.

(11) Includes (i) 1,545,701 shares of Class A common stock, (ii) 79,851,134 shares of Class A common stock issuable upon conversion of preferred stock, (iii) 3,737,414 shares of Class A common stock issuable upon the conversion of warrants and (iv) 6,404,874 options which are exercisable within 60 days of May 31, 2021

Description of capital stock

General

The following description summarizes some of the terms of our restated certificate of incorporation and amended and restated bylaws that will become effective upon the closing of this offering, the investors' rights agreement and of the General Corporation Law of the State of Delaware. Because it is only a summary, it does not contain all the information that may be important to you. For a complete description, you should refer to our restated certificate of incorporation, amended and restated bylaws and investors' rights agreement, copies of which have been or will be filed as exhibits to the registration statement of which this prospectus is a part, as well as the relevant provisions of the General Corporation Law of the State of Delaware. The description of our common stock and preferred stock reflects changes to our capital structure that will occur immediately prior the closing of this offering.

Following the closing of this offering, our authorized capital stock will consist of shares of Class A common stock, par value $0.01 per share, shares of Class B common stock, par value $0.01 per share and shares of preferred stock, par value $0.01 per share.

As of May 31, 2021, there were 4,827,360 shares of our Class A common stock outstanding, no shares of Class B common stock outstanding, 121,004,726 shares of our Class A common stock issuable upon the automatic conversion of all outstanding Series A1, B1, C1 and D1 preferred stock and 34,516,907 shares of our Class B common stock issuable upon the automatic conversion of all shares of Series C2 and D2 preferred stock, held of record by 78 stockholders.

Class A common stock and Class B common stock

Holders of our Class A common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. An election of directors by our stockholders shall be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. Subject to the supermajority votes for some matters, other matters shall be decided by the affirmative vote of our stockholders having a majority in voting power of the votes cast by the stockholders present or represented and voting on such matter. Our restated certificate of incorporation and amended and restated bylaws also provide that our directors may be removed only for cause and only by the affirmative vote of the holders of at least two-thirds in voting power of the outstanding shares of capital stock entitled to vote thereon. In addition, the affirmative vote of the holders of at least two-thirds in voting power of the outstanding shares of capital stock entitled to vote thereon is required to amend or repeal, or to adopt any provision inconsistent with, several of the provisions of our restated certificate of incorporation. See below under "— Anti-Takeover Effects of Delaware Law and Our Certificate of Incorporation and Bylaws—Amendment of Charter Provisions."

Holders of our Class B common stock have identical rights to holders of our Class A common stock as set forth in the preceding paragraph, other than as follows: (i) except as otherwise expressly provided in our restated certificate of incorporation or as required by applicable law, on any matter that is submitted to a vote by our stockholders, while holders of our Class A common stock are entitled to one vote per share of Class A common stock, holders of our Class B common stock are not entitled to any votes per share of Class B common stock, including for the election of directors, and (ii) while holders of our Class A common stock have no conversion rights, holders of our Class B common stock shall have the right to convert each share of our Class B common stock into one share of Class A common stock at such holder's election, provided that as a result of such conversion, such holder would not beneficially own in excess of 4.9% of any class of our securities registered under the Exchange Act. Accordingly, the holders of a majority of the outstanding shares of Class A common stock entitled to vote in any election can elect all of the directors standing for election, if they so choose, other than any directors that holders of any preferred stock we may issue may be entitled to elect.

Holders of common stock are entitled to receive proportionately any dividends as may be declared by our board of directors, subject to any preferential dividend rights of any series of preferred stock that we may designate and issue in the future.

In the event of our liquidation or dissolution, the holders of Class A common stock are entitled to receive proportionately our net assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any outstanding preferred stock. Holders of Class A common stock have no preemptive, subscription, redemption or conversion rights. Our outstanding shares of Class A common stock are, and the shares offered by us in this offering will be, when issued and paid for, validly issued, fully paid and nonassessable. The rights, preferences and privileges of holders of Class A common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Preferred stock

Under the terms of our restated certificate of incorporation that will become effective upon the closing of this offering, our board of directors is authorized to direct us to issue shares of preferred stock in one or more series without stockholder approval. Our board of directors has the discretion to determine the rights, preferences, privileges and restrictions, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation preferences, of each series of preferred stock.

The purpose of authorizing our board of directors to issue preferred stock and determine its rights and preferences is to eliminate delays associated with a stockholder vote on specific issuances. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions, future financings and other corporate purposes, could have the effect of making it more difficult for a third party to acquire, or could discourage a third party from seeking to acquire, a majority of our outstanding voting stock. Upon the closing of this offering, there will be no shares of preferred stock outstanding, and we have no present plans to issue any shares of preferred stock.

Options and restricted stock

As of May 31, 2021, options to purchase 20,847,569 shares of our Class A common stock were outstanding under our 2010 Plan, of which 9,131,359 were exercisable and of which 11,716,210 were unvested as of that date. As of May 31, 2021, restricted stock covering 1,332,255 shares of our Class A common stock were outstanding under our 2010 Plan.

Warrants

As of May 31, 2021, warrants to purchase 279,340 shares of our Class A common stock at an exercise price of $ per share were outstanding. Upon the closing of this offering, these warrants will automatically become exercisable for 279,340 shares of our Class A common stock at an exercise price of $27.44 per share.

As of May 31, 2021, warrants to purchase 3,823,524 shares of our Series A1 preferred stock at an exercise price of $0.01 per share were outstanding. Upon the closing of this offering, these warrants will automatically become exercisable for 3,823,524 shares of our Class A common stock at an exercise price of $0.01 per share.

As of May 31, 2021, warrants to purchase 1,199,994 shares of our Series B1 preferred stock at an exercise price of $0.01 per share were outstanding. Upon the closing of this offering, these warrants will automatically become exercisable for 1,199,994 shares of our Class A common stock at an exercise price of $0.01 per share.

As of May 31, 2021, warrants to purchase 1,195,652 shares of our Series C1 preferred stock at an exercise price of $1.15 per share were outstanding. Upon the closing of this offering, these warrants will automatically become exercisable for 1,195,652 shares of our Class A common stock at an exercise price of $1.15 per share.

Registration rights

Holders of shares of our common stock are entitled to certain rights with respect to the registration of such shares for public resale under the Securities Act, pursuant to an amended and restated investors' rights agreement by and among us and certain of our stockholders, until the rights otherwise terminate pursuant to the terms of the investors' rights agreement. The registration of shares of common stock as a result of the following

rights being exercised would enable holders to trade these shares without restriction under the Securities Act when the applicable registration statement is declared effective.

Form S-1 registration rights

If at any time after the earlier of (i) three years after the date of our Seventh Amended and Restated Investors' Rights Agreement or (ii) 180 days after the effective date of the registration statement of which this prospectus is a part, the holders of a majority of our registrable securities request in writing that we effect a registration with respect to all or part of such registrable securities then outstanding and having an anticipated aggregate offering price of at least $50,000,000, we may be required to register their shares. We are obligated to effect at most two registrations in response to these demand registration rights. If the holders requesting registration intend to distribute their shares by means of an underwriting, the managing underwriter of such offering will have the right to limit the numbers of shares to be underwritten for reasons related to the marketing of the shares.

Piggyback registration rights

If at any time after this offering we propose to register any shares of our common stock under the Securities Act, subject to certain exceptions, the holders of registrable securities will be entitled to notice of the registration and to include their shares of registrable securities in the registration. If our proposed registration involves an underwriting, the managing underwriter of such offering will have the right to limit the number of shares to be underwritten for reasons related to the marketing of the shares.

Form S-3 registration rights

If, at any time after we become entitled under the Securities Act to register our shares on a registration statement on Form S-3, the holders of at least twenty percent of our registrable securities request in writing that we effect a registration with respect to registrable securities at an aggregate price to the public in the offering of at least $3,000,000, we will be required to effect such registration; provided, however, that we will not be required to effect such a registration if, within any twelve month period, we have already effected two registrations on Form S-3 for the holders of registrable securities.

Expenses and indemnification

Ordinarily, other than underwriting discounts and commissions, we will be required to pay all expenses incurred by us related to any registration effected pursuant to the exercise of these registration rights. These expenses may include all registration and filing fees, printing expenses, fees and disbursements of our counsel, reasonable fees and disbursements of a counsel for the selling securityholders and blue sky fees and expenses. Additionally, we have agreed to indemnify selling stockholders for damages, and any legal or other expenses reasonably incurred, arising from or based upon any untrue statement of a material fact contained in any registration statement, an omission or alleged omission to state a material fact in any registration statement or necessary to make the statements therein not misleading, or any violation or alleged violation by the indemnifying party of securities laws, subject to certain exceptions.

Termination of registration rights

The registration rights terminate upon the earlier of (i) the closing of a deemed liquidation event (as such term is defined in our restated certificate of incorporation) or a SPAC Transaction (as such term is defined in our Seventh Amended and Restated Investors' Rights Agreement), (ii) such time as Rule 144 of the Securities Act or another similar exemption under the Securities Act is available for the sale of all shares held by a holder of our registrable securities without limitation during a three-month period without registration, and (iii) three years after the effective date of the registration statement of which this prospectus is a part.

Anti-takeover effects of Delaware law and our certificate of incorporation and bylaws

Some provisions of Delaware law, our restated certificate of incorporation and our amended and restated bylaws could make the following transactions more difficult: an acquisition of us by means of a tender offer; an

acquisition of us by means of a proxy contest or otherwise; or the removal of our incumbent officers and directors. It is possible that these provisions could make it more difficult to accomplish or could deter transactions that stockholders may otherwise consider to be in their best interest or in our best interests, including transactions which provide for payment of a premium over the market price for our shares.

These provisions, summarized below, are intended to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our board of directors. We believe that the benefits of the increased protection of our potential ability to negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure us outweigh the disadvantages of discouraging these proposals because negotiation of these proposals could result in an improvement of their terms.

Undesignated preferred stock

The ability of our board of directors, without action by the stockholders, to issue up to shares of undesignated preferred stock with voting or other rights or preferences as designated by our board of directors could impede the success of any attempt to change control of us. These and other provisions may have the effect of deferring hostile takeovers or delaying changes in control or management of our company.

Stockholder meetings

Our amended and restated bylaws provide that a special meeting of stockholders may be called only by our chairman of the board, chief executive officer or president (in the absence of a chief executive officer), or by a resolution adopted by a majority of our board of directors.

Requirements for advance notification of stockholder nominations and proposals

Our amended and restated bylaws establish advance notice procedures with respect to stockholder proposals to be brought before a stockholder meeting and the nomination of candidates for election as directors, other than nominations made by or at the direction of the board of directors or a committee of the board of directors.

Elimination of stockholder action by written consent

Our restated certificate of incorporation eliminates the right of stockholders to act by written consent without a meeting.

Staggered board

Our board of directors is divided into three classes. The directors in each class will serve for a three-year term, one class being elected each year by our stockholders. For more information on the classified board, see “Management—Board Composition and Election of Directors.” This system of electing and removing directors may tend to discourage a third-party from making a tender offer or otherwise attempting to obtain control of us, because it generally makes it more difficult for stockholders to replace a majority of the directors.

Removal of directors

Our restated certificate of incorporation provides that no member of our board of directors may be removed from office by our stockholders except for cause and, in addition to any other vote required by law, upon the approval of the holders of at least two-thirds in voting power of the outstanding shares of stock entitled to vote in the election of directors.

Stockholders not entitled to cumulative voting

Our restated certificate of incorporation does not permit stockholders to cumulate their votes in the election of directors. Accordingly, the holders of a majority of the outstanding shares of our Class A common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they choose, other than any directors that holders of our preferred stock may be entitled to elect.

Delaware anti-takeover statute

We are subject to Section 203 of the General Corporation Law of the State of Delaware, which prohibits persons deemed to be "interested stockholders" from engaging in a "business combination" with a publicly held Delaware corporation for three years following the date these persons become interested stockholders unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. Generally, an "interested stockholder" is a person who, together with affiliates and associates, owns, or within three years prior to the determination of interested stockholder status did own, 15% or more of a corporation's voting stock. Generally, a "business combination" includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. The existence of this provision may have an anti-takeover effect with respect to transactions not approved in advance by the board of directors.

Choice of forum

Our restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative form, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for: (1) any derivative action or proceeding brought on our behalf; (2) any action asserting a claim of breach of a fiduciary duty or other wrongdoing by any of our directors, officers, employees or agents to us or our stockholders; (3) any action asserting a claim against us arising pursuant to any provision of the General Corporation Law of the State of Delaware or our certificate of incorporation or bylaws; (4) any action to interpret, apply, enforce or determine the validity of our certificate of incorporation or bylaws; or (5) any action asserting a claim governed by the internal affairs doctrine. Under our restated certificate of incorporation, this exclusive forum provision will not apply to claims which are vested in the exclusive jurisdiction of a court or forum other than the Court of Chancery of the State of Delaware, or for which the Court of Chancery of the State of Delaware does not have subject matter jurisdiction. For instance, the provision would not apply to actions arising under federal securities laws, including suits brought to enforce any liability or duty created by the Securities Act, Exchange Act, or the rules and regulations thereunder. Our restated certificate of incorporation further provides that, unless we consent in writing to the section of an alternative forum, the federal district courts of the United States of America, shall, to the fullest extent permitted by law, be the sole and exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act. Our restated certificate of incorporation also provides that any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock will be deemed to have notice of and to have consented to these choice of forum provisions. It is possible that a court of law could rule that either or both of the choice of forum provisions contained in our restated certificate of incorporation are inapplicable or unenforceable if they are challenged in a proceeding or otherwise.

Amendment of charter provisions

The amendment of any of the above provisions, except for the provision making it possible for our board of directors to issue preferred stock and the provision prohibiting cumulative voting, would require approval by holders of at least two-thirds in voting power of the outstanding shares of stock entitled to vote thereon.

The provisions of Delaware law, our restated certificate of incorporation and our amended and restated bylaws could have the effect of discouraging others from attempting hostile takeovers and, as a consequence, they may also inhibit temporary fluctuations in the market price of our Class A common stock that often result from actual or rumored hostile takeover attempts. These provisions may also have the effect of preventing changes in the composition of our board and management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders may otherwise deem to be in their best interests.

Transfer agent and registrar

The transfer agent and registrar for our Class A common stock and Class B common stock Computershare Trust Company, N.A.

Stock exchange listing

We have applied to list our common stock listed on The Nasdaq Global Market under the symbol "RPID."

Shares eligible for future sale

Immediately prior to this offering, there was no public market for our Class A common stock. Future sales of substantial amounts of Class A common stock in the public market, or the perception that such sales may occur, could adversely affect the market price of our Class A common stock.

Upon the closing of this offering, based on the number of shares of our capital stock outstanding as of , 2021, we will have outstanding shares of Class A common stock and shares of Class B common stock, assuming (i) the issuance of shares of Class A common stock offered by us in this offering, (ii) the automatic conversion of all shares of our outstanding Series A1, B1, C1 and D1 preferred stock into an aggregate of 121,004,726 shares of our Class A common stock, (iii) the automatic conversion of all shares of our outstanding Series C2 and D2 preferred stock into an aggregate of 34,516,907 shares of our Class B common stock and (iv) no exercise of options after , 2021. Of these shares, all shares sold in this offering will be freely tradable without restriction or further registration under the Securities Act, except for any shares purchased by our "affiliates," as that term is defined in Rule 144 under the Securities Act, whose sales would be subject to the Rule 144 resale restrictions described below, other than the holding period requirement.

The remaining shares of Class A common stock and shares of Class B common stock will be "restricted securities," as that term is defined in Rule 144 under the Securities Act. These restricted securities are eligible for public sale only if they are registered under the Securities Act or if they qualify for an exemption from registration under Rules 144 or 701 under the Securities Act, which are summarized below. We expect that substantially all of these shares will be subject to the 180-day lock-up period under the lock-up agreements described below. Upon expiration of the lock-up period, we estimate that approximately shares will be available for sale in the public market, subject in some cases to applicable volume limitations under Rule 144.

In addition, of the shares of our Class A common stock that were subject to stock options outstanding as of , 2021, options to purchase shares of Class A common stock were vested as of , 2021 and, upon exercise, these shares will be eligible for sale subject to the lock-up agreements described below and Rules 144 and 701 under the Securities Act.

Lock-up agreements

We and each of our directors and executive officers and holders of substantially all of our outstanding capital stock, have agreed that, without the prior written consent of J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC, we and they will not, subject to certain exceptions, during the period ending 180 days after the date of this prospectus, offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for common stock; or enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of our common stock, whether any transaction described above is to be settled by delivery of our common stock or such other securities, in cash or otherwise.

Upon the expiration of the applicable lock-up periods, substantially all of the shares subject to such lock-up restrictions will become eligible for sale, subject to the limitations discussed above. For a further description of these lock-up agreements, please see "Underwriting."

Rule 144

Affiliate resales of restricted securities

In general, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is an affiliate of ours, or who was an affiliate at any time during the 90 days before a sale, who has beneficially owned shares of our Class A common stock for at least six months would be entitled to sell

in “broker’s transactions” or certain “riskless principal transactions” or to market makers, a number of shares within any three-month period that does not exceed the greater of:

- 1% of the number of shares of our Class A common stock then outstanding, which will equal approximately shares immediately after this offering; or
- the average weekly trading volume in our Class A common stock on The Nasdaq Global Market during the four calendar weeks preceding the filing of a notice on Form 144 with respect to such sale.

Affiliate resales under Rule 144 are also subject to the availability of current public information about us. In addition, if the number of shares being sold under Rule 144 by an affiliate during any three-month period exceeds 5,000 shares or has an aggregate sale price in excess of $50,000, the seller must file a notice on Form 144 with the Securities and Exchange Commission and Nasdaq concurrently with either the placing of a sale order with the broker or the execution directly with a market maker.

Non-affiliate resales of restricted securities

In general, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is not an affiliate of ours at the time of sale, and has not been an affiliate at any time during the three months preceding a sale, and who has beneficially owned shares of our Class A common stock for at least six months but less than a year, is entitled to sell such shares subject only to the availability of current public information about us. If such person has held our shares for at least one year, such person can resell under Rule 144(b)(1) without regard to any Rule 144 restrictions, including the 90-day public company requirement and the current public information requirement.

Non-affiliate resales are not subject to the manner of sale, volume limitation or notice filing provisions of Rule 144.

Rule 701

In general, under Rule 701, any of an issuer’s employees, directors, officers, consultants or advisors who purchases shares from the issuer in connection with a compensatory stock or option plan or other written agreement before the effective date of a registration statement under the Securities Act is entitled to sell such shares 90 days after such effective date in reliance on Rule 144. An affiliate of the issuer can resell shares in reliance on Rule 144 without having to comply with the holding period requirement, and non-affiliates of the issuer can resell shares in reliance on Rule 144 without having to comply with the current public information and holding period requirements.

The Securities and Exchange Commission has indicated that Rule 701 will apply to typical stock options granted by an issuer before it becomes subject to the reporting requirements of the Exchange Act, along with the shares acquired upon exercise of such options, including exercises after an issuer becomes subject to the reporting requirements of the Exchange Act.

Equity plans

We intend to file one or more registration statements on Form S-8 under the Securities Act to register all shares of Class A common stock subject to outstanding stock options and common stock issued or issuable under our stock plans. We expect to file the registration statement covering shares offered pursuant to our stock plans shortly after the date of this prospectus, permitting the resale of such shares by non-affiliates in the public market without restriction under the Securities Act and the sale by affiliates in the public market, subject to compliance with the resale provisions of Rule 144.

Registration rights

Upon the closing of this offering, the holders of shares of common stock, which includes all of the shares of Class A common stock issuable upon the automatic conversion of our Series A1, B1, C1 and D1 preferred stock and all shares of our Class B common stock issuable upon automatic conversion of our Series C2

and D2 preferred stock upon the closing of this offering, or their transferees will be entitled to various rights with respect to the registration of these shares under the Securities Act. Registration of these shares under the Securities Act would result in these shares becoming fully tradable without restriction under the Securities Act immediately upon the effectiveness of the registration, except for shares purchased by affiliates. See “Description of Capital Stock—Registration Rights” for additional information. Shares covered by a registration statement will be eligible for sale in the public market upon the expiration or release from the terms of the lock-up agreement described above.

Material U.S. federal income tax consequences to Non-U.S. Holders

The following discussion is a summary of the material U.S. federal income tax consequences to Non-U.S. Holders (as defined below) of the purchase, ownership, and disposition of our Class A common stock issued pursuant to this offering, but does not purport to be a complete analysis of all potential tax effects. The effects of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local, or non-U.S. tax laws are not discussed. This discussion is based on the U.S. Internal Revenue Code of 1986, as amended, or the Code, Treasury Regulations promulgated thereunder, judicial decisions, and published rulings and administrative pronouncements of the U.S. Internal Revenue Service, or the IRS, in each case in effect as of the date hereof. These authorities may change or be subject to differing interpretations. Any such change or differing interpretation may be applied retroactively in a manner that could adversely affect a Non-U.S. Holder. We have not sought and will not seek any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a contrary position to that discussed below regarding the tax consequences of the purchase, ownership, and disposition of our Class A common stock.

This discussion is limited to Non-U.S. Holders that hold our Class A common stock as a "capital asset" within the meaning of Section 1221 of the Code (generally, property held for investment). This discussion does not address all U.S. federal income tax consequences relevant to a Non-U.S. Holder's particular circumstances, including the impact of the Medicare contribution tax on net investment income and the alternative minimum tax. In addition, it does not address consequences relevant to Non-U.S. Holders subject to special rules, including, without limitation:

- U.S. expatriates and former citizens or long-term residents of the United States;
- persons holding our Class A common stock as part of a hedge, straddle, or other risk reduction strategy or as part of a conversion transaction or other integrated investment;
- banks, insurance companies, and other financial institutions;
- brokers, dealers, or traders in securities;
- "controlled foreign corporations," "passive foreign investment companies," and corporations that accumulate earnings to avoid U.S. federal income tax;
- partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes (and investors therein);
- tax-exempt organizations or governmental organizations;
- persons deemed to sell our Class A common stock under the constructive sale provisions of the Code;
- persons who hold or receive our Class A common stock pursuant to the exercise of any employee stock option or otherwise as compensation;
- tax-qualified retirement plans; and
- "qualified foreign pension funds" as defined in Section 897(l)(2) of the Code and entities all of the interests of which are held by qualified foreign pension funds.

If an entity treated as a partnership for U.S. federal income tax purposes holds our Class A common stock, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of the partnership, and certain determinations made at the partner level. Accordingly, partnerships holding our Class A common stock and the partners in such partnerships should consult their tax advisors regarding the U.S. federal income tax consequences to them.

THIS DISCUSSION IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT TAX ADVICE. INVESTORS SHOULD CONSULT THEIR TAX ADVISORS WITH RESPECT TO THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AS WELL AS ANY TAX CONSEQUENCES OF THE PURCHASE, OWNERSHIP, AND DISPOSITION OF OUR CLASS A COMMON STOCK ARISING UNDER THE U.S. FEDERAL ESTATE OR GIFT TAX

LAWS OR UNDER THE LAWS OF ANY STATE, LOCAL, OR NON-U.S. TAXING JURISDICTION OR UNDER ANY APPLICABLE INCOME TAX TREATY.

Definition of a Non-U.S. Holder

For purposes of this discussion, a "Non-U.S. Holder" is any beneficial owner of our Class A common stock that is neither a "U.S. person" nor an entity treated as a partnership for U.S. federal income tax purposes. A U.S. person is any person that, for U.S. federal income tax purposes, is or is treated as any of the following:

- an individual who is a citizen or resident of the United States;
- a corporation created or organized under the laws of the United States, any state thereof, or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (1) is subject to the primary supervision of a U.S. court and the control of one or more "United States persons" (within the meaning of Section 7701(a)(30) of the Code), or (2) has a valid election in effect to be treated as a United States person for U.S. federal income tax purposes.

Distributions

As described in the section entitled "Dividend policy," we do not anticipate declaring or paying any dividends to holders of our Class A common stock in the foreseeable future. However, if we make distributions of cash or property on our Class A common stock, such distributions will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. Amounts not treated as dividends for U.S. federal income tax purposes will constitute a return of capital and first be applied against and reduce a Non-U.S. Holder's adjusted tax basis in its Class A common stock, but not below zero. Any excess will be treated as capital gain and will be treated as described below under "—Sale or other taxable disposition."

Subject to the discussion below on effectively connected income, dividends paid to a Non-U.S. Holder will be subject to U.S. federal withholding tax at a rate of 30% of the gross amount of the dividends (or such lower rate specified by an applicable income tax treaty, provided the Non-U.S. Holder furnishes a valid IRS Form W-8BEN or W-8BEN-E (or other applicable documentation) certifying qualification for the lower treaty rate). A Non-U.S. Holder that does not timely furnish the required documentation, but that qualifies for a reduced treaty rate, may obtain a refund of any excess amounts withheld by timely filing an appropriate claim for refund with the IRS. Non-U.S. Holders should consult their tax advisors regarding their entitlement to benefits under any applicable income tax treaty.

If dividends paid to a Non-U.S. Holder are effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the Non-U.S. Holder maintains a permanent establishment in the United States to which such dividends are attributable), the Non-U.S. Holder will be exempt from the U.S. federal withholding tax described above. To claim the exemption, the Non-U.S. Holder must furnish to the applicable withholding agent a valid IRS Form W-8ECI, certifying that the dividends are effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States.

Any such effectively connected dividends will be subject to U.S. federal income tax on a net income basis at the regular rates. A Non-U.S. Holder that is a corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected dividends, as adjusted for certain items. Non-U.S. Holders should consult their tax advisors regarding any applicable tax treaties that may provide for different rules.

Sale or other taxable disposition

A Non-U.S. Holder will not be subject to U.S. federal income tax on any gain realized upon the sale or other taxable disposition of our Class A common stock unless:

- the gain is effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the Non-U.S. Holder maintains a permanent establishment in the United States to which such gain is attributable);
- the Non-U.S. Holder is a nonresident alien individual present in the United States for 183 days or more during the taxable year of the disposition and certain other requirements are met; or
- our Class A common stock constitutes a U.S. real property interest, or USRPI, by reason of our status as a U.S. real property holding corporation, or USRPHC, for U.S. federal income tax purposes.

Gain described in the first bullet point above generally will be subject to U.S. federal income tax on a net income basis at the regular rates. A Non-U.S. Holder that is a corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected gain, as adjusted for certain items.

A Non-U.S. Holder described in the second bullet point above will be subject to U.S. federal income tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on gain realized upon the sale or other taxable disposition of our Class A common stock, which may be offset by U.S. source capital losses of the Non-U.S. Holder (even though the individual is not considered a resident of the United States), provided the Non-U.S. Holder has timely filed U.S. federal income tax returns with respect to such losses.

With respect to the third bullet point above, we believe we currently are not, and do not anticipate becoming, a USRPHC. Because the determination of whether we are a USRPHC depends, however, on the fair market value of our USRPIs relative to the fair market value of our non-U.S. real property interests and our other business assets, there can be no assurance we currently are not a USRPHC or will not become one in the future. Even if we are or were to become a USRPHC, gain arising from the sale or other taxable disposition of our Class A common stock by a Non-U.S. Holder will not be subject to U.S. federal income tax if our Class A common stock is "regularly traded," as defined by applicable Treasury Regulations, on an established securities market and such Non-U.S. Holder owned, actually and constructively, 5% or less of our Class A common stock throughout the shorter of the five-year period ending on the date of the sale or other taxable disposition or the Non-U.S. Holder's holding period.

Non-U.S. Holders should consult their tax advisors regarding potentially applicable income tax treaties that may provide for different rules.

Information reporting and backup withholding

Payments of dividends on our Class A common stock will not be subject to backup withholding, provided the applicable withholding agent does not have actual knowledge or reason to know the holder is a United States person and the holder either certifies its non-U.S. status, such as by furnishing a valid IRS Form W-8BEN, W-8BEN-E, or W-8ECI, or otherwise establishes an exemption. However, information returns are required to be filed with the IRS in connection with any distributions on our Class A common stock paid to the Non-U.S. Holder, regardless of whether such distributions constitute dividends or whether any tax was actually withheld. In addition, proceeds of the sale or other taxable disposition of our Class A common stock within the United States or conducted through certain U.S.-related brokers generally will not be subject to backup withholding or information reporting if the applicable withholding agent receives the certification described above and does not have actual knowledge or reason to know that such holder is a United States person or the holder otherwise establishes an exemption. Proceeds of a disposition of our Class A common stock conducted through a non-U.S. office of a non-U.S. broker generally will not be subject to backup withholding or information reporting.

Copies of information returns that are filed with the IRS may also be made available under the provisions of an applicable treaty or agreement to the tax authorities of the country in which the Non-U.S. Holder resides or is established.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a Non-U.S. Holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

Additional withholding tax on payments made to foreign accounts

Withholding taxes may be imposed under Sections 1471 to 1474 of the Code (such Sections commonly referred to as the Foreign Account Tax Compliance Act, or FATCA) on certain types of payments made to non-U.S. financial institutions and certain other non-U.S. entities. Specifically, a 30% withholding tax may be imposed on dividends on, or (subject to the proposed Treasury Regulations discussed below) gross proceeds from the sale or other disposition of, our Class A common stock paid to a "foreign financial institution" or a "non-financial foreign entity" (each as defined in the Code), unless (1) the foreign financial institution undertakes certain diligence and reporting obligations, (2) the non-financial foreign entity either certifies it does not have any "substantial United States owners" (as defined in the Code) or furnishes identifying information regarding each substantial United States owner, or (3) the foreign financial institution or non-financial foreign entity otherwise qualifies for an exemption from these rules. If the payee is a foreign financial institution and is subject to the diligence and reporting requirements in clause (1) above, it must enter into an agreement with the U.S. Department of the Treasury requiring, among other things, that it undertake to identify accounts held by certain "specified United States persons" or "United States owned foreign entities" (each as defined in the Code), annually report certain information about such accounts, and withhold 30% on certain payments to non-compliant foreign financial institutions and certain other account holders. Foreign financial institutions located in jurisdictions that have an intergovernmental agreement with the United States governing FATCA may be subject to different rules.

Under the applicable Treasury Regulations and administrative guidance, withholding under FATCA generally applies to payments of dividends on our Class A common stock. While withholding under FATCA would have applied also to payments of gross proceeds from the sale or other disposition of stock on or after January 1, 2019, proposed Treasury Regulations eliminate FATCA withholding on payments of gross proceeds entirely. Taxpayers generally may rely on these proposed Treasury Regulations until final Treasury Regulations are issued.

Prospective investors should consult their tax advisors regarding the potential application of withholding under FATCA to their investment in our Class A common stock.

Underwriting

We are offering the shares of Class A common stock described in this prospectus through a number of underwriters. J.P. Morgan Securities LLC, Morgan Stanley & Co. LLC and Cowen and Company, LLC are acting as joint book-running managers of the offering and as representatives of the underwriters. We have entered into an underwriting agreement with the underwriters. Subject to the terms and conditions of the underwriting agreement, we have agreed to sell to the underwriters, and each underwriter has severally agreed to purchase, at the public offering price less the underwriting discounts and commissions set forth on the cover page of this prospectus, the number of shares of Class A common stock listed next to its name in the following table:

Name	Number of Shares
J.P. Morgan Securities LLC	
Morgan Stanley & Co. LLC	
Cowen and Company, LLC	
Stifel, Nicolaus & Company, Incorporated	
Total	

The underwriters are committed to purchase all the common shares offered by us if they purchase any shares. The underwriting agreement also provides that if an underwriter defaults, the purchase commitments of non-defaulting underwriters may also be increased or the offering may be terminated.

The underwriters propose to offer the common shares directly to the public at the initial public offering price set forth on the cover page of this prospectus and to certain dealers at that price less a concession not in excess of $ per share. Any such dealers may resell shares to certain other brokers or dealers at a discount of up to $ per share from the initial public offering price. After the initial offering of the shares to the public, if all of the common shares are not sold at the initial public offering price, the underwriters may change the offering price and the other selling terms. Sales of any shares made outside of the United States may be made by affiliates of the underwriters.

The underwriters have an option to buy up to additional shares of Class A common stock from us to cover sales of shares by the underwriters which exceed the number of shares specified in the table above. The underwriters have 30 days from the date of this prospectus to exercise this option to purchase additional shares. If any shares are purchased with this option to purchase additional shares, the underwriters will purchase shares in approximately the same proportion as shown in the table above. If any additional shares of Class A common stock are purchased, the underwriters will offer the additional shares on the same terms as those on which the shares are being offered.

The underwriting fee is equal to the public offering price per share of Class A common stock less the amount paid by the underwriters to us per share of Class A common stock. The underwriting fee is $ per share. The following table shows the per share and total underwriting discounts and commissions to be paid to the underwriters assuming both no exercise and full exercise of the underwriters' option to purchase additional shares.

	Without option to purchase additional shares exercise	With full option to purchase additional shares exercise
Per Share	$	$
Total	$	$

We estimate that the total expenses of this offering, including registration, filing and listing fees, printing fees and legal and accounting expenses, but excluding the underwriting discounts and commissions, will be approximately $.

A prospectus in electronic format may be made available on the web sites maintained by one or more underwriters, or selling group members, if any, participating in the offering. The underwriters may agree to allocate a number of shares to underwriters and selling group members for sale to their online brokerage account holders. Internet distributions will be allocated by the representatives to underwriters and selling group members that may make Internet distributions on the same basis as other allocations.

We have agreed that we will not (i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend or otherwise transfer or dispose of, directly or indirectly, or submit to, or file with, the Securities and Exchange Commission a registration statement under the Securities Act relating to, any shares of our common stock or securities convertible into or exercisable or exchangeable for any shares of our common stock, or publicly disclose the intention to make any offer, sale, pledge, loan, disposition or filing, or (ii) enter into any swap or other arrangement that transfers all or a portion of the economic consequences associated with the ownership of any shares of common stock or any such other securities (regardless of whether any of these transactions are to be settled by the delivery of shares of common stock or such other securities, in cash or otherwise), in each case without the prior written consent of J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC for a period of 180 days after the date of this prospectus, other than the shares of our common stock to be sold in this offering.

The restrictions on our actions, as described above, do not apply to certain transactions, including (i) the issuance of shares of common stock or securities convertible into or exercisable for shares of our common stock pursuant to the conversion or exchange of convertible or exchangeable securities or the exercise of warrants or options (including net exercise) or the settlement of RSUs (including net settlement), in each case outstanding on the date of the underwriting agreement and described in this prospectus; (ii) grants of stock options, stock awards, restricted stock, RSUs, or other equity awards and the issuance of shares of our common stock or securities convertible into or exercisable or exchangeable for shares of our common stock (whether upon the exercise of stock options or otherwise) to our employees, officers, directors, advisors, or consultants pursuant to the terms of an equity compensation plan in effect as of the closing of this offering and described in this prospectus; or (iii) our filing of any registration statement on Form S-8 relating to securities granted or to be granted pursuant to any plan in effect on the date of the underwriting agreement and described in this prospectus or any assumed benefit plan pursuant to an acquisition or similar strategic transaction.

Our directors and executive officers, and substantially all of our shareholders (such persons, the “lock-up parties”) have entered into lock-up agreements with the underwriters prior to the commencement of this offering pursuant to which each lock-up party, with limited exceptions, for a period of 180 days after the date of this prospectus (such period, the “restricted period”), may not (and may not cause any of their direct or indirect affiliates to), without the prior written consent of J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC, (1) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for our common stock (including, without limitation, common stock or such other securities which may be deemed to be beneficially owned by such lock-up parties in accordance with the rules and regulations of the SEC and securities which may be issued upon exercise of a stock option or warrant (collectively with the common stock, the “lock-up securities”)), (2) enter into any hedging, swap or other agreement or transaction that transfers, in whole or in part, any of the economic consequences of ownership of the lock-up securities, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of lock-up securities, in cash or otherwise, (3) make any demand for, or exercise any right with respect to, the registration of any lock-up securities, or (4) publicly disclose the intention to do any of the foregoing. Such persons or entities have further acknowledged that these undertakings preclude them from engaging in any hedging or other transactions or arrangements (including, without limitation, any short sale or the purchase or sale of, or entry into, any put or call option, or combination thereof,

forward, swap or any other derivative transaction or instrument, however described or defined) designed or intended, or which could reasonably be expected to lead to or result in, a sale or disposition or transfer (by any person or entity, whether or not a signatory to such agreement) of any economic consequences of ownership, in whole or in part, directly or indirectly, of any lock-up securities, whether any such transaction or arrangement (or instrument provided for thereunder) would be settled by delivery of lock-up securities, in cash or otherwise.

The restrictions described in the immediately preceding paragraph and contained in the lock-up agreements between the underwriters and the lock-up parties do not apply, subject in certain cases to various conditions, to certain transactions, including (a) transfers or disposals of lock-up securities: (i) as bona fide gifts, or for bona fide estate planning purposes, (ii) by will or intestacy or other testamentary instrument, (iii) to any trust for the direct or indirect benefit of the lock-up party or any immediate family member, (iv) to a corporation, partnership, limited liability company, investment fund or other entity of which the lock-up party and its immediate family members are the legal and beneficial owner of all of the outstanding equity securities or similar interests or controlled by, or under common control with, the lock-up party or an immediate family member, (v) to a nominee or custodian of a person or entity to whom a disposition or transfer would be permissible under clauses (i) through (iv), (vi) in the case of a corporation, partnership, limited liability company, trust or other business entity, (A) to another corporation, partnership, limited liability company, trust or other business entity that is an affiliate of the lock-up party, or to any investment fund or other entity controlling, controlled by, managing or managed by or under common control or common investment management with the lock-up party or its affiliates or (B) as part of a distribution to limited partners, members, stockholders or other equity stakeholders of the lock-up party; (vii) by operation of law, (viii) to us upon death, disability or termination of employment or other service relationship, (ix) as part of a sale of lock-up securities acquired in this offering or in open market transactions after the completion of this offering, (x) to us in connection with the vesting, settlement or exercise of restricted stock units, options or other rights to purchase shares of our common stock (including “net” or “cashless” exercise), including for the payment of exercise price and tax and remittance payments, (xi) to us in connection with the exercise of warrants to purchase shares of our common stock (including “net” or “cashless” exercise), including for the payment of exercise price and tax and remittance payments or (xii) pursuant to a bona fide third-party tender offer, merger, consolidation or other similar transaction approved by our board of directors and made to all shareholders involving a change in control, provided that if such transaction is not completed, all such lock-up securities would remain subject to the restrictions in the immediately preceding paragraph; (b) exercise of the options, settlement of RSUs or other equity awards, or the exercise of warrants granted pursuant to plans described in this prospectus, provided that any lock-up securities received upon such exercise, vesting or settlement would be subject to restrictions similar to those in the immediately preceding paragraph; (c) the conversion of outstanding preferred stock, warrants to acquire preferred stock, or convertible securities into shares of our common stock or warrants to acquire shares of our common stock, provided that any common stock or warrant received upon such conversion would be subject to restrictions similar to those in the immediately preceding paragraph; and (d) the establishment by lock-up parties of trading plans under Rule 10b5-1 under the Exchange Act, provided that such plan does not provide for the transfer of lock-up securities during the restricted period.

J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC in their sole discretion, may release the securities subject to any of the lock-up agreements with the underwriters described above, in whole or in part at any time.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act of 1933.

We have applied to have our Class A common stock approved for listing/quotation on The Nasdaq Global Market under the symbol “RPID”.

In connection with this offering, the underwriters may engage in stabilizing transactions, which involves making bids for, purchasing and selling shares of common stock in the open market for the purpose of preventing or retarding a decline in the market price of the common stock while this offering is in progress. These stabilizing transactions may include making short sales of common stock, which involves the sale by the underwriters of a greater number of shares of common stock than they are required to purchase in this offering, and purchasing shares of common stock on the open market to cover positions created by short sales. Short sales may be “covered”

shorts, which are short positions in an amount not greater than the underwriters' option to purchase additional shares referred to above, or may be "naked" shorts, which are short positions in excess of that amount. The underwriters may close out any covered short position either by exercising their option to purchase additional shares, in whole or in part, or by purchasing shares in the open market. In making this determination, the underwriters will consider, among other things, the price of shares available for purchase in the open market compared to the price at which the underwriters may purchase shares through the option to purchase additional shares. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the common stock in the open market that could adversely affect investors who purchase in this offering. To the extent that the underwriters create a naked short position, they will purchase shares in the open market to cover the position.

The underwriters have advised us that, pursuant to Regulation M of the Securities Act of 1933, they may also engage in other activities that stabilize, maintain or otherwise affect the price of the Class A common stock, including the imposition of penalty bids. This means that if the representatives of the underwriters purchase common stock in the open market in stabilizing transactions or to cover short sales, the representatives can require the underwriters that sold those shares as part of this offering to repay the underwriting discount received by them.

These activities may have the effect of raising or maintaining the market price of the common stock or preventing or retarding a decline in the market price of the common stock, and, as a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. If the underwriters commence these activities, they may discontinue them at any time. The underwriters may carry out these transactions on The Nasdaq Global Market, in the over-the-counter market or otherwise.

Prior to this offering, there has been no public market for our Class A common stock. The initial public offering price will be determined by negotiations between us and the representatives of the underwriters. In determining the initial public offering price, we and the representatives of the underwriters expect to consider a number of factors including:

- the information set forth in this prospectus and otherwise available to the representatives;
- our prospects and the history and prospects for the industry in which we compete;
- an assessment of our management;
- our prospects for future earnings;
- the general condition of the securities markets at the time of this offering;
- the recent market prices of, and demand for, publicly traded common stock of generally comparable companies; and
- other factors deemed relevant by the underwriters and us.

Neither we nor the underwriters can assure investors that an active trading market will develop for our common shares, or that the shares will trade in the public market at or above the initial public offering price.

Other than in the United States, no action has been taken by us or the underwriters that would permit a public offering of the securities offered by this prospectus in any jurisdiction where action for that purpose is required. The securities offered by this prospectus may not be offered or sold, directly or indirectly, nor may this prospectus or any other offering material or advertisements in connection with the offer and sale of any such securities be distributed or published in any jurisdiction, except under circumstances that will result in compliance with the applicable rules and regulations of that jurisdiction. Persons into whose possession this prospectus comes are advised to inform themselves about and to observe any restrictions relating to the offering and the distribution of this prospectus. This prospectus does not constitute an offer to sell or a solicitation of an offer to buy any securities offered by this prospectus in any jurisdiction in which such an offer or a solicitation is unlawful.

Certain of the underwriters and their affiliates have provided in the past to us and our affiliates and may provide from time to time in the future certain commercial banking, financial advisory, investment banking and other services for us and such affiliates in the ordinary course of their business, for which they have received and may continue to receive customary fees and commissions. J.P. Morgan Securities LLC, one of the underwriters, acted as placement agent in connection with our private placement of Series D1 and Series D2 preferred stock in March 2021, and received a placement fee in consideration for its services. In addition, from time to time, certain of the underwriters and their affiliates may effect transactions for their own account or the account of customers, and hold on behalf of themselves or their customers, long or short positions in our debt or equity securities or loans, and may do so in the future.

Selling restrictions

Other than in the United States, no action has been taken by us or the underwriters that would permit a public offering of the securities offered by this prospectus in any jurisdiction where action for that purpose is required. The securities offered by this prospectus may not be offered or sold, directly or indirectly, nor may this prospectus or any other offering material or advertisements in connection with the offer and sale of any such securities be distributed or published in any jurisdiction, except under circumstances that will result in compliance with the applicable rules and regulations of that jurisdiction. Persons into whose possession this prospectus comes are advised to inform themselves about and to observe any restrictions relating to the offering and the distribution of this prospectus. This prospectus does not constitute an offer to sell or a solicitation of an offer to buy any securities offered by this prospectus in any jurisdiction in which such an offer or a solicitation is unlawful.

European Economic Area

In relation to each Member State of the European Economic Area (each a "Relevant State"), no shares have been offered or will be offered pursuant to the offering to the public in that Relevant State prior to the publication of a prospectus in relation to the shares which has been approved by the competent authority in that Relevant State or, where appropriate, approved in another Relevant State and notified to the competent authority in that Relevant State, all in accordance with the Prospectus Regulation, except that offers of shares may be made to the public in that Relevant State at any time under the following exemptions under the Prospectus Regulation:

(a) to any legal entity which is a qualified investor as defined under Article 2 of the Prospectus Regulation;

(b) to fewer than 150 natural or legal persons (other than qualified investors as defined under Article 2 of the Prospectus Regulation), subject to obtaining the prior consent of the Representatives for any such offer; or

(c) in any other circumstances falling within Article 1(4) of the Prospectus Regulation,

provided that no such offer of shares shall require the Issuer or any underwriter to publish a prospectus pursuant to Article 3 of the Prospectus Regulation or supplement a prospectus pursuant to Article 23 of the Prospectus Regulation and each person who initially acquires any shares or to whom any offer is made will be deemed to have represented, acknowledged and agreed to and with each of the underwriters and the Issuer that it is a "qualified investor" within the meaning of Article 2(e) of the Prospectus Regulation. In the case of any shares being offered to a financial intermediary as that term is used in the Prospectus Regulation, each such financial intermediary will be deemed to have represented, acknowledged and agreed that the shares acquired by it in the offer have not been acquired on a non-discretionary basis on behalf of, nor have they been acquired with a view to their offer or resale to, persons in circumstances which may give rise to an offer of any shares to the public other than their offer or resale in a Relevant State to qualified investors as so defined or in circumstances in which the prior consent of the underwriters has been obtained to each such proposed offer or resale.

For the purposes of this provision, the expression an "offer to the public" in relation to the shares in any Relevant State means the communication in any form and by any means of sufficient information on the terms of the offer and any shares to be offered so as to enable an investor to decide to purchase or subscribe for any shares, and the expression "Prospectus Regulation" means Regulation (EU) 2017/1129.

United Kingdom

No shares have been offered or will be offered pursuant to the offering to the public in the United Kingdom prior to the publication of a prospectus in relation to the shares which has been approved by the Financial Conduct Authority, except that the shares may be offered to the public in the United Kingdom at any time:

(a) to any legal entity which is a qualified investor as defined under Article 2 of the U.K. Prospectus Regulation;

(b) to fewer than 150 natural or legal persons (other than qualified investors as defined under Article 2 of the U.K. Prospectus Regulation), subject to obtaining the prior consent of the Representatives for any such offer; or

(c) in any other circumstances falling within Section 86 of the FSMA;

provided that no such offer of the shares shall require the Issuer or any underwriter to publish a prospectus pursuant to Section 85 of the FSMA or supplement a prospectus pursuant to Article 23 of the U.K. Prospectus Regulation. For the purposes of this provision, the expression an "offer to the public" in relation to the shares in the United Kingdom means the communication in any form and by any means of sufficient information on the terms of the offer and any shares to be offered so as to enable an investor to decide to purchase or subscribe for any shares and the expression "U.K. Prospectus Regulation" means Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the European Union (Withdrawal) Act 2018.

In addition, in the United Kingdom, this document is being distributed only to, and is directed only at, and any offer subsequently made may only be directed at persons who are "qualified investors" (as defined in the U.K. Prospectus Regulation) (i) who have professional experience in matters relating to investments falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, as amended, or the "Order," and/or (ii) who are high net worth companies (or persons to whom it may otherwise be lawfully communicated) falling within Article 49(2)(a) to (e) of the Order (all such persons together being referred to as "relevant persons") or otherwise in circumstances which have not resulted and will not result in an offer to the public of the shares in the United Kingdom within the meaning of the Financial Services and Markets Act 2000. In the United Kingdom, any investment or investment activity to which this document relates is only available to, and will be engaged in with, relevant persons. Any person in the UK who is not a relevant person must not act on or rely upon this document or any of its contents.

Notice to prospective investors in Canada

The shares may be sold only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 Prospectus Exemptions or subsection 73.3(1) of the Securities Act (Ontario), and are permitted clients, as defined in National Instrument 31-103 Registration Requirements, Exemptions and Ongoing Registrant Obligations. Any resale of the shares must be made in accordance with an exemption from, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this prospectus (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser's province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser's province or territory for particulars of these rights or consult with a legal advisor.

Pursuant to section 3A.3 of National Instrument 33-105 Underwriting Conflicts (NI 33-105), the underwriters are not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

Notice to prospective investors in Switzerland

The shares may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange, or SIX, or on any other stock exchange or regulated trading facility in Switzerland. This document does not constitute a prospectus within the meaning of, and has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this document nor any other offering or marketing material relating to the shares or the offering may be publicly distributed or otherwise made publicly available in Switzerland.

Neither this document nor any other offering or marketing material relating to the offering, the Company, the shares have been or will be filed with or approved by any Swiss regulatory authority. In particular, this document will not be filed with, and the offer of shares will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA, or FINMA, and the offer of shares has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes, or CISA. The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of shares.

Notice to prospective investors in Hong Kong

The shares have not been offered or sold and will not be offered or sold in Hong Kong, by means of any document, other than (a) to “professional investors” as defined in the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong), or the SFO, of Hong Kong and any rules made thereunder; or (b) in other circumstances which do not result in the document being a “prospectus” (as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32) of Hong Kong), or the CO, or which do not constitute an offer to the public within the meaning of the CO. No advertisement, invitation or document relating to the shares has been or may be issued or has been or may be in the possession of any person for the purposes of issue, whether in Hong Kong or elsewhere, which is directed at, or the contents of which are likely to be accessed or read by, the public of Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to shares which are or are intended to be disposed of only to persons outside Hong Kong or only to “professional investors” as defined in the SFO and any rules made thereunder.

Notice to prospective investors in Singapore

Each representative has acknowledged that this prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, each representative has represented and agreed that it has not offered or sold any shares or caused the shares to be made the subject of an invitation for subscription or purchase and will not offer or sell any shares or cause the shares to be made the subject of an invitation for subscription or purchase, and has not circulated or distributed, nor will it circulate or distribute, this prospectus or any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the shares, whether directly or indirectly, to any person in Singapore other than:

(a) to an institutional investor (as defined in Section 4A of the Securities and Futures Act (Chapter 289) of Singapore, as modified or amended from time to time, or the SFA) pursuant to Section 274 of the SFA;

(b) to a relevant person (as defined in Section 275(2) of the SFA) pursuant to Section 275(1) of the SFA, or any person pursuant to Section 275(1A) of the SFA, and in accordance with the conditions specified in Section 275 of the SFA; or

(c) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the shares are subscribed or purchased under Section 275 of the SFA by a relevant person which is:

(a) a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or

(b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary of the trust is an individual who is an accredited investor,

securities or securities-based derivatives contracts (each term as defined in Section 2(1) of the SFA) of that corporation or the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferred within six months after that corporation or that trust has acquired the shares pursuant to an offer made under Section 275 of the SFA except:

(i) to an institutional investor or to a relevant person, or to any person arising from an offer referred to in Section 275(1A) or Section 276(4)(i)(B) of the SFA;

(ii) where no consideration is or will be given for the transfer;

(iii) where the transfer is by operation of law;

(iv) as specified in Section 276(7) of the SFA; or

(v) as specified in Regulation 37A of the Securities and Futures (Offers of Investments) (Securities and Securities-based Derivatives Contracts) Regulations 2018.

Notice to prospective investors in Japan

The shares have not been and will not be registered pursuant to Article 4, Paragraph 1 of the Financial Instruments and Exchange Act. Accordingly, none of the shares nor any interest therein may be offered or sold, directly or indirectly, in Japan or to, or for the benefit of, any "resident" of Japan (which term as used herein means any person resident in Japan, including any corporation or other entity organized under the laws of Japan), or to others for re-offering or resale, directly or indirectly, in Japan or to or for the benefit of a resident of Japan, except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the Financial Instruments and Exchange Act and any other applicable laws, regulations and ministerial guidelines of Japan in effect at the relevant time.

Notice to prospective investors in the United Arab Emirates

The shares have not been, and are not being, publicly offered, sold, promoted or advertised in the United Arab Emirates (including the Dubai International Financial Centre) other than in compliance with the laws of the United Arab Emirates (and the Dubai International Financial Centre) governing the issue, offering and sale of securities. Further, this prospectus does not constitute a public offer of securities in the United Arab Emirates (including the Dubai International Financial Centre) and is not intended to be a public offer. This prospectus has not been approved by or filed with the Central Bank of the United Arab Emirates, the Securities and Commodities Authority or the Dubai Financial Services Authority.

Notice to prospective investors in Israel

In the State of Israel this prospectus shall not be regarded as an offer to the public to purchase shares of common stock under the Israeli Securities Law, 5728-1968, which requires a prospectus to be published and authorized by the Israel Securities Authority, if it complies with certain provisions of Section 15 of the Israeli Securities Law, 5728-1968, including, inter alia, if: (i) the offer is made, distributed or directed to not more than 35 investors, subject to certain conditions, or the Addressed Investors, or (ii) the offer is made, distributed or directed to certain qualified investors defined in the First Addendum of the Israeli Securities Law, 5728-1968, subject to certain conditions, or the Qualified Investors. The Qualified Investors shall not be taken into account in the count of the Addressed Investors and may be offered to purchase securities in addition to the 35 Addressed Investors. The company has not and will not take any action that would require it to publish a prospectus in accordance with and subject to the Israeli Securities Law, 5728-1968. We have not and will not distribute this prospectus or make, distribute or direct an offer to subscribe for our common stock to any person within the State of Israel, other than to Qualified Investors and up to 35 Addressed Investors.

Qualified Investors may have to submit written evidence that they meet the definitions set out in of the First Addendum to the Israeli Securities Law, 5728-1968. In particular, we may request, as a condition to be offered common stock, that Qualified Investors will each represent, warrant and certify to us and/or to anyone acting on our behalf: (i) that it is an investor falling within one of the categories listed in the First Addendum to the Israeli Securities Law, 5728-1968; (ii) which of the categories listed in the First Addendum to the Israeli Securities Law, 5728-1968 regarding Qualified Investors is applicable to it; (iii) that it will abide by all provisions set forth in the Israeli Securities Law, 5728-1968 and the regulations promulgated thereunder in connection with the offer to be issued common stock; (iv) that the shares of common stock that it will be issued are, subject to exemptions available under the Israeli Securities Law, 5728-1968: (a) for its own account; (b) for investment purposes only; and (c) not issued with a view to resale within the State of Israel, other than in accordance with the provisions of the Israeli Securities Law, 5728-1968; and (v) that it is willing to provide further evidence of its Qualified Investor status. Addressed Investors may have to submit written evidence in respect of their identity and may have to sign and submit a declaration containing, inter alia, the Addressed Investor's name, address and passport number or Israeli identification number.

Legal matters

The validity of the shares of Class A common stock offered hereby will be passed upon for us by Latham & Watkins LLP. Certain legal matters will be passed upon for the underwriters by Goodwin Procter LLP.

Experts

The financial statements as of December 31, 2020 and 2019 and for the years then ended included in this Prospectus have been so included in reliance on the report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

Where you can find more information

We have filed with the Securities and Exchange Commission, or SEC, a registration statement on Form S-1 under the Securities Act with respect to the shares of Class A common stock offered hereby. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement or the exhibits and schedules filed therewith. For further information about us and the Class A common stock offered hereby, we refer you to the registration statement and the exhibits and schedules filed thereto. Statements contained in this prospectus regarding the contents of any contract or any other document that is filed as an exhibit to the registration statement are not necessarily complete, and each such statement is qualified in all respects by reference to the full text of such contract or other document filed as an exhibit to the registration statement.

You may read our SEC filings, including this registration statement, over the Internet at the SEC's website at www.sec.gov. Upon the completion of this offering, we will be subject to the information reporting requirements of the Exchange Act and we will file reports, proxy statements and other information with the SEC. These reports, proxy statements and other information will be available for review at the SEC's website referred to above. We also maintain a website at www.rapidmicrobio.com, at which, following the completion of this offering, you may access these materials free of charge as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC. Information contained on or accessible through our website is not a part of this prospectus or the registration statement of which it forms a part, and the inclusion of our website address in this prospectus is an inactive textual reference only. You should not consider the contents of our website in making an investment decision with respect to our Class A common stock.

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Rapid Micro Biosystems, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Rapid Micro Biosystems, Inc. and its subsidiaries (the "Company") as of December 31, 2020 and 2019, and the related consolidated statements of operations, comprehensive loss, redeemable convertible preferred stock and stockholders' deficit and cash flows for the years then ended, including the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2019, and the results of its operations and its cash flows for the years then ended in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits of these consolidated financial statements in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/PricewaterhouseCoopers LLP
Boston, Massachusetts
March 22, 2021, except for the effects of the revision discussed
in Note 1 to the consolidated financial statements, as to which
the date is May 6, 2021

We have served as the Company's auditor since 2010.

RAPID MICRO BIOSYSTEMS, INC.
Consolidated balance sheets
(In thousands, except share and per share amounts)

	December 31, 2019	December 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	$ 12,459	$ 30,079
Short-term investments	—	14,998
Accounts receivable	3,627	4,988
Inventory	5,752	8,965
Prepaid expenses and other current assets	1,774	3,120
Total current assets	23,612	62,150
Property and equipment, net	7,592	7,052
Other long-term assets	332	695
Restricted cash	152	100
Total assets	$ 31,688	$ 69,997
Liabilities, Redeemable Convertible Preferred Stock and Stockholders' Deficit		
Current liabilities:		
Accounts payable	$ 3,211	$ 4,468
Accrued expenses and other current liabilities	5,436	6,654
Deferred revenue	1,881	4,423
Total current liabilities	10,528	15,545
Preferred stock warrant liability	3,396	4,117
Notes payable, net of unamortized discount	17,806	24,810
Deferred rent, long term	683	705
Total liabilities	32,413	45,177
Commitments and contingencies (Note 16)		
Redeemable convertible preferred stock (Series A1, B1, C1 and C2), $0.01 par value; 83,781,064 shares and 161,455,689 share authorized at December 31, 2019 and 2020, respectively; 78,757,540 shares and 133,021,640 shares issued and outstanding at December 31, 2019 and 2020, respectively; liquidation preference of $204,808 at December 31, 2020	81,850	151,826
Stockholders' equity (deficit):		
Common stock, $0.01 par value; 110,000,000 shares and 175,000,000 shares authorized at December 31, 2019 and 2020, respectively; 1,767,688 shares and 3,064,626 shares issued and outstanding at December 31, 2019 and 2020, respectively	18	31
Additional paid-in capital	121,917	114,550
Accumulated deficit	(204,510)	(241,588)
Accumulated other comprehensive income	—	1
Total stockholders' deficit	(82,575)	(127,006)
Total liabilities, redeemable convertible preferred stock and stockholders' deficit	$ 31,688	$ 69,997

The accompanying notes are an integral part of these consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.
Consolidated statements of operations
(In thousands, except share and per share amounts)

	Year ended December 31,	
	2019	2020
Revenue:		
Product revenue	$ 9,328	$ 10,992
Service revenue	2,128	3,091
Non-commercial revenue	5,056	1,994
Total revenue	16,512	16,077
Costs and operating expenses:		
Cost of product revenue	10,627	18,642
Cost of service revenue	3,021	3,386
Cost of non-commercial revenue	3,098	2,120
Research and development	5,429	6,531
Sales and marketing	4,047	5,962
General and administrative	8,924	9,976
Total costs and operating expenses	35,146	46,617
Loss from operations	(18,634)	(30,540)
Other income (expense):		
Interest expense	(2,375)	(3,447)
Change in fair value of preferred stock warrant liability	249	(69)
Loss on extinguishment of debt	—	(2,910)
Other income	16	22
Total other income (expense), net	(2,110)	(6,404)
Loss before income taxes	(20,744)	(36,944)
Income tax expense	427	134
Net loss	(21,171)	(37,078)
Accretion of redeemable convertible preferred stock to redemption value	(2,745)	(3,745)
Cumulative redeemable convertible preferred stock dividends	(2,704)	(4,398)
Net loss attributable to common stockholders — basic and diluted	$ (26,620)	$ (45,221)
Net loss per share attributable to common stockholders — basic and diluted	$ (15.34)	$ (25.22)
Weighted average common shares outstanding — basic and diluted	1,735,253	1,793,272

The accompanying notes are an integral part of these consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.
Consolidated statements of comprehensive loss
(In thousands)

	Year ended December 31,	
	2019	2020
Net loss	$ (21,171)	$ (37,078)
Other comprehensive income:		
Unrealized gain on short-term investments, net of tax	—	1
Comprehensive loss	$ (21,171)	$ (37,077)

The accompanying notes are an integral part of these consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.
Consolidated statements of redeemable convertible preferred stock and stockholders' deficit
(In thousands, except share amounts)

	Redeemable convertible preferred stock		Common stock		Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive income	Total stockholders' deficit
	Shares	Amount	Shares	Amount				
Balances at December 31, 2018	63,882,540	$ 61,542	1,716,126	$ 17	$ 126,883	$ (183,451)	$ —	$ (56,551)
Issuance of Series B1 redeemable convertible preferred stock, net of issuance costs of $16	14,875,000	14,859	—	—	—	—	—	—
Issuance of common stock upon exercise of stock options	—	—	51,562	1	10	—	—	11
Accretion of redeemable convertible preferred stock to redemption value	—	2,745	—	—	(2,745)	—	—	(2,745)
Cumulative redeemable convertible preferred stock dividends	—	2,704	—	—	(2,704)	—	—	(2,704)
ASC 606 cumulative-effect adjustment	—	—	—	—	—	112	—	112
Stock-based compensation expense	—	—	—	—	473	—	—	473
Net loss	—	—	—	—	—	(21,171)	—	(21,171)
Balances at December 31, 2019	78,757,540	81,850	1,767,688	18	121,917	(204,510)	—	(82,575)
Issuance of Series C1 redeemable convertible preferred stock, net of issuance costs of $261	23,611,208	26,891	—	—	—	—	—	—
Issuance of Series C2 redeemable convertible preferred stock, net of issuance costs of $303	20,301,829	23,044	—	—	—	—	—	—
Conversion of bridge notes to C1 redeemable convertible preferred stock	10,351,063	11,898	—	—	—	—	—	—
Accretion of redeemable convertible preferred stock to redemption value	—	3,745	—	—	(3,745)	—	—	(3.745)
Cumulative redeemable convertible preferred stock dividends	—	4,398	—	—	(4,398)	—	—	(4,398)
Issuance of common stock upon exercise of stock options	—	—	1,296,938	13	243	—	—	256
Stock-based compensation expense	—	—	—	—	533	—	—	533
Net loss	—	—	—	—	—	(37,078)	—	(37,078)
Other comprehensive income	—	—	—	—	—	—	1	1
Balances at December 31, 2020	133,021,640	$ 151,826	3,064,626	$ 31	$ 114,550	$ (241,588)	$ 1	$ (127,006)

The accompanying notes are an integral part of these consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.
Consolidated statements of cash flows
(In thousands)

	Year ended December 31,	
	2019	2020
Cash flows from operating activities:		
Net loss	$ (21,171)	$ (37,078)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization expense	1,460	1,509
Stock-based compensation expense	473	533
Change in fair value of preferred stock warrant liability	(249)	69
Provision recorded for inventory	—	154
Noncash interest expense	467	2,023
Loss on extinguishment of debt	—	2,910
Other, net	(18)	(17)
Changes in operating assets and liabilities		
Accounts receivable	(511)	(1,361)
Inventory	(3,924)	(3,367)
Prepaid expenses and other current assets	(1,316)	(1,325)
Other long-term assets	(332)	(363)
Accounts payable	1,035	978
Accrued expenses and other current liabilities	1,039	1,775
Deferred revenue	1,395	2,542
Deferred rent, long term	505	22
Net cash used in operating activities	(21,147)	(30,996)
Cash flows from investing activities:		
Purchases of property and equipment	(1,695)	(690)
Purchases of short-term investments	—	(24,980)
Maturity of investments	—	10,000
Net cash used in investing activities	(1,695)	(15,670)
Cash flows from financing activities:		
Proceeds from issuance of redeemable convertible preferred stock, net of issuance costs	14,859	49,935
Proceeds from issuance of common stock upon option exercise	11	72
Proceeds from issuance of convertible notes	—	9,500
Proceeds from issuance of notes payable	—	25,000
Payments of debt issuance costs	—	(875)
Repayment of term loans	—	(18,000)
Payment of debt extinguishment fees	—	(1,398)
Net cash provided by financing activities	14,870	64,234
Net increase (decrease) in cash, cash equivalents and restricted cash	(7,972)	17,568
Cash, cash equivalents and restricted cash at beginning of period	20,583	12,611
Cash, cash equivalents and restricted cash at end of period	$ 12,611	$ 30,179

The accompanying notes are an integral part of these consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.
Consolidated statements of cash flows
(In thousands)

	Year ended December 31,	
	2019	2020
Supplemental disclosure of cash flow information		
Cash paid for interest	$1,910	$1,977
Supplemental disclosure of non-cash investing activities		
Purchases of property and equipment in accounts payable	$ —	$ 279
Supplemental disclosure of non-cash financing activities		
Conversion of convertible notes to Series C1 preferred stock	$ —	$9,523
Issuance of preferred stock warrants in connection with redeemable convertible preferred stock	$ —	$ 652
Issuance of common stock in connection with stock option exercises not settled	$ —	$ 184
Initial fair value of derivative liability	$ —	$2,375
Deferred offering costs included in accounts payable and accrued expenses	$ —	$ 62
Accretion of redeemable convertible preferred stock to redemption value	$2,745	$3,745
Cumulative redeemable convertible preferred stock dividends	$2,704	$4,398

The accompanying notes are an integral part of these consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.
Notes to consolidated financial statements
(Amounts in thousands, except share and per share amounts)

1. Nature of the business and basis of presentation

Rapid Micro Biosystems, Inc. (the “Company”) was incorporated under the laws of the State of Delaware on December 29, 2006. The Company develops, manufactures, markets and sells Growth Direct systems (“Systems”) proprietary consumables, laboratory information management system (“LIMS”) connection software, and services to address rapid microbial analysis used for quality control in the manufacture of pharmaceuticals, medical devices and personal care products. The Company’s technology uses a highly sensitive camera and the natural auto fluorescence of living cells to identify and quantify microbial growth faster and more accurately than the traditional method, which relies on the human eye. The Company currently sells to customers in North America, Europe and Asia. The Company is headquartered in Lowell, Massachusetts.

The Company is subject to risks and uncertainties common to companies in the pharmaceutical and biotech quality control laboratory testing and instrumentation industry including, but not limited to, the successful development, commercialization, marketing and sale of products, fluctuations in operating results and financial risks, protection of proprietary knowledge and patent risks, dependence on key personnel, competition, technological and medical risks, customer demand, compliance with governmental regulations and management of growth. Potential risks and uncertainties also include, without limitation, uncertainties regarding the duration and magnitude of the impact of the COVID-19 pandemic on the Company’s business and the economy in general. Products currently under development will require additional research and development efforts prior to commercialization and will require additional capital and adequate personnel and infrastructure. The Company’s research and development may not be successfully completed, adequate protection for the Company’s technology may not be obtained, the Company may not obtain necessary government regulatory approval, and approved products may not prove commercially viable. The Company operates in an environment of rapid change in technology and competition.

In March 2020, the World Health Organization declared the global novel coronavirus disease 2019 (“COVID-19”) outbreak a pandemic. The impact of this pandemic has been and will likely continue to be extensive in many aspects of society, which has resulted in and will likely continue to result in significant disruptions to the global economy, as well as businesses and capital markets around the world. The Company cannot at this time predict the ultimate extent, duration, or full impact that the COVID-19 pandemic will have on its future financial condition and operations. The impact of the COVID-19 coronavirus outbreak on the Company’s financial performance will depend on future developments, including the duration and spread of the pandemic and related governmental advisories and restrictions. These developments and the impact of COVID-19 on the financial markets and the overall economy are highly uncertain and cannot be predicted. If the financial markets and/or the overall economy are impacted for an extended period, the Company’s results may be materially adversely affected.

Future impacts to the Company’s business as a result of COVID-19 could include disruptions to the Company’s manufacturing operations and supply chain caused by facility closures, reductions in operating hours, staggered shifts and other social distancing efforts; labor shortages; decreased productivity and unavailability of materials or components; limitations on its employees’ and customers’ ability to travel, and delays in shipments to and from affected countries and within the United States. While the Company maintains an inventory of finished products and raw materials used in its products, a prolonged pandemic could lead to shortages in the raw materials necessary to manufacture its products.

Basis of presentation

The consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America (“GAAP”) and include the accounts of the Company and its wholly owned subsidiaries in Germany and Switzerland. All intercompany accounts and transactions have been eliminated in

consolidation. Any reference in these notes to applicable guidance is meant to refer to the authoritative GAAP as found in the Accounting Standards Codification ("ASC") and Accounting Standards Update ("ASU") of the Financial Accounting Standards Board ("FASB").

Revision of prior period financial statements

During the three months ended March 31, 2021, an error was identified by the Company related to the accretion of redeemable convertible preferred stock in prior periods. Specifically, the Company had understated the annual accretion of the Series B1, C1 and C2 redeemable convertible preferred stock for the years ended December 31, 2019 and 2020 and prior periods, which resulted in an understatement of the carrying value of the redeemable convertible preferred stock, net loss attributable to common stockholders and net loss per share attributable to common stockholders. The Company concluded that the impacts of the error were not material to the consolidated financial statements for the years ended December 31, 2019 and 2020. While not material, the Company has elected to revise the previously issued consolidated financial statements for the years ended December 31, 2019 and 2020 for the impacts of the error. In addition, the applicable notes to the accompanying financial statements have also been revised to correct for these misstatements.

The following table reflects the impacts of the error on the consolidated financial statements (in thousands except per share amounts):

Revisions to consolidated balance sheets and consolidated statements of redeemable convertible preferred stock and stockholders' deficit:

	As of December 31, 2018			As of December 31, 2019			As of December 31, 2020		
	As previously reported	Adjustment	As revised	As previously reported	Adjustment	As revised	As previously reported	Adjustment	As revised
Redeemable convertible preferred stock	$ 60,342	$ 1,200	$ 61,542	$ 78,862	$ 2,988	$ 81,850	$ 146,155	$ 5,671	$ 151,826
Additional paid-in capital	$ 128,083	$ (1,200)	$ 126,883	$ 124,905	$ (2,988)	$ 121,917	$ 120,221	$ (5,671)	$ 114,550
Total stockholders' deficit	$ (55,351)	$ (1,200)	$ (56,551)	$ (79,587)	$ (2,988)	$ (82,575)	$ (121,335)	$ (5,671)	$ (127,006)

Revisions to consolidated statements of operations:

	For the year ended December 31, 2019			For the year ended December 31, 2020		
	As previously reported	Adjustment	As revised	As previously reported	Adjustment	As revised
Accretion of redeemable convertible preferred stock to redemption value	$ (957)	$ (1,788)	$ (2,745)	$ (1,062)	$ (2,683)	$ (3,745)
Net loss attributable to common stockholders — basic and diluted	$ (24,832)	$ (1,788)	$ (26,620)	$ (42,538)	$ (2,683)	$ (45,221)
Net loss per share attributable to common stockholders — basic and diluted	$ (14.31)	$ (1.03)	$ (15.34)	$ (23.72)	$ (1.50)	$ (25.22)

Revisions to consolidated statements of cash flows:

	For the year ended December 31, 2019			For the year ended December 31, 2020		
	As previously reported	Adjustment	As revised	As previously reported	Adjustment	As revised
Supplemental disclosure of non-cash financing activities:						
Accretion of redeemable convertible preferred stock to redemption value	$ 957	$ 1,788	$ 2,745	$ 1,062	$ 2,683	$ 3,745

Going concern

The Company has evaluated whether there are certain conditions and events, considered in the aggregate, that raise substantial doubt about the Company's ability to continue as a going concern within one year after the date that the consolidated financial statements are issued.

Through December 31, 2020, the Company has funded its operations primarily with proceeds from product, service and non-commercial revenue, proceeds from sales of its redeemable convertible preferred stock, including borrowings under convertible debt arrangements that subsequently converted into redeemable convertible preferred stock, and proceeds from the issuance of term loans. The Company has incurred recurring losses since its inception, including net losses of $21.2 million and $37.1 million for the years ended December 31, 2019 and 2020, respectively. As of December 31, 2020, the Company had an accumulated deficit of $241.6 million. The Company expects to continue to generate significant operating losses for the foreseeable future. As of March 22, 2021, the date these consolidated financial statements were available for issuance, the Company expects that its existing cash and cash equivalents, and short-term investments, including $81.0 million raised in a Series D1 and D2 Preferred Stock financing completed in March 2021, will be sufficient to fund its operating expenses and capital expenditure requirements for at least twelve months following the date these consolidated financial statements were available to be issued. The future viability of the Company beyond that point is dependent on its ability to raise additional capital to finance its operations.

The Company is seeking to complete an initial public offering (“IPO”) of its common stock. In the event the Company does not complete an IPO, the Company expects to seek additional funding through private equity financing, debt financing, or other capital sources, including government funding arrangements or other strategic transactions. The Company may not be able to obtain financing on acceptable terms, or at all, and the terms of any financing may adversely affect the holdings or the rights of the Company’s stockholders.

If the Company is unable to obtain funding, the Company will be required to delay, reduce or eliminate some or all of its research and development programs, product expansion or commercialization efforts, or the Company may be unable to continue operations. Although management continues to pursue these financing plans, there is no assurance that the Company will be successful in obtaining sufficient funding on terms acceptable to the Company to fund continuing operations, if at all.

The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty. Accordingly, the consolidated financial statements have been prepared on a basis that assumes the Company will continue as a going concern and which contemplates the realization of assets and satisfaction of liabilities and commitments in the ordinary course of business.

2. Summary of significant accounting policies

Use of estimates

The preparation of the Company’s consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the consolidated financial statements, and the reported amounts of revenue and expenses during the reporting periods. Significant estimates and assumptions reflected in these consolidated financial statements include, but are not limited to, calculating the standalone selling price for revenue recognition, the valuation of inventory, the valuation of common stock and stock-based awards, and the valuation of the preferred stock warrant liability. The Company bases its estimates on historical experience, known trends and other market-specific and relevant factors that it believes to be reasonable under the circumstances. On an ongoing basis, management evaluates its estimates when there are changes in circumstances, facts and experience. Changes in estimates are recorded in the period in which they become known. Actual results could differ from those estimates.

Due to the COVID-19 pandemic, there has been uncertainty and disruption in the global economy and financial markets. The Company is not aware of any specific event or circumstance that would require an update to its estimates or judgments or a revision of the carrying value of its assets or liabilities as of March 22, 2021, the date the consolidated financial statements were available to be issued. These estimates may change as new events occur and additional information is obtained.

Risk of concentrations of credit, significant customers and significant suppliers

Financial instruments that potentially expose the Company to concentrations of credit risk consist primarily of cash and cash equivalents, short-term investments and accounts receivable. Periodically, the Company maintains deposits in accredited financial institutions in excess of federally insured limits. The Company maintains its cash and cash equivalents with financial institutions that management believes to be of high credit quality. The Company has not experienced any losses on such accounts and does not believe it is exposed to any unusual credit risk beyond the normal credit risk associated with commercial banking relationships. The Company has not experienced any other-than-temporary losses with respect to its cash equivalents and investments and does not believe that it is subject to unusual credit risk beyond the normal credit risk associated with commercial banking relationships.

Significant customers are those which represent more than 10% of the Company's total revenue or accounts receivable balance at each respective balance sheet date. The following table presents customers that represent 10% or more of the Company's total revenue:

	Year ended December 31,	
	2019	2020
Customer A	30.6%	12.4%
Customer B	15.2%	*
Customer C	*	10.5%
Customer D	*	23.2%
	45.8%	46.1%

* – less than 10%

The following table presents customers that represent 10% or more of the Company's accounts receivable:

	December 31,	
	2019	2020
Customer D	*	41.9%
Customer E	31.9%	10.1%
Customer F	22.7%	*
Customer G	13.6%	*
Customer H	12.9%	*
Customer I	*	18.7%
Customer J	*	13.4%
	81.1%	84.1%

* – less than 10%

The Company relies on third parties for the supply and manufacture of its products as well as third-party logistics providers. In instances where these parties fail to perform their obligations, the Company may be unable to find alternative suppliers to satisfactorily deliver its products to its customers on time, if at all, which could have a material adverse effect on the Company's operating results, financial condition and cash flows and damage its customer relationships. There are no significant concentrations around a single third-party supplier or manufacturer for the year ended December 31, 2019 or 2020.

Deferred offering costs

The Company capitalizes certain legal, accounting and other third-party fees that are directly associated with in-process equity financings as deferred offering costs until such financings are consummated. After consummation of an equity financing, these costs are recorded in stockholders' equity (deficit) as a reduction of additional paid-in capital generated as a result of the offering or as a reduction to the carrying value of redeemable convertible preferred stock. If the in-process equity financing is abandoned, the deferred offering costs will be expensed

immediately as a charge to operating expenses in the consolidated statements of operations. As of December 31, 2019 and 2020, the Company had zero and $0.1 million, respectively, in deferred offering costs in the consolidated balance sheets.

Debt issuance costs

The Company capitalizes certain legal and other third-party fees that are directly associated with the issuance of debt as debt issuance costs. Debt issuance costs are recorded as a direct reduction of the carrying amount of the associated debt on the consolidated balance sheets and amortized as interest expense on the consolidated statement of operations using the effective interest method, which approximates straight-line method. As of December 31, 2019 and 2020, debt issuance costs totaled $0.2 million and $1.3 million, respectively. During the year ended December 31, 2019 and 2020, the Company recorded $0.5 million and $0.9 million, respectively in amortization of the debt issuance costs recorded within interest expense in the consolidated statement of operations.

Cash equivalents

The Company considers all highly liquid investments with an original maturity of 90 days or less at the time of purchase to be cash equivalents. Cash equivalents that are readily convertible to cash are stated at cost, which approximates fair value. At both December 31, 2019 and 2020, the Company held cash of $0.1 million in banks located outside of the U.S.

Restricted cash

As of December 31, 2019 and 2020, the Company was required to maintain guaranteed investment certificates of $0.2 million and $0.1 million, respectively, with maturities of three months to one year that are subject to an insignificant risk of changes in value. The guaranteed investment certificates are held for the benefit of the landlord in connection with an operating lease which has a remaining term of greater than one year and are classified as restricted cash (non-current) on the Company's consolidated balance sheets.

Short-term investments

The Company's short-term investments are classified as available-for-sale and recorded at fair value based upon market prices at period end. Unrealized gains and losses are recorded in accumulated other comprehensive income as a separate component of stockholders' deficit. Realized gains and losses and declines in value of investments determined to be other than temporary are included as a component of interest income in the consolidated statements of operations. The costs of investments for purposes of computing realized and unrealized gains and losses is based on the specific identification method.

The Company evaluates its short-term investments with unrealized losses for other-than-temporary impairment. When assessing short-term investments for other-than-temporary declines in value, the Company considers such factors as, among other things, how significant the decline in value is as a percentage of the original cost, how long the market value of the investment has been less than its original cost, the Company's ability and intent to retain the short-term investment for a period of time sufficient to allow for any anticipated recovery in fair value and market conditions in general. If any adjustment to fair value reflects a decline in the value of the short-term investment that the Company considers to be other-than-temporary, the Company reduces the short-term investment to fair value through a charge to the consolidated statements of operations. No such adjustments were necessary during the periods presented.

The Company's short-term investments as of December 31, 2020 had maturities of less than one year.

Accounts receivable

Accounts receivables are customer obligations that are unconditional. Accounts receivables are presented net of an allowance for doubtful accounts, which represents an estimate of amounts that may not be collectible. The Company performs ongoing credit evaluations of its customers and, if necessary, provides an allowance for

doubtful accounts and expected losses. The Company writes off accounts receivable against the allowance when it determines a balance is uncollectible and no longer actively pursues collection of the receivable. The Company does not have any off-balance-sheet credit exposure related to customers. As of December 31, 2019 and 2020, the Company did not record an allowance for doubtful accounts.

Inventory

Inventory is valued at the lower of cost or net realizable value. Cost is computed using the first-in, first-out method. The Company regularly reviews inventory quantities on-hand for excess and obsolete inventory and, when circumstances indicate, records charges to write down inventories to their estimated net realizable value, after evaluating historical sales, future demand, market conditions and expected product life cycles. Such charges are classified as cost of product revenue in the statements of operations. Any write-down of inventory to net realizable value creates a new cost basis.

Property and equipment

Property and equipment are stated at cost less accumulated depreciation and amortization. Depreciation and amortization expense is recognized using the straight-line method over the estimated useful life of each asset, as follows:

	Estimated Useful Life
Manufacturing and laboratory equipment	5-10 years
Computer hardware and software	3 years
Office furniture and fixtures	5-7 years
Leasehold improvements	Shorter of remaining life of lease or useful life

Estimated useful lives are periodically assessed to determine if changes are appropriate. Maintenance and repairs are charged to expense as incurred. When assets are retired or otherwise disposed of, the cost of these assets and related accumulated depreciation or amortization are eliminated from the consolidated balance sheet and any resulting gains or losses are included in the consolidated statement of operations in the period of disposal. Costs for capital assets not yet placed into service are capitalized as construction-in-progress and depreciated once placed into service.

Impairment of long-lived assets

Long-lived assets consist of property and equipment. Long-lived assets to be held and used are tested for recoverability whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable. Factors that the Company considers in deciding when to perform an impairment review include significant underperformance of the business in relation to expectations, significant negative industry or economic trends and significant changes or planned changes in the use of the assets. If an impairment review is performed to evaluate a long-lived asset group for recoverability, the Company compares forecasts of undiscounted cash flows expected to result from the use and eventual disposition of the long-lived asset group to its carrying value. An impairment loss would be recognized in loss from operations when estimated undiscounted future cash flows expected to result from the use of an asset group are less than its carrying amount. The impairment loss is based on the excess of the carrying value of the impaired asset group over its fair value, determined based on discounted cash flows. The Company did not record any impairment losses on long-lived assets during the years ended December 31, 2019 or 2020.

Fair value measurements

Certain assets and liabilities of the Company are carried at fair value under GAAP. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on

the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. Financial assets and liabilities carried at fair value are to be classified and disclosed in one of the following three levels of the fair value hierarchy, of which the first two are considered observable and the last is considered unobservable:

- Level 1—Quoted prices in active markets for identical assets or liabilities.
- Level 2—Observable inputs (other than Level 1 quoted prices), such as quoted prices in active markets for similar assets or liabilities, quoted prices in markets that are not active for identical or similar assets or liabilities, or other inputs that are observable or can be corroborated by observable market data.
- Level 3—Unobservable inputs that are supported by little or no market activity that are significant to determining the fair value of the assets or liabilities, including pricing models, discounted cash flow methodologies and similar techniques.

The Company's cash equivalents, short-term investments, derivative liability and its redeemable convertible preferred stock warrant liability are carried at fair value, determined according to the fair value hierarchy described above (see Note 3). The carrying values of the Company's accounts receivable, prepaid expenses and other current assets, accounts payable and accrued expenses and other current liabilities approximate their fair values due to the short-term nature of these assets and liabilities. The carrying value of the Company's long-term debt approximates its fair value (a level 2 measurement) at each balance sheet date due to its variable interest rate, which approximates a market interest rate.

Product warranties

The Company offers a one-year limited assurance warranty on System sales, which is included in the selling price. Product warranties provide assurance that the Company's product functions in accordance with agreed specifications. Warranties cover for repairs and replacements when the product does not function in accordance with agreed specifications. The standard assurance warranty does not cover, and no warranty is provided for, parts which by their nature are normally required to be replaced periodically. The accrued warranty cost is based on estimated material, labor and other costs that the Company expects to incur to fulfill the warranty obligation. Estimates are primarily based on historical information, current cost data and future forecast. The Company periodically assesses the adequacy of the warranty accrual and adjusts the amount as necessary. If the historical data used to calculate the adequacy of the warranty accrual are not indicative of future requirements, additional or reduced warranty accrual may be required. The warranty accrual is included in accrued expenses and other current liabilities in the consolidated balance sheets. The following table presents a summary of changes in the amount reserved for warranty cost (in thousands):

	Year ended December 31,	
	2019	2020
Balance, beginning of the year	$ 890	$ 848
Warranty provisions	41	14
Warranty repairs	(83)	(225)
Balance, end of the year	$ 848	$ 637

Classification and accretion of redeemable convertible preferred stock

The Company has classified redeemable convertible preferred stock outside of stockholders' deficit because the shares contain certain redemption features that are not solely within the control of the Company. Costs incurred in connection with the issuance of each series of redeemable convertible preferred stock are recorded as a reduction of gross proceeds from issuance. The Company records periodic accretion to the carrying values of its outstanding redeemable convertible preferred stock such that the carrying value of the redeemable convertible preferred stock will be equal to the redemption value at the earliest date of redemption. Adjustments to the carrying values of the redeemable convertible preferred stock to record this accretion at each reporting date are

considered deemed dividends, which adjust retained earnings (or in the absence of retained earnings, additional paid-in capital) and increases or decreases net loss attributable to common stockholders in computing basic and diluted earnings per share.

Preferred stock warrant liability

The Company classifies warrants for the purchase of shares of its redeemable convertible preferred stock (see Notes 3 and 10) as a liability on its consolidated balance sheets as these warrants are freestanding financial instruments that may require the Company to transfer assets upon exercise. The warrant liability is initially recorded at fair value on the issuance date of each warrant and is subsequently remeasured to fair value at each reporting date using the Black-Scholes pricing model. Changes in the fair value of the warrant liability are recognized as a component of other income (expense) in the consolidated statements of operations. Changes in the fair value of the preferred stock warrant liability will continue to be recognized until the warrants are exercised, expire or qualify for equity classification.

Derivative liability

In February 2020, the Company issued convertible notes to several investors (see Note 9) that provided a conversion option whereby upon the closing of a specified financing event the notes would automatically convert into shares of the same class and series of capital stock of the Company issued to other investors in the financing at a conversion price equal to 80% of the price per share of the securities paid by the other investors. This conversion option was determined to be an embedded derivative that required to be bifurcated and accounted for separately from the notes. The derivative liability was initially recorded at fair value upon entering into the agreement. In April 2020, the specified financing event was consummated, as such the notes were converted into shares of Series C1 Preferred Stock (see Note 10), and the derivative liability was extinguished.

Segment information

The Company determined its operating segment after considering the Company's organizational structure and the information regularly reviewed and evaluated by the Company's chief operating decision maker ("CODM") in deciding how to allocate resources and assess performance. The Company has determined that its CODM is its Chief Executive Officer. The CODM reviews the financial information on a consolidated basis for purposes of evaluating financial performance and allocating resources. On the basis of these factors, the Company determined that it operates and manages its business as one operating segment, that develops, manufactures, markets and sells Systems and related LIMS connection software, consumables and services; and accordingly has one reportable segment for financial reporting purposes. Substantially, all of the Company's long-lived assets are held in the United States.

Revenue recognition

Effective January 1, 2019, the Company adopted ASC 606, *Revenue from Contracts with Customers* ("ASC 606"), using the modified retrospective approach. The adoption of this guidance had an immaterial impact on the Company's financial statements.

Under ASC 606, revenue is recognized when a customer obtains control of promised goods or services, in an amount that reflects the consideration which the entity expects to receive in exchange for those goods or services. In order to achieve this core principle, the Company applies the following five steps when recording revenue: (1) identify the contract, or contracts, with the customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to the performance obligations in the contract and (5) recognize revenue when, or as, performance obligations are satisfied.

The Company derives revenue from the sale of its products and services through direct sale representatives. The Company's arrangements are generally noncancelable and nonrefundable after ownership passes to the customer.

Product revenue

The Company derives product revenue primarily from the sale of its Systems, optional LIMS connection software, which facilitates the transfer of data captured by the System to the customer's existing LIMS software, and proprietary consumables. Revenue is recognized when control of the products is transferred to the customer. Transfer of control is generally at shipment or delivery, depending on contractual terms, and occurs when title and risk of loss transfers to the customer, which represents the point in time when the customer obtains the use of and substantially all of the benefits of the product. Upon delivery, the System is fully functional for use by the customer. As such, the Company's performance obligation related to product sales is satisfied at a point in time.

The Company's principal terms of sale are free carrier ("FCA") shipping point. Occasionally, when customer acceptance of the product is required and is other than perfunctory, revenue for the entire customer arrangement is deferred until the acceptance has been received.

Service revenue

The Company derives service revenue primarily from validation services, service contracts and field service (including installation). The Company's validation services include validation and documentation services performed utilizing Systems purchased by the customer. Service contracts are around the clock maintenance support which can be purchased by the customer after the expiration of the one-year assurance warranty included with each System purchase. Field service revenue primarily consists of services provided by field service engineers to install the System at the customer site and two preventative maintenance services performed during the warranty period. Service revenue is recognized over time using an input method based on time lapsed for service contracts and output method based on milestone achieved for validation services and field service.

Performance obligations

A performance obligation is a promise in a contract to transfer a distinct product or service to a customer that are both capable of being distinct, whereby the customer can benefit from the product or service either on its own or together with other resources that are readily available, and are distinct in the context of the contract, whereby the transfer of the product or service is separately identifiable from other promises in the contract. The Company's main performance obligations in customer arrangements are Systems, LIMS connection software, consumables, validation services, service contracts, and field service.

Payment terms

Payment terms for customer orders are typically between 30 to 90 days after the shipment or delivery of the product. For certain products, services and customer types, the Company requires payment before the products or services are delivered to, or performed for, the customer. None of the Company's contracts contain a significant financing component.

Multiple performance obligations with an arrangement

The Company's contracts may include multiple performance obligations when customers purchase a combination of products and services such as System sold together with the LIMS connection software, consumables or services. For these arrangements, the Company allocates the contract's transaction price to each performance obligation on a relative standalone selling price basis using the Company's best estimate of the standalone selling price of each distinct product or service in the contract. The primary methods used to estimate standalone selling prices are based on the prices observed in standalone sales to customers or cost-plus margin depending on the nature of the obligation and available evidence of fair value. Allocation of the transaction price is determined at contract's inception.

Remaining performance obligations

The Company does not disclose the value of remaining performance obligations for (i) contracts with an original contract term of one year or less, (ii) contracts for which the Company recognizes revenue at the amount to which

it has the right to invoice when that amount corresponds directly with the value of services performed, and (iii) variable consideration allocated entirely to a wholly unsatisfied performance obligation or to a wholly unsatisfied distinct service that forms part of a single performance obligation. The Company does not have material remaining performance obligations associated with contracts with terms greater than one year.

Contract balances from contracts with customers

Contract assets arise from unbilled amounts in customer arrangements when revenue recognized exceeds the amount billed to the customer and the Company's right to payment is conditional and not only subject to the passage of time. The Company had $0.8 million and $0.5 million in contract assets as of December 31, 2019 and 2020, respectively, included in prepaid expenses and other current assets. These balances relate to BARDA agreement.

Contract liabilities represent the Company's obligation to transfer goods or services to a customer for which it has received consideration (or the amount is due) from the customer. The Company has a contract liability related to service revenue, which consists of amounts that have been invoiced but that have not been recognized as revenue. Amounts expected to be recognized as revenue within 12 months of the balance sheet date are classified as current deferred revenue and amounts expected to be recognized as revenue beyond 12 months of the balance sheet date are classified as noncurrent deferred revenue. The Company did not record any non-current deferred revenue as of December 31, 2019 or 2020. Deferred revenue was $1.9 million and $4.4 million at December 31, 2019 and 2020, respectively. Revenue recognized during the year ended December 31, 2019 that was included in deferred revenue at the prior year end was $0.6 million. Revenue recognized during the year ended December 31, 2020, that was included in deferred revenue at the prior year end was $1.0 million.

Non-commercial revenue

The Company generates revenue from a long-term contract with the U.S. Department of Health and Human Services Biomedical Advanced Research and Development Authority ("BARDA") a part of the U.S. government. The Company's contracts with the U.S. government typically are subject to the Federal Acquisition Regulation ("FAR") and are priced based on estimated or actual costs of producing goods or providing services. The FAR provides guidance on the types of costs that are allowable in establishing prices for goods or services provided under U.S. government contracts. In September 2017, the Company signed a contract with BARDA, which was subsequently modified on multiple occasions to increase the contract value and reduce the cost share reimbursement rate. Modifications were accounted for prospectively. The contract is a cost-reimbursable, cost-sharing arrangement, whereby BARDA reimburses the Company for a percentage of the total costs that have been incurred including indirect allowable costs. Revenue on the BARDA contract is recognized over time using an input method based on cost incurred to date in relation to total estimated cost. Due to the structure of the arrangement, the transaction price is variable in nature based on actual cost incurred. As such the amount included in the transaction price is constrained to the amount for which it is probable that a significant reversal of cumulative revenue recognized will not occur.

Disaggregated revenue

The Company disaggregates revenue based on the recurring and non-recurring, and commercial and non-commercial, nature of the underlying sale. Recurring revenue includes sales of consumables and service contracts. Non-recurring revenue includes sales of Systems, LIMS connection software, validation services, field

service, and revenue under the Company's contract with BARDA. The following table presents the Company's revenue by the recurring or non-recurring and commercial or non-commercial nature of the revenue stream (in thousands):

	Year ended December 31,	
	2019	2020
Product and service revenue — recurring	$ 2,294	$ 3,908
Product and service revenue — non-recurring	9,162	10,175
Non-commercial revenue — non-recurring	5,056	1,994
Total revenue	$ 16,512	$ 16,077

The following table presents the Company's revenue by customer geography (in thousands):

	Year ended December 31,	
	2019	2020
United States	$ 11,708	$ 7,304
Germany	2,041	1,920
Switzerland	1,622	4,111
All other countries	1,141	2,742
Total revenue	$ 16,512	$ 16,077

Contract acquisition costs

The Company incurs and pays commissions on Systems, LIMS connection software, validation services, and field service arrangements. The period of the related revenue stream is typically less than one year in duration, and as such, the Company applies the practical expedient to expense the costs in the period in which they were incurred. The Company does not pay commissions on non-commercial revenue with BARDA, service contracts or consumables.

Shipping and handling fees

Shipping and handling fees billed to customers for product shipments are recorded in product revenue in the consolidated statements of operations. Shipping and handling costs incurred for inventory purchases and product shipments are recorded in cost of product revenue in the consolidated statements of operations.

Cost of revenue

Cost of product revenue primarily consists of costs for raw material parts and associated freight, shipping and handling costs, royalties, contract manufacturer costs, salaries and other personnel costs including stock-based compensation expense, depreciation and amortization expense, scrap, warranty cost, inventory reserves, allocated information technology and facility-related costs, overhead and other costs related to those sales recognized as product revenue in the period. Cost of service revenue primarily consists of salaries and other personnel costs including stock-based compensation expense, travel costs, materials consumed when performing installations, validations and other services, allocated information technology and facility related costs associated with training and other expenses related to service revenue recognized in the period. Cost of non-commercial revenue primarily consists of salaries and other personnel costs including stock-based compensation expense, consulting expense, materials, travel and other costs related to revenue recognized as non-commercial revenue during the period.

Research and development costs

Research and development costs are expensed as incurred. Research and development expenses consist of costs incurred in performing research and development activities including, employee-related expenses, such as

salaries, bonuses and other personnel costs including stock-based compensation expense, the cost of developing maintaining and improving new and existing products designs, the cost of hardware and software engineering, the cost of research materials and supplies, external costs of outside consultants engaged to conduct research and development services associated with the Company's technology and products, and information technology and facilities expenses, which include direct and allocated expenses for rent, maintenance of facilities and insurance, as well as related depreciation and amortization. The costs incurred for the development of system software that will be sold are capitalized when technological feasibility has been established. The Company has continued to develop the software associated with its platform and products, and the associated costs have been expensed as incurred, as the nature of improvements did not significantly improve the performance or functionality of the software.

Advertising costs

Advertising costs are expensed as incurred and are included in sales and marketing expenses in the consolidated statements of operations. Advertising costs were $0.1 million during each of the years ended December 31, 2019 and 2020.

Patent costs

All patent-related costs incurred in connection with filing and prosecuting patent applications are expensed as incurred due to the uncertainty about the recovery of the expenditures. Amounts incurred are classified within general and administrative expense in the consolidated statement of operations.

Stock-based compensation

The Company measures all stock-based awards granted to employees, officers and directors based on their fair value on the date of the grant and recognizes compensation expense for those awards over the requisite service period, which is generally the vesting period of the respective award. The Company issues stock-based awards with only service-based vesting conditions and records the expense for these awards using the straight-line method. Forfeitures are accounted for as they occur. The Company has not issued any stock-based awards with performance-based vesting conditions.

The Company classifies stock-based compensation expense in its consolidated statement of operations in the same manner in which the award recipient's payroll costs are classified or in which the award recipient's service payments are classified.

The fair value of each stock option grant is estimated on the date of grant using the Black-Scholes option-pricing model, which uses the following inputs: (i) the fair value per share of the common stock issuable upon exercise of the option, (ii) the expected term of the option, (iii) expected volatility of the price of the common stock, (iv) the risk-free interest rate, and (v) the expected dividend yield. The Company values its common stock taking into consideration its most recently available valuation of common stock performed by third parties as well as additional factors which may have changed since the date of the most recent contemporaneous valuation through the date of grant. The exercise price of the option cannot be less than the fair market value of a share of common stock on the date of grant. The expected term of the Company's stock options has been determined utilizing the "simplified" method for awards that qualify as "plain-vanilla". The Company historically has been a private company and lacks company-specific historical and implied volatility information for its stock. Therefore, the Company estimates its expected stock price volatility based on the historical volatility of publicly traded peer companies and expects to continue to do so until such time as it has adequate historical data regarding the volatility of its own traded stock price. The risk-free interest rate is determined by reference to the U.S. Treasury yield curve in effect at the time of grant of the award for time periods approximately equal to the expected term of the award. Expected dividend yield is based on the fact that the Company has never paid cash dividends on its common stock and does not expect to pay any cash dividends in the foreseeable future.

Income taxes

The Company accounts for income taxes using the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been recognized in the consolidated financial statements or in the Company's tax returns. Deferred tax assets and liabilities are determined on the basis of the differences between the consolidated financial statements and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. Changes in deferred tax assets and liabilities are recorded in the provision for income taxes. The Company assesses the likelihood that its deferred tax assets will be recovered from future taxable income and, to the extent it believes, based upon the weight of available evidence, that it is more likely than not that all or a portion of the deferred tax assets will not be realized, a valuation allowance is established through a charge to income tax expense. Potential for recovery of deferred tax assets is evaluated by estimating the future taxable profits expected and considering prudent and feasible tax planning strategies.

The Company accounts for uncertainty in income taxes recognized in the consolidated financial statements by applying a two-step process to determine the amount of tax benefit to be recognized. First, the tax position must be evaluated to determine the likelihood that it will be sustained upon external examination by the taxing authorities. If the tax position is deemed more-likely-than-not to be sustained, the tax position is then assessed to determine the amount of benefit to recognize in the consolidated financial statements. The amount of the benefit that may be recognized is the largest amount that has a greater than 50% likelihood of being realized upon ultimate settlement. The provision for income taxes includes the effects of any resulting tax reserves, or unrecognized tax benefits, that are considered appropriate as well as the related net interest and penalties.

Foreign currency translation and transactions

The Company has determined that the functional and reporting currency for its operations in Germany and Switzerland is the U.S. Dollar. Gains and losses arising from currency exchange rate fluctuations on transactions denominated in a currency other than the local functional currency are included in other income.

Comprehensive loss

Comprehensive loss includes net loss as well as other changes in stockholders' deficit that result from transactions and economic events other than those with stockholders. For the years ended December 31, 2019 and 2020, comprehensive loss included $0 and less than $0.1 million, respectively, of unrealized gains on short-term investments, net of tax.

Net loss per share attributable to common stockholders

The Company follows the two-class method when computing net income (loss) per share as the Company has issued shares that meet the definition of participating securities. The two-class method determines net income (loss) per share for each class of common and participating securities according to dividends declared or accumulated and participation rights in undistributed earnings. The two-class method requires income available to common stockholders for the period to be allocated between common and participating securities based upon their respective rights to receive dividends as if all income for the period had been distributed.

Basic net income (loss) per share attributable to common stockholders is computed by dividing the net income (loss) attributable to common stockholders by the weighted average number of common shares outstanding for the period. Diluted net income (loss) attributable to common stockholders is computed by adjusting net income (loss) attributable to common stockholders to reallocate undistributed earnings based on the potential impact of dilutive securities. Diluted net income (loss) per share attributable to common stockholders is computed by dividing the diluted net income (loss) attributable to common stockholders by the weighted average number of common shares outstanding for the period, including potential dilutive common shares. For purpose of this calculation, outstanding stock options, redeemable convertible preferred stock and warrants to purchase preferred stock are considered potential dilutive common shares.

The Company's redeemable convertible preferred stock contractually entitles the holders of such shares to participate in dividends but does not contractually require the holders of such shares to participate in losses of the Company. Accordingly, in periods in which the Company reports a net loss attributable to common stockholders such losses are not allocated to such participating securities. In periods in which the Company reports a net loss attributable to common stockholders diluted net loss per share attributable to common stockholders is the same as basic net loss per share attributable to common stockholders since dilutive common shares are not assumed to have been issued if their effect is anti-dilutive. The Company reported a net loss attributable to common stockholders for the years ended December 31, 2019 and 2020, as such basic net loss per share attributable to common stockholders was the same as diluted net loss per share attributable to common stockholders.

Recently adopted accounting pronouncements

In November 2016, the FASB issued ASU No. 2016-18, *Statement of Cash Flows (Topic 230)* ("ASU 2016-18"), which requires that amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. For public business entities, ASU 2016-18 is effective for fiscal years beginning after December 15, 2017. For all other entities, the amendments are effective for fiscal years beginning after December 15, 2018, and interim periods within fiscal years beginning after December 15, 2019. The Company adopted ASU 2016-18 as of the required effective date of January 1, 2019. Adoption impacted the presentation of restricted cash and related disclosures in the consolidated statement of cash flows only.

In July 2017, the FASB issued ASU No. 2017-11, *Earnings Per Share (Topic 260), Distinguishing Liabilities from Equity (Topic 480), Derivatives and Hedging (Topic 815) (Part I) Accounting for Certain Financial Instruments with Down Round Features (Part II) Replacement of the Indefinite Deferral for Mandatorily Redeemable Financial Instruments of Certain Nonpublic Entities and Certain Mandatorily Redeemable Noncontrolling Interests with a Scope Exception* ("ASU 2017-11"). Part I applies to entities that issue financial instruments such as warrants, convertible debt or convertible preferred stock that contain down-round features. Part II replaces the indefinite deferral for certain mandatorily redeemable noncontrolling interests and mandatorily redeemable financial instruments of nonpublic entities contained within Accounting Standards Codification ("ASC") Topic 480 with a scope exception and does not impact the accounting for these mandatorily redeemable instruments. For public business entities, ASU 2017-11 is effective for annual reporting periods beginning after December 15, 2018, including interim periods within those fiscal years. For all other entities, the amendments in are effective for fiscal years beginning after December 15, 2019, and interim periods within fiscal years beginning after December 15, 2020. Early adoption is permitted for all entities, including adoption in an interim period. The Company early adopted ASU 2017-11 effective January 1, 2019, and its adoption had an immaterial impact on the Company's financial position, results of operations or cash flows.

In June 2018, the FASB issued ASU No. 2018-07, *Compensation — Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting* ("ASU 2018-07"). These amendments expand the scope of *Topic 718, Compensation—Stock Compensation* (which currently only includes share-based payments to employees) to include share-based payments issued to non-employees for goods or services. Consequently, the accounting for share-based payments to non-employees and employees will be substantially aligned. The ASU supersedes*Subtopic 505-50, Equity — Equity-Based Payments to Non-Employees*. This standard is effective for public business entities for annual periods beginning after December 15, 2018, including interim periods within those fiscal years, with early adoption permitted as long as ASU 2014-09 has been adopted by the Company. For all other entities, the amendments are effective for fiscal years beginning after December 15, 2019, and interim periods within fiscal years beginning after December 15, 2020. The Company early adopted this guidance, effective January 1, 2019, and its adoption had no material impact on the Company's financial position, results of operations or cash flows.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement* ("ASU 2018-13"), which removes, adds and modifies certain disclosure requirements for fair value measurements in Topic 820. The Company will no longer

be required to disclose the amount of and reasons for transfers between Level 1 and Level 2 of the fair value hierarchy as well as the valuation processes of Level 3 fair value measurements. However, the Company will be required to additionally disclose the changes in unrealized gains and losses included in other comprehensive income for recurring Level 3 fair value measurements and the range and weighted average of assumptions used to develop significant unobservable inputs for Level 3 fair value measurements. ASU 2018-13 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. The amendments relating to additional disclosure requirements will be applied prospectively for only the most recent interim or annual period presented in the initial year of adoption. All other amendments will be applied retrospectively to all periods presented upon their effective date. The Company early adopted this guidance, effective January 1, 2019, and its adoption had no material impact on the Company's financial position, results of operations or cash flows.

Recently issued accounting pronouncements

The Company qualifies as "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012 and has elected not to "opt out" of the extended transition related to complying with new or revised accounting standards, which means that when a standard is issued or revised and it has different application dates for public and nonpublic companies, the Company will adopt the newer revised standard at the time nonpublic companies adopt the new or revised standard and will do so until such time that the Company either (i) irrevocably elects to "opt out" of such extended transition period or (ii) no longer qualifies as an emerging growth company. The Company may choose to early adopt any new or revised accounting standards whenever such early adoption is permitted for nonpublic companies.

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments — Credit Losses (Topic 326)* ("ASU 2016-13"). The new standard adjusts the accounting for assets held at amortized costs basis, including marketable securities accounted for as available for sale, and trade receivables. The standard eliminates the probable initial recognition threshold and requires an entity to reflect its current estimate of all expected credit losses. The allowance for credit losses is a valuation account that is deducted from the amortized cost basis of the financial assets to present the net amount expected to be collected. For public business entities except smaller reporting companies, the guidance is effective for annual reporting periods beginning after December 15, 2019 and for interim periods within those fiscal years. For non-public entities and smaller reporting companies, the guidance was effective for annual reporting periods beginning after December 15, 2021. In November 2019, the FASB issued ASU No. 2019-10, which deferred the effective date for non-public entities to annual reporting periods beginning after December 15, 2022, including interim periods within those fiscal years. Early application is allowed. The Company expects to adopt this guidance effective January 1, 2023, and it is currently evaluating the impact on its consolidated financial statements and related disclosures.

In February 2016, the FASB issued ASU No. 2016-02*, Leases (Topic 842)* ("ASU 2016-02"), which sets out the principles for the recognition, measurement, presentation and disclosure of leases for both parties to a contract (i.e., lessees and lessors). The new standard requires lessees to apply a dual approach, classifying leases as either finance or operating leases based on the principle of whether or not the lease is effectively a financed purchase by the lessee. This classification will determine whether lease expense is recognized based on an effective interest method or on a straight-line basis over the term of the lease. A lessee is also required to record a right-of-use asset and a lease liability for all leases with a term of greater than 12 months regardless of their classification. Leases with a term of 12 months or less may be accounted for similar to existing guidance for operating leases today. For public business entities, ASU 2016-02 is effective for annual reporting periods beginning after December 15, 2018, including interim periods within those fiscal years, and early adoption is permitted. ASU 2016-02 initially required adoption using a modified retrospective approach, under which all years presented in the financial statements would be prepared under the revised guidance. For nonpublic entities, this guidance is effective for annual periods beginning after December 15, 2021. In July 2018, the FASB issued *ASU No. 2018-11, Leases (Topic 842)*, which added an optional transition method under which financial statements may be prepared under the revised guidance for the year of adoption, but not for prior years. Under the latter method, entities will recognize a cumulative catch-up adjustment to the opening balance of retained earnings in the period

of adoption. The Company expects to adopt this guidance effective January 1, 2022, and it is currently evaluating the impact on its consolidated financial statements and related disclosures.

In August 2018, the FASB issued ASU No. 2018-15, *Intangibles — Goodwill and Other — Internal-Use Software (Topic 35)*: *Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement that is a Service Contract*, which requires capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). For public business entities the guidance is effective for fiscal years beginning after December 15, 2020 including interim periods within those fiscal years. The Company expects to adopt this guidance effective on January 1, 2021 and is currently evaluating the impact, if any, adoption will have on its consolidated financial statements and related disclosure.

In December 2019, the FASB issued ASU 2019-12, *Income Taxes (ASC 740): Simplifying the Accounting for Income Taxes* ("ASU 2019-12"), which is intended to simplify various areas related to accounting for income taxes. ASU 2019-12 removes certain exceptions to the general principles in ASC 740 and also clarifies and amends existing guidance to improve consistent application. For public business entities the guidance is effective for annual reporting periods beginning after December 15, 2020 and for interim periods within those fiscal years. For non-public entities, the guidance is effective for annual reporting periods beginning after December 15, 2021 and for interim periods within years beginning after December 15, 2022, with early adoption permitted. The Company expects to adopt this guidance effective January 1, 2022, and it is currently evaluating the impact on its consolidated financial statements and related disclosures.

In August 2020, the FASB issued ASU 2020-06, "*Debt—Debt with Conversion and Other Options (Subtopic 470-20)*" and "*Derivatives and Hedging-Contracts in Entity's Own Equity (Subtopic 815-40): Accounting for Convertible instruments and contracts in an Entity's Own Equity*", which simplifies the accounting for certain financial instruments with characteristics of liabilities and equity, including convertible instruments and contracts on an entity's own equity. ASU 2020-06 is effective for the Company for fiscal years beginning after December 15, 2023, and interim periods within those fiscal years. Early adoption is permitted for fiscal years beginning after December 15, 2020, and interim periods within those fiscal years. Adoption is applied on a modified or full retrospective transition approach. The Company is currently evaluating the adoption date and impact, if any, adoption will have on its consolidated financial statements and related disclosure.

3. Fair value of financial assets and liabilities

The following tables present information about the Company's financial assets and liabilities measured at fair value on a recurring basis and indicate the level of the fair value hierarchy used to determine such fair values (in thousands):

	Fair value measurements as of December 31, 2019			
	Level 1	Level 2	Level 3	Total
Assets				
Cash equivalents	$ 6,364	$ —	$ —	$ 6,364
	$ 6,364	$ —	$ —	$ 6,364
Liabilities				
Preferred stock warrant liability	$ —	$ —	$ 3,396	$ 3,396
	$ —	$ —	$ 3,396	$ 3,396

	Fair value measurements at December 31, 2020			
	Level 1	Level 2	Level 3	Total
Assets				
Cash equivalents	$ 23,456	$ —	$ —	$ 23,456
Short-term investments	14,998	—	—	14,998
	$ 38,454	$ —	$ —	$ 38,454
Liabilities				
Preferred stock warrant liability	$ —	$ —	$ 4,117	$ 4,117
	$ —	$ —	$ 4,117	$ 4,117

During the years ended December 31, 2019 and 2020, respectively, there were no transfers between Level 1, Level 2 and Level 3.

Valuation of short-term investments

U.S. Treasury bonds were valued by the Company using quoted prices in active markets for similar securities, which represents a Level 1 measurement within the fair value hierarchy.

Valuation of preferred stock warrant liability

The warrant liability is related to the warrants (the "Warrants") to purchase shares of the Company's Series A1, B1, and C1 redeemable convertible preferred stock (see Note 11). The fair value of the warrant liability was determined based on inputs not observable in the market, which represents a Level 3 measurement within the fair value hierarchy.

The Company used the Black-Scholes option-pricing model, which incorporates assumptions and estimates, to value the warrant liability. Key estimates and assumptions impacting the fair value measurement include (i) the fair value per share of the underlying shares of applicable series of redeemable convertible preferred stock issuable upon exercise of the Warrants, (ii) the remaining contractual term of the Warrants, (iii) the risk-free interest rate, (iv) the expected dividend yield and (iv) expected volatility of the price of the underlying applicable series of redeemable convertible preferred stock. The Company estimated the fair value per share of the underlying applicable series of redeemable convertible preferred stock based, in part, on the results of third-party valuations and additional factors deemed relevant. The risk-free interest rate was determined by reference to the U.S. Treasury yield curve for time periods approximately equal to the remaining contractual term of the Warrant. The Company estimated a zero expected dividend yield based on the fact that the Company has never paid or declared dividends and does not intend to do so in the foreseeable future. As the Company has historically been a private company and lacks company-specific historical and implied volatility information of its stock, the expected stock volatility was based on the historical volatility of publicly traded peer companies for a term equal to the remaining contractual term of the Warrant.

The table below quantifies the weighted average of the unobservable inputs used to fair value the preferred stock warrant liability:

	Year ended December 31,	
	2019	2020
Fair value of Series A1 preferred stock	$ 0.57	$ 0.50
Fair value of Series B1 preferred stock	$ 1.05	$ 1.26
Fair value of Series C1 preferred stock	$ —	$ 1.23
Remaining contractual term (in years)	7.7	7.3
Risk-free interest rate	2.0%	0.6%
Expected dividend yield	0%	0%
Expected volatility	25.8%	40.0%

The following table provides a rollforward of the aggregate fair values of the Company's preferred stock warrant liability, for which fair values are determined using Level 3 inputs (in thousands):

	Year ended December 31,	
	2019	2020
Balance, beginning of year	$ 3,645	$ 3,396
Initial fair value of warrants issued during the period	—	652
Change in fair value	(249)	69
Balance, end of the year	$ 3,396	$ 4,117

Valuation of derivative liability

The derivative liability is related to the conversion option included within the Unsecured Subordinated Convertible Promissory Notes ("Convertible Notes") issued in February 2020 (see Note 9). The Convertible Notes provided a conversion option whereby upon the closing of a specified financing event the Convertible Notes would automatically convert into shares of the same class and series of capital stock of the Company issued to other investors in the financing at a conversion price equal to 80% of the price per share of the securities paid by the other investors. This conversion option was determined to be an embedded derivative required to be bifurcated and accounted for separately from the notes. The fair value of the derivative liability was determined based on inputs not observable in the market, which represents a Level 3 measurement within the fair value hierarchy.

Upon the closing of the Convertible Notes management determined that the probability of completing the specified financing event was 100%; thus, the value of the automatic conversion option was deemed to be 20% of the fair value of the capital stock to be issued upon conversion of the Convertible Notes, or $2.4 million. This amount represented the fair value of the embedded derivative at issuance (see Note 9).

Upon the occurrence of the specified financing event in April 2020, the Convertible Notes were converted into 10,351,063 shares of Series C1 Preferred Stock, as defined (see Note 9), and the derivative liability of $2.4 million was extinguished.

4. Short-term investments

Short-term investments by investment type consisted of the following (in thousands):

	December 31, 2020			
	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value
US Treasury bonds	$ 14,997	$1	$—	$ 14,998
	$ 14,997	$1	$—	$ 14,998

5. Inventory

Inventory consisted of the following (in thousands):

	December 31,	
	2019	2020
Raw materials	$4,477	$6,754
Work in process	299	1,190
Finished goods	976	1,021
Total	$5,752	$8,965

Raw materials, work in process and finished goods were net of adjustments to net realizable value of $0.5 million and $1.0 million, as of December 31, 2019 and 2020, respectively.

6. Prepaid expenses and other current assets

Prepaid expenses and other current assets consisted of the following (in thousands):

	December 31,	
	2019	2020
Prepaid commitment fee	$ —	$ 275
Prepaid financing fees	—	62
Contract asset	810	471
Deposits	146	1,148
Lease receivables, current portion	482	325
Other	336	839
	$1,774	$3,120

7. Property and equipment, net

Property and equipment, net consisted of the following (in thousands):

	December 31,	
	2019	2020
Manufacturing and laboratory equipment	$12,298	$ 12,961
Computer hardware and software	921	1,088
Office furniture and fixtures	282	343
Leasehold improvements	2,922	2,996
	16,423	17,388
Less: Accumulated depreciation	(8,831)	(10,336)
	$ 7,592	$ 7,052

Depreciation and amortization expense related to property and equipment was $1.5 million for the years ended December 31, 2019 and 2020. The Company had less than $0.1 million fully depreciated assets disposed of during the year ended December 31, 2020 and none in the year ended December 31, 2019.

8. Accrued expenses and other current liabilities

Accrued expenses and other current liabilities consisted of the following (in thousands):

	December 31,	
	2019	2020
Accrued employee compensation and benefits expense	$2,246	$3,083
Vendor accrual	797	1,685
Accrued warranty expense	848	637
Accrued interest	771	330
Deferred rent, current portion	79	118
Accrued taxes	613	688
Other	82	113
	$5,436	$6,654

9. Long-term debt

The components of the Company's long-term debt consisted of the following (in thousands):

	December 31,	
	2019	2020
Notes Payable	$18,000	$25,000
Payment in kind interest	—	1,145
Less: Unamortized discount	(194)	(1,335)
Long-term debt, net of discount	$17,806	$24,810

Term loan agreements

2018 Term Loan

In April 2018, the Company entered into an $18.0 million term loan with a lender (the "2018 Term Loan"), which was paid in full in May 2020. The 2018 Term Loan bore interest at a rate equal to the greater of (i) the prime rate as reported by The Wall Street Journal plus 5.15%, and (ii) 9.65% per annum. The 2018 Term Loan was to be repaid in 48 monthly payments consisting of 23 monthly payments of interest only followed by 25 equal monthly payments of principal and interest. The 2018 Term Loan maturity date was April 1, 2022. In accordance with the terms of the 2018 Term Loan, if certain covenants were satisfied, such as (a) no event of default and (b) borrower completed equity financing in excess of $14.9 million prior to August 15, 2019 (See Note 10), the interest-only payment period of the loan was extended for an additional six months. The extension of the interest-only period resulted in a reduction of the number of principal and interest payments from 25 to 19.

The Company incurred debt issuance costs of $0.4 million in connection with the 2018 Term Loan. These costs were recorded as debt discount and were amortized to interest expense, using the effective interest method, over the term of the loan. The unamortized discount associated with the 2018 Term Loan was $0.2 million and $0 as of December 31, 2019 and 2020, respectively.

In addition to monthly interest payments, upon early termination of the loan, a non-refundable, end-of-term charge of $1.3 million was due and payable to the lender. The end-of-term charge was accrued as interest expense, using the effective interest method, over the term of the loan and was included in accrued expenses and other current liabilities on the Company's consolidated balance sheets.

In the event of prepayment, the 2018 Term Loan provided for a prepayment fee equal to the following percentages of the amount being prepaid: (i) if such amounts are prepaid prior to the one-year anniversary of the closing date, 3.0%; (ii) after the first anniversary of the closing date, through the second anniversary of the closing date, 2.0% and (iii) after the third anniversary of the closing date; 0.5%. The Company's obligations under the 2018 Term Loan agreement were secured by a first-priority security interest in all of its assets, including intellectual property.

The Company was required to comply with certain financial and non-financial covenants as defined in the 2018 Term Loan agreement, including a minimum liquidity requirement of the lesser of $7.0 million and the aggregate amount of any revolving indebtedness and outstanding obligations as of any date. In the event this requirement was not met, the Company was subject to a six-month rolling minimum revenue requirement. The Company was in compliance with all financial and non-financial covenants as of December 31, 2019.

The Company repaid the 2018 Term Loan in full in May 2020 using the proceeds from the 2020 Term Loan as discussed below. The Company paid $19.4 million to extinguish the outstanding principal and accrued interest owed, including the non-refundable end-of-term exit fee of $1.3 million (out of which $0.6 million was accrued for in prior years as interest expense) and an early termination fee of $0.1 million.

The loss on extinguishment of debt was $0.8 million which included the write-off of unamortized financing and end-of-term exit fee costs of $0.7 million and $0.1 million in early payment and documentation fees, and was

included as a component of other income (expense) in the consolidated statements of operations. Interest expense on the 2018 Term Loan totaled $2.4 million and $0.9 million for the years ended December 31, 2019 and 2020, respectively, which includes amortization of the debt discount of $0.5 million and $0.3 million during the years ended December 31, 2019 and 2020, respectively.

2020 Term Loan

In May 2020, the Company entered into a $60.0 million term loan facility with a new lender (the "2020 Term Loan"), which provides for borrowings of an initial $25.0 million tranche upon closing and options to borrow up to an aggregate of $35.0 million in two additional tranches of $20.0 million under the second tranche (the "Term B Loan") and $15.0 million under the third tranche (the "Term C Loan") subject to certain milestones. The milestone entitling the Company to draw on the Term B Loan is achieved when the Company has received, on a cumulative basis, a predefined number of new system orders during a consecutive twelve month period between January 1, 2020 and November 14, 2021. The milestone entitling the Company to draw down the Term C Loan is achieved when the Company has received, on a cumulative basis, a predefined number of new system orders during a consecutive eighteen month period between January 1, 2020 and May 14, 2022. At closing, the Company issued warrants to purchase 1,195,652 shares of Series C1 Preferred Stock to the lender with an exercise price of $1.15 per share which were accounted for as debt discount. The Company is obligated to issue additional warrants to the lender with an aggregate exercise value, based on the fair market value of the preferred stock at the time of the draw down, equal to $1.1 million and $0.8 million upon drawing down the Term B Loan and Term C Loan, respectively. The Company paid a $0.8 million facility fee in connection with the term loan facility. The Company allocated the $0.8 million term loan facility fee on a pro-rata basis based on the amount available to be drawn down under each tranche. The Company allocated $0.3 million to the initial draw which was recorded within debt issuance cost as an offset to the carrying value of the 2020 Term Loan and amortized over the term of the loan within interest expense on the consolidated statement of operations. Additionally, the Company allocated $0.3 million to Term B Loan and $0.2 million to Term C Loan and recorded within prepaid expenses and other current assets on the consolidated balance sheet and amortized on a straight-line basis over the debt access period within interest expense on the consolidated statement of operations.

The 2020 Term Loan's interest rate can be elected each quarter by the Company as either (a) 12%, up to 7% of which may be Payment in Kind ("PIK") interest or (b) 13% PIK interest. Accrued interest on the 2020 Term Loans is payable quarterly. All outstanding principal, including any and all accrued PIK interest, is due and payable in full on May 14, 2025, the maturity date. The Company has the option to prepay all or a portion of the principal balance prior to the maturity date, subject to a prepayment premium equal to a percentage of the principal amount of the loan prepaid, as follows: (i) if such amount is prepaid prior to the one-year anniversary of the closing date, 8.0%; (ii) after the first anniversary through the second anniversary, 7.0%; (iii) after the second anniversary through the third anniversary, 5.0%; (iv) after the third anniversary through the fourth anniversary, 3.0%; and (v) after the fourth anniversary outstanding fees and no prepayment premium.

In the event of a change of control, defined as (a) any person or group having acquired (i) beneficial ownership of 49.0% or more of the voting equity interests, or (ii) the power to elect a majority of the members of the board of directors of the Company or (b) the Company ceasing to beneficially own and control 100% of the economic and voting equity interests of each of its wholly-owned subsidiaries, the Company must immediately pay the lender all the outstanding principal of the 2020 Term Loan, the prepayment premium, and any other outstanding fees.

The 2020 Term Loan agreement includes certain financial and non-financial covenants. These covenants include exceeding certain minimum revenue thresholds on a trailing twelve-month basis, maintaining a minimum balance of $1.5 million in cash and cash equivalents, maintain all inventory in good and marketable condition, and reporting requirements for any material adverse changes in the Company's financial condition. As of December 31, 2020, the Company was in compliance with all covenants under the 2020 Term Loan.

The Company incurred debt issuance costs of $1.5 million in connection with the 2020 Term Loan including $0.9 million of professional fees and $0.6 million for the fair value of warrants issued with the debt. Interest expense on the 2020 Term Loan totaled $2.2 million for the year ended December 31, 2020, which includes the

amortization of the debt discount of $0.2 million and non-cash PIK interest of $1.1 million. As of December 31, 2020, the unamortized debt discount was $1.3 million. The accrued interest on the 2020 Term Loan totals $0.3 million at December 31, 2020, which is included in accrued expenses and other current liabilities in consolidated balance sheets.

As of December 31, 2020, the aggregate future principal payments on the Company's outstanding 2020 Term Loan for the next five years were as follows (in thousands):

2021	$ —
2022	—
2023	—
2024	—
2025	26,145
	26,145
Less: Unamortized discount	(1,335)
Long-term debt, net of discount	$24,810

Convertible Notes

In February 2020, the Company issued Convertible Notes to several investors in the aggregate amount of $9.5 million with a stated interest rate of 1.5% per annum and a maturity date of February 28, 2021. The Convertible Notes provided a conversion option whereby upon the closing of a financing event, in which the aggregate gross proceeds of the issuance of preferred stock totaled at least $20.0 million, the notes would automatically convert into shares of the same class and series of capital stock of the Company issued to other investors in the financing at a conversion price equal to 80% of the price per share paid by the other investors. The conversion option met the definition of an embedded derivative and was required to be bifurcated and accounted for separately from the notes. The proceeds from the Convertible Notes were allocated between the derivative liability, with a fair value at issuance of $2.4 million, and the notes, with an initial carrying value of $7.1 million, included in long-term liabilities on the Company's consolidated balance sheets. The difference between the initial carrying value of the notes and the stated value of the notes represented a discount and that was accreted to interest expense over the term of the Convertible Notes using the effective interest method.

In April 2020, the Convertible Notes, including outstanding principal and accrued interest totaling $9.5 million, were automatically converted into 10,351,063 shares of Series C1 Preferred Stock. Upon conversion, the remaining unamortized discount was recognized as loss on extinguishment of debt in the consolidated statement of operations.

Interest expense on the Convertible Notes totaled $0.4 million for the year ended December 31, 2020, which includes amortization of the debt discount of $0.3 million.

10. Redeemable convertible preferred stock

The Company has issued Series A1 redeemable convertible preferred stock (the "Series A1 Preferred Stock"), Series B1 redeemable convertible preferred stock (the "Series B1 Preferred Stock"), Series C1 redeemable convertible preferred stock (the "Series C1 Preferred Stock"), and Series C2 redeemable convertible preferred stock (the "Series C2 Preferred Stock"). The Series A1 Preferred Stock, Series B1 Preferred Stock, Series C1 Preferred Stock, and Series C2 Preferred Stock are collectively referred to as the "Preferred Stock".

In April 2018, the Company closed the first tranche of a Series B1 Preferred Stock Agreement (the "Series B1 Agreement") with several new investors and a select group of its current investors. The Company issued and sold 45,142,425 shares of Series B1 Preferred Stock at $1.00 per share for gross proceeds of $37.1 million and the conversion of $8.0 million of principal and accrued interest from the notes issued in December 2017. The

Series B1 Agreement obligated investors to participate in the second tranche closing of Series B1 Preferred Stock (the “Milestone Closing”).

In August 2019, the holders of Series B1 Preferred Stock elected to exercise the Milestone Closing in advance of the achievement of the Milestone Closing provisions to purchase 11,750,000 shares of Series B1 Preferred Stock at a purchase price of $1.00 per share. The Company also had a supply-related milestone with one of the Series B1 Preferred Stock investors (“Second Milestone Closing”). The Second Milestone Closing was achieved in August 2019, and the investor purchased 3,125,000 shares of Series B1 Preferred Stock at a price of $1.00 per share. The gross proceeds under the Milestone Closing and Second Milestone totaled $14.9 million with issuance costs of less than $0.1 million.

In April 2020, the Company issued and sold 23,611,208 shares of Series C1 Preferred Stock and 20,301,829 shares of Series C2 Preferred Stock to new and existing investors at a price of $1.15 per share for gross proceeds of $27.2 million and $23.3 million, respectively. Additionally, the Company’s Convertible Notes, including outstanding principal and accrued interest totaling $9.5 million (see Note 9), were automatically converted into 10,351,063 shares of Series C1 Preferred Stock. The Company incurred issuance costs in connection with this transaction of $0.6 million and recorded them as a reduction to the carrying value of the Series C1 Preferred Stock and Series C2 Preferred Stock.

As of each balance sheet date, the Preferred Stock consisted of the following (in thousands, except for share data):

	December 31, 2019				
	Preferred stock authorized	Preferred stock issued and outstanding	Carrying value	Liquidation preference	Common stock issuable upon conversion
Series A1 Preferred Stock	22,563,639	18,740,115	$ 17,282	$ 20,427	18,740,115
Series B1 Preferred Stock	61,217,425	60,017,425	64,568	90,026	60,017,425
	83,781,064	78,757,540	$ 81,850	$ 110,453	78,757,540

	December 31, 2020				
	Preferred stock authorized	Preferred stock issued and outstanding	Carrying value	Liquidation preference	Common stock issuable upon conversion
Series A1 Preferred Stock	22,563,639	18,740,115	$ 18,542	$ 21,176	18,740,115
Series B1 Preferred Stock	61,217,425	60,017,425	68,511	90,026	60,017,425
Series C1 Preferred Stock	57,372,796	33,962,271	40,632	58,585	33,962,271
Series C2 Preferred Stock	20,301,829	20,301,829	24,141	35,021	20,301,829
	161,455,689	133,021,640	$ 151,826	$ 204,808	133,021,640

The holders of the Preferred Stock have the following rights and preferences:

Voting

The holders of the Preferred Stock, except for Series C2 Preferred Stock which are non-voting shares, are entitled to vote, together with the holders of common stock voting as a single class, on all matters submitted to the stockholders for a vote. Each holder of Preferred Stock, except for Series C2 Preferred Stock which are non-voting shares, is entitled to the number of votes equal to the number of shares of common stock into which each share of Preferred Stock is convertible as of the record date for determining stockholders entitled to vote on such matter.

Conversion

Each share Preferred Stock, except for the Series C2 Preferred Stock, is convertible into shares of common stock at the option of the holder at any time after the date of issuance and without the payment of additional consideration

by the holder. Each share of the Series C2 Preferred Stock shall be convertible, at the option of the holder thereof, at any time after the date of issuance, into an equal number of shares of Series C1 Preferred Stock; provided, that, after conversion, each initial holder of Series C2 Preferred Stock would represent less than ten percent of the combined voting power of the Company's outstanding voting securities.

Each share of the Preferred Stock will be mandatorily converted upon the closing of a firm commitment underwritten public offering of the Company's common stock with gross proceeds to the Company of at least $30.0 million and at a price per share of not less than $3.00.

Notwithstanding the previous provision, no shares of Series C2 Preferred Stock shall automatically convert into any other class of capital stock of the Company unless and until the Company has authorized a sufficient number of shares of non-voting common stock to support the conversion of all such shares of Series C2 Preferred Stock into non-voting common stock. Upon the sale, assignment, transfer or other disposition of any shares of Series C2 Preferred Stock to a person or entity other than the initial holder of the Series C2 Preferred Stock, each such outstanding share of Series C2 Preferred Stock shall be automatically converted into one fully paid and non-assessable share of Series C1 Preferred Stock. Upon the occurrence of a Restriction Removal Event, defined as the holder of Series C2 Preferred Stock and the Company submitting a specified U.S. governmental body a notice or declaration concerning the proposed conversion and the governmental body takes no issue or the initial holder of the Series C2 Preferred Stock and the Company agree that such filing to with such governmental body is not necessary, each share of Series C2 Preferred Stock then outstanding shall be automatically converted into one fully paid and non-assessable share of Series C1 Preferred Stock.

The conversion ratio of each series of Preferred Stock is determined by dividing the Original Issue Price of each series by the Conversion Price of each series. The Original Issue Price per share is $1.00 for Series A1 Preferred Stock, $1.00 for Series B1 Preferred Stock, $1.15 for Series C1 Preferred Stock and $1.15 for Series C2 Preferred Stock. The Conversion Price per share is $1.00 for Series A1 Preferred Stock, $1.00 for Series B1 Preferred Stock, $1.15 for Series C1 Preferred Stock and $1.15 for Series C2 Preferred Stock, each subject to appropriate adjustment in the event of any stock split, stock dividend, combination or other similar recapitalization and other adjustments as set forth in the Company's certificate of incorporation, as amended and restated.

Dividends

From and after the date of issuance, each share of Series A1 Preferred Stock accrues a dividend at the rate of $0.04 per annum. The dividends accrue ratably on a quarterly basis, whether or not declared. The Preferred Stock accruing dividends shall be payable only when, as, and if declared by the Board of Directors and the Company shall be under no obligation to pay such Preferred Stock accruing dividends.

From and after the date of issuance, each share of Series B1 Preferred Stock accrues a dividend at the rate of $0.04 per annum. If the Series B1 Preferred Stock is not redeemed on any of the three eligible annual installments, per the redemption rights, the rate the dividend accrues is increased to $0.10 per share per annum. The dividends accrue ratably on a quarterly basis, whether or not declared. The Preferred Stock accruing dividends shall be payable only when, as, and if declared by the Board of Directors and the Company shall be under no obligation to pay such Preferred Stock accruing dividends.

From and after the date of issuance, each share of Series C1 and Series C2 Preferred Stock accrues a dividend at the rate of $0.046 per annum. If the Series C1 Preferred Stock is not redeemed on any of the three eligible annual installments, per the redemption rights, the rate the dividend accrues is increased to $0.115 per share per annum. The dividends accrue ratably on a quarterly basis, whether or not declared. The Preferred Stock accruing dividends shall be payable only when, as, and if declared by the Board of Directors and the Company shall be under no obligation to pay such Preferred Stock accruing dividends.

The holders of any Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall be entitled to be paid, on an equal basis, the amount due for any accrued dividends before any payment shall be made to the holders of Series A1 Preferred Stock.

Through December 31, 2020, no dividends have been declared on any series or class of stock.

Liquidation

In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Company, the holders of Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock then outstanding shall be entitled to be paid out of the assets of the Company available for distribution to its stockholders, and before any payment shall be made to the holders of Series A1 Preferred Stock or common stock or any other class or series of capital stock ranking on liquidation junior to the Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock by reason of their ownership thereof, an amount equal to the greater of (i) $1.725 per share for Series C1 Preferred Stock and Series C2 Preferred Stock and $1.50 per share for Series B1 Preferred Stock, all subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the applicable series of Preferred Stock, and (ii) the sum of (x) the Original Issue Price of the applicable series of Preferred Stock, (y) any accruing dividends accrued but unpaid on the applicable series of Preferred Stock, and (z) any other dividends declared but unpaid on the applicable series of Preferred Stock (the greater of clauses (i) and (ii) for the Series C1 Preferred Stock and Series C2 Preferred Stock, the “Series C Liquidation Preference” and the greater of clauses (i) and (ii) for the Series B1 Preferred Stock, the “Series B1 Liquidation Preference”). If upon any such liquidation, dissolution or winding up of the Company, the assets of the Company available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock the full amount to which they shall be entitled, the holders of shares of Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

Following the aforementioned payments to the holders of Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock, and before any payment shall be made to the holders of common stock by reason of their ownership thereof, the holders of Series A1 Preferred Stock then outstanding shall be entitled to be paid out of the assets of the Company available for distribution to its stockholders an amount equal to the sum of (x) $1.00 per share, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series A1 Preferred Stock, (y) any accruing dividends accrued but unpaid on the shares of Series A1 Preferred Stock, and (z) any other dividends declared but unpaid on the Series A1 Preferred Stock (the “Series A1 Liquidation Preference” and, together with the Series B1 Liquidation Preference and Series C Liquidation Preference, the “Liquidation Preferences”). If upon any such liquidation, dissolution or winding up of the Company, the assets of the Company available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series A1 Preferred Stock the full amount to which they shall be entitled, the holders of shares of Series A1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

After the payment of the applicable Liquidation Preferences to the holders of Preferred Stock, the assets of the Company available for the distribution to it stockholders shall be distributed among such holders in the following order: (1) the Series A1 Preferred Stock and common stock, pro rata based on the number of shares held by each such holder, on an as-converted basis, until the holders of shares of Series A1 Preferred Stock have received an aggregate per share amount in respect of the Series A1 Preferred Stock equal to the Series B1 Liquidation Preference;(2) among the holders of the Series B1 Preferred Stock, Series A1 Preferred Stock and common stock, pro rata based on the number of shares held by each such holder, on an as-converted basis, , until the holders of shares of Series B1 Preferred Stock have received an aggregate per share amount in respect of the Series B1 Preferred Stock equal to the Series C Liquidation Preference; and (3) among the holders of the Series C1 Preferred Stock, Series C2 Preferred Stock, Series B1 Preferred Stock, Series A1 Preferred Stock and common stock, pro rata based on the number of shares held by each such holder, on an as-converted basis.

Redemption

Unless otherwise prohibited by Delaware law governing distribution to stockholders, shares of Preferred Stock shall be redeemed by the Company at a price equal to the Liquidation Preference applicable to each series of Preferred Stock in three annual installments commencing not more than 60 days after the receipt by the Company of written notice, at any time on or after the fifth anniversary of the Series C1 original issue date, from the requisite holders, requesting redemption of all shares of Preferred Stock. The Preferred Stock shall be redeemed in the following amounts: one-third of the amount payable based on the Liquidation Preference shall be redeemed on the first installment, 50% of the aggregate amount of the amount unpaid calculated as of the second installment, and the remaining amount due on the third installment. On each installment, holders of Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall receive the amounts due based on the respective Liquidation Preferences per share before any payment is made to the holders of Series A1 Preferred Stock.

The Company entered into an agreement with a holder of Series B1 Preferred Stock that includes a special redemption right in the event the Company breaches specified conditions set forth in the agreement, including covenants around specified business activities the Company may participate in, specified business activity ratios and financial ratios related to investments and indebtedness. If the Company breaches the terms of the agreement, and does not cure such breach by the date that is one year following written notice of such breach, such holder of Series B1 Preferred Stock shall have the right to redeem all shares of Preferred Stock outstanding and held by such holder at a price equal to two times the applicable original issue price, plus any applicable dividends accrued but unpaid on such shares of Preferred Stock, plus any other dividends declared but unpaid on such shares of Preferred Stock. In such event, shares of Preferred Stock shall be redeemed by the Company in three annual installments commencing not more than 60 days after the receipt by the Company of written notice, at any time on or after the fifth anniversary of the special redemption date. In the event such holder of Series B1 Preferred Stock requests such special redemption, all other holders of Preferred Stock may elect to participate in such special redemption alongside the holders of Series B1 Preferred Stock. If any holder of Preferred Stock elects not to participate in the special redemption, their shares shall not be redeemed in accordance with the special redemption.

11. Preferred stock warrants

In connection with the 2020 Term Loan, the Company issued 1,195,652 warrants to purchase shares of Series C1 Preferred Stock at an exercise price of $1.15 per share. The Company's warrants were immediately exercisable and expire 10 years after issuance. The fair value of the warrants on the issuance date was $0.7 million. The Company also has outstanding warrants to purchase shares of Preferred Stock issued in connection with previous financing agreements.

As of December 31, 2019 and 2020, warrants to purchase the following classes of preferred stock outstanding consisted of the following (in thousands, except for share and per share data):

	December 31, 2019					
Issuance date	Contractual term (in years)	Series of redeemable convertible preferred stock	Balance sheet classification	Preferred shares issuable upon exercise of warrant	Weighted average exercise price	Warrant fair value
April 24, 2017	10	Series A1	Liability	3,823,524	$ 0.01	$ 2,146
April 12, 2018	10	Series B1	Liability	1,199,994	$ 0.01	1,250
				5,023,518		$ 3,396

	December 31, 2020					
Issuance date	Contractual term (in years)	Series of redeemable convertible preferred stock	Balance sheet classification	Preferred shares issuable upon exercise of warrant	Weighted average exercise price	Warrant fair value
April 24, 2017	10	Series A1	Liability	3,823,524	$ 0.01	$ 1,875
April 12, 2018	10	Series B1	Liability	1,199,994	$ 0.01	1,501
May 14, 2020	10	Series C1	Liability	1,195,652	$ 1.15	741
				6,219,170		$ 4,117

12. Common stock and common stock warrants

As of December 31, 2019 and 2020, the Company's amended certificate of incorporation authorized the issuance of 110,000,000 shares and 175,000,000 shares, respectively, of $0.01 par value common stock.

Each share of common stock entitles the holder to one vote on all matters submitted to a vote of the Company's stockholders. The holders of common stock, voting exclusively and as a separate class, are entitled to elect one director of the Company. Common stockholders are entitled to receive dividends, as may be declared by the board of directors, if any, subject to the preferential dividend rights of Preferred Stock. As of December 31, 2019 and 2020, no cash dividends had been declared or paid.

As of December 31, 2019 and 2020, the Company had reserved 97,958,513 and 158,227,380 shares, respectively, of common stock for the conversion of the outstanding Preferred Stock, exercise of outstanding stock options, the number of shares remaining available for grant under the Company's 2010 Stock Incentive Plan (see Note 13) and the exercise of outstanding warrants to purchase shares of common stock (see Note 11).

In prior years the Company issued warrants to purchase common stock in conjunction with previous financing arrangements. As of December 31, 2019 and 2020, warrants to purchase the common stock outstanding consisted of the following (in thousands, except for share and per share data):

	December 31, 2019			
Issuance date	Contractual term	Balance sheet classification	Shares of common stock issuable upon exercise of warrant	Weighted average exercise price
	(in years)			
July 24, 2017	10	Equity	129,359	$ 59.19
April 12, 2018	10	Equity	150,000	$ 0.20
			279,359	

	December 31, 2020			
Issuance date	Contractual term	Balance sheet classification	Shares of common stock issuable upon exercise of warrant	Weighted average exercise price
	(in years)			
July 24, 2017	10	Equity	129,340	$ 59.03
April 12, 2018	10	Equity	150,000	$ 0.20
			279,340	

13. Stock-based compensation

2010 stock option and grant plan

The Company's 2010 Stock Option and Grant Plan (the "2010 Plan") provides for the Company to grant incentive stock options or nonqualified stock options, restricted stock awards and other stock-based awards to employees, officers, directors and consultants of the Company.

At December 31, 2019, shares of common stock that may be issued under the 2010 Plan was 15,181,813. In April 2020, the Board of Directors approved an increase to the 2010 Plan shares by 9,547,105 shares. At December 31, 2020, shares of common stock that may be issued under the 2010 Plan shares was 24,728,918. As of December 31, 2019 and 2020, 1,202,711 shares and 5,327,509 shares, respectively, remained available for future grant under the 2010 Plan. Shares that are expired, forfeited, canceled or otherwise terminated without having been fully exercised will be available for future grant under the 2010 Plan. In addition, shares of common stock that are tendered to the Company by a participant to exercise an award are added to the number of shares of common stock available for future grants.

The 2010 Plan is administered by the Board of Directors or, at the discretion of the Board of Directors, by a committee of the board of directors. The exercise prices, vesting and other restrictions are determined at the discretion of the Board of Directors, or its committee if so delegated, except that the exercise price per share of stock options may not be less than 100% of the fair market value of a share of common stock on the date of grant and the term of the stock option may not be greater than ten years. Stock options granted to employees, officers, members of the Board of Directors and consultants typically vest over a four-year period. The Company's board of directors values the Company's common stock, taking into consideration its most recently available valuation of common stock performed by third parties as well as additional factors which may have changed since the date of the most recent contemporaneous valuation through the date of grant.

During the years ended December 31, 2019 and 2020, the Company granted to employees, officers and directors options to purchase 1,915,655 shares and 6,735,140 shares, respectively, of common stock. The Company recorded stock-based compensation expense for options granted to employees, officers, and directors of $0.5 million during each of the years ended December 31, 2019 and 2020.

The following table presents, on a weighted average basis, the assumptions used in the Black-Scholes option-pricing model to determine the grant-date fair value of stock options granted to employees and directors:

	Year ended December 31,	
	2019	2020
Risk-free interest rate	2.0%	0.4%
Expected term (in years)	6.0	6.0
Expected volatility	36.8%	42.4%
Expected dividend yield	0%	0%

Stock options

The following table summarizes the Company's stock option activity since December 31, 2019 (in thousands, except for share and per share data):

	Number of shares	Weighted average exercise price	Weighted average remaining contractual term (in years)	Aggregate intrinsic value
Outstanding as of December 31, 2019	13,898,090	$ 0.23	8.48	$ —
Granted	6,735,140	0.15		
Exercised	(1,296,938)	0.20		
Expired	(271,908)	0.28		
Forfeited	(1,041,319)	0.20		
Outstanding as of December 31, 2020	18,023,065	$ 0.19	8.12	$ 4,272
Options vested and expected to vest as of December 31, 2019	13,898,090	$ 0.21	8.48	$ 260
Options exercisable as of December 31, 2019	5,526,437	$ 0.23	8.25	$ 108
Options vested and expected to vest as of December 31, 2020	18,023,065	$ 0.19	8.12	$ 4,272
Options exercisable as of December 31, 2020	7,958,511	$ 0.22	7.24	$ 1,777

The aggregate intrinsic value of options is calculated as the difference between the exercise price of the stock options and the fair value of the Company's common stock for those options that had exercise prices lower than the fair value of the Company's common stock.

The intrinsic value of stock options exercised during the years ended December 31, 2019 and 2020 was less than $0.1 million and zero, respectively.

The weighted average grant-date fair value per share of stock options granted during the year ended December 31, 2019 and 2020 was $0.14 and $0.11, respectively.

Stock-based compensation

Stock-based compensation expense was classified in the consolidated statements of operations as follows (in thousands):

	Year ended December 31,	
	2019	2020
Cost of revenue	$ —	$ 47
General and administrative	473	378
Sales and marketing	—	58
Research and development	—	50
Total stock-based compensation expense	$ 473	$ 533

As of December 31, 2020, total unrecognized compensation expense related to unvested stock options held by employees and directors was $1.2 million, which is expected to be recognized over weighted average period of 1.4 years.

14. Income taxes

The components of the Company's loss before income tax expense are as follows (in thousands):

	Year ended December 31,	
	2019	2020
United States	$ (20,854)	$ (37,049)
Foreign	110	105
Loss before income tax provision	$ (20,744)	$ (36,944)

The components of income tax expense are as follows (in thousands):

	Year ended December 31,	
	2019	2020
Current income tax provision:		
Federal	$ —	$ —
State	—	54
Foreign	427	80
Total current income tax provision	427	134
Deferred income tax benefit:		
Federal	(4,532)	(7,455)
State	(2,510)	(282)
Foreign	—	—
Total deferred income tax benefit	(7,042)	(7,737)
Change in deferred tax asset valuation allowance	7,042	7,737
Total provision for income taxes	$ 427	$ 134

During the years ended December 31, 2019 and 2020, the Company did not record income tax benefits for the net operating losses incurred or for the research and development tax credits generated in each year, due to its uncertainty of realizing a benefit from those items. A reconciliation of the U.S. federal statutory income tax rate to the Company's effective income tax rate is as follows:

	Year ended December 31,	
	2019	2020
Federal statutory income tax rate	21.0%	21.0%
State income taxes, net of federal benefit	9.4	0.5
Federal and state research and development tax credits	1.2	0.9
Unrecognized tax benefits reserve and interest change	(2.1)	(0.2)
Change in valuation allowance	(31.4)	(20.8)
Permanent differences	(0.2)	(0.3)
Loss on extinguishment of debt	—	(1.2)
Other	(0.1)	(0.3)
Effective income tax rate	(2.2)%	(0.4)%

Net deferred tax assets consisted of the following (in thousands):

	December 31,	
	2019	2020
Deferred tax assets:		
Net loss carryforwards	$ 45,065	$ 52,624
Research and development tax credit carryforwards	5,019	5,425
Research and development capitalized costs	3,568	3,636
Inventory	171	148
Accrued expenses	540	644
Depreciation	317	—
Other	96	88
Total deferred tax assets	54,776	62,565
Deferred tax liabilities:		
Depreciation	—	(52)
Total deferred tax liabilities	—	(52)
Net deferred tax assets	54,776	62,513
Valuation allowance	(54,776)	(62,513)
Net deferred tax assets	$ —	$ —

As of December 31, 2020, the Company had U.S. federal and state net operating loss (“NOL”) carryforwards of $212.5 million and $106.7 million, respectively, which may be available to offset future taxable income and begin to expire at various dates beginning in 2027 and 2025, respectively. Additionally, the Company had federal NOLs of $78.2 million generated since 2018 that will never expire. The Tax Cuts and Jobs Act (TCJA) enacted on December 22, 2017 limits a taxpayer’s ability to utilize an NOL deduction in a year to 80% taxable income for federal NOL arising in tax years beginning after 2017. The Coronavirus Aid, Relief, and Economic Security (CARES) Act enacted on March 27, 2020 removes the 80% taxable income limitation for federal NOL deductions in taxable years before January 1, 2021.

As of December 31, 2020, the Company also had U.S. federal and state research and development tax credit carryforwards of $3.1 million and $2.0 million, respectively, which may be available to offset future tax liabilities and begin to expire in 2028 and 2024, respectively.

Utilization of the U.S. federal and state NOL carryforwards and research and development tax credit carryforwards may be subject to a substantial annual limitation under Sections 382 and 383 of the Internal Revenue Code of 1986, and corresponding provisions of state law, due to ownership changes that have occurred previously or that could occur in the future. These ownership changes may limit the amount of carryforwards that can be utilized annually to offset future taxable income or tax liabilities. In general, an ownership change, as defined by Section 382, results from transactions increasing the ownership of certain stockholders or public groups in the stock of a corporation by more than 50% over a three-year period. The Company is in the process of conducting a study to assess whether a change of control has occurred or whether there have been multiple changes of control since inception due to the significant complexity and cost associated with such a study. If the Company has experienced a change of control, as defined by Section 382, at any time since inception, utilization of the NOL carryforwards or research and development tax credit carryforwards would be subject to an annual limitation under Section 382, which is determined by first multiplying the value of the Company’s stock at the time of the ownership change by the applicable long-term tax-exempt rate, and then could be subject to additional adjustments, as required. Any limitation may result in expiration of a portion of the net operating loss NOL carryforwards or research and development tax credit carryforwards before utilization. Further, until a study is completed by the Company and any limitation is known, no amounts are being presented as an uncertain tax position.

The Company has evaluated the positive and negative evidence bearing upon its ability to realize the deferred tax assets. The Company considered its history of cumulative net operating losses incurred since inception and has concluded that it is more likely than not that the Company will not realize the benefits of the deferred tax assets. Accordingly, a full valuation allowance has been established against the net deferred tax assets as of December 31, 2019 and 2020. The Company reevaluates the positive and negative evidence at each reporting period.

Changes in the valuation allowance for deferred tax assets relates primarily to the increase in NOL carryforwards and research and development tax credit carryforwards and were as follows (in thousands):

	December 31,	
	2019	2020
Valuation allowance as of beginning of year	$47,733	$54,776
Increases recorded to income tax provision	8,502	8,802
Decreases recorded as a benefit to income tax provision	(1,459)	(1,065)
Valuation allowance as of end of year	$54,776	$62,513

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows (in thousands):

	December 31,	
	2019	2020
Unrecognized tax benefits as of beginning of year	$151	$532
Additions for tax positions of prior years	425	37
Reductions for tax positions of prior years	(44)	—
Unrecognized tax benefits as of end of year	$532	$569

The Company recognizes interest and penalties related to unrecognized tax benefits in U.S. Federal, state, and foreign income tax expense. For the each of years ended December 31, 2019, and 2020, the Company recognized less than $0.1 million in interest and penalties. The Company had approximately $0.1 million of interest and penalties accrued as of both December 31, 2019 and 2020.

The Company files U.S. income tax returns as prescribed by the tax laws of the jurisdictions in which it operates. In the normal course of business, the Company is subject to examination by federal and state jurisdictions, where applicable. There are currently no pending tax examinations in the U.S. The Company has not received notice of examination by any jurisdictions in the U.S.

The Company has a branch in Germany that is under examination in its local country for the years ended December 31, 2016 through the year ended December 31, 2018. Any adjustments that may result from the examinations are not expected to have a material impact on the financial position, liquidity, or results of operations of the Company.

15. Net loss per share

Net loss per share attributable to the common stockholders.

Basic and diluted net loss per share attributable to common stockholders was calculated as follow (in thousands, except share and per share amounts):

	Year ended December 31,	
	2019	2020
Numerator:		
Net loss	$ (21,171)	$ (37,078)
Accretion of redeemable convertible preferred stock to redemption value	(2,745)	(3,745)
Cumulative redeemable convertible preferred stock dividends	(2,704)	(4,398)
Net loss attributable to common stockholders—basic and diluted	$ (26,620)	$ (45,221)
Denominator:		
Weighted average common shares outstanding—basic and diluted	1,735,253	1,793,272
Net loss per share attributable common stockholders—basic and diluted	$ (15.34)	$ (25.22)

The Company's potentially dilutive securities, which include stock options, redeemable convertible preferred stock, common stock warrants and preferred stock warrants, have been excluded from the computation of diluted net loss per share as the effect would be to reduce the net loss per share. Therefore, the weighted average number of common shares outstanding used to calculate both basic and diluted net loss per share attributable to common stockholders is the same. The Company excluded the following potential common shares, presented based on amounts outstanding at each period end, from the computation of diluted net loss per share attributable to common stockholders for the periods indicated because including them would have had an anti-dilutive effect:

	Year ended December 31,	
	2019	2020
Options to purchase common stock	13,898,090	18,023,065
Warrants to purchase common stock	279,359	279,340
Redeemable convertible preferred stock (as converted to common stock)	78,757,540	133,021,640
Warrants to purchase preferred stock (as converted to warrants to purchase common stock)	5,023,518	6,219,170
	97,958,507	157,543,215

16. Commitments and contingencies

Lease agreements

In October 2013, the Company entered into an operating lease for office and manufacturing space in in Lowell, Massachusetts, which expires in July 2026. The terms of the lease include options for a one-time, five-year extension of the lease and early termination of the lease in July 2024 as well as a $0.7 million tenant improvement allowance, which was fully utilized as of December 31, 2020.

The Company recognizes rent expense on a straight-line basis over the respective lease period. The Company has recorded deferred rent for rent expense incurred but not yet paid. Rent expense was $0.5 million and $0.4 million for the years ended December 31, 2019 and 2020, respectively.

Future minimum lease commitments under operating leases as of December 31, 2020 are as follows (in thousands):

Year ending December 31,	
2021	$ 441
2022	454
2023	468
2024	481
2025	494
Thereafter	293
Total	$2,631

Exit fee

In December 2016, in connection with the amendment of a then-outstanding loan agreement with the lender, the Company entered into an agreement under which it is obligated to pay the lender an exit fee in the amount of $0.8 million in the event of a qualifying exit event prior to December 31, 2026. A qualifying event is defined as any (i) liquidation, dissolution or winding up whether voluntary or involuntary; (ii) consolidation, merger or reverse merger; (iii) sale, lease, transfer, exclusive license, exchange, dividend or other disposition of all or substantially all of the Company's assets; (iv) issuance and/or sale of the Company's stock that is greater than 50% of the shares of common stock immediately following such issuance; (v) any other form of acquisition or business combination that results in a change of control at the Company; or (vi) the consummation of any public offering of shares of common stock. There were no amounts accrued for the exit fee as of December 31, 2019 or 2020, as the occurrence of a qualifying exit event was not deemed probable.

Supply agreement

In March 2020, the Company entered into an agreement with a supplier to provide raw materials used in the manufacturing process. As of December 31, 2020, the Company had committed to minimum payments under these arrangements totaling $0.9 million through December 31, 2022. The Company accrues a liability for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated. The Company had $0.1 million accrued for the supply agreement as of December 31, 2020.

Software subscription

During the year-ended December 31, 2020, the Company entered into a non-cancelable agreement with a service provider for software as a service and cloud hosting services. As of December 31, 2020, the Company had committed to minimum payments under these arrangements totaling $1.1 million through January 31, 2026. The Company accrues a liability for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated. There were no amounts accrued for the software subscription as of December 31, 2020.

Indemnification agreements

In the ordinary course of business, the Company may provide indemnification of varying scope and terms to customers, vendors, lessors, business partners and other parties with respect to certain matters including, but not limited to, losses arising out of breach of such agreements or from intellectual property infringement claims made by third parties. In addition, the Company has entered into indemnification agreements with members of its board of directors and certain of its executive officers that will require the Company, among other things, to indemnify them against certain liabilities that may arise by reason of their status or service as directors or officers. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is, in many cases, unlimited. To date, the Company has not incurred any material

costs as a result of such indemnifications. The Company is not currently aware of any indemnification claims and has not accrued any liabilities related to such obligations in its consolidated financial statements as of December 31, 2019 or 2020.

Legal proceedings

The Company is not a party to any litigation and does not have contingency reserves established for any litigation liabilities. At each reporting date, the Company evaluates whether or not a potential loss amount or a potential range of loss is probable and reasonably estimable under the provisions of the authoritative guidance that addresses accounting for contingencies. The Company expenses as incurred the costs related to such legal proceedings.

17. Benefit plans

The Company established a defined contribution savings plan under Section 401(k) of the Code. This plan covers all employees who meet minimum age and service requirements and allows participants to defer a portion of their annual compensation on a pre-tax basis. Matching contributions to the plan may be made at the discretion of the Company's board of directors. The Company made contributions of $0.1 million and $0.2 million to the plan during the years ended December 31, 2019 and 2020, respectively.

18. Subsequent events

For its consolidated financial statements as of December 31, 2020, for the year then ended, the Company evaluated subsequent events through March 22, 2021, the date on which those financial statements were issued.

In March 2021, the Company closed a Series D1 and D2 Preferred Stock Purchase Agreement with new investors and current investors. The Company raised $81.0 million and issued 22,086,725 shares of Series D1 Preferred Stock and 413,268 shares of Series D2 Preferred Stock at a purchase price of $3.60 per share. Dividends will be paid on the Series D1 and D2 preferred stock on an as converted basis when, as, and if paid on the Common Stock. In the event of a liquidation, the Series D1 and D2 stockholders earn dividends on an as converted basis if paid on common stock. The Series D1 and Series D2 preferred stockholders have liquidation preferences equal to Series B1, C1, and C2 preferred stock and senior to existing Series A1 Preferred Stock and Common Stock. Series D1 preferred stockholders are entitled to the voting rights consistent with those of the Series A1, Series B1, and Series C1 preferred stockholders. The Series D2 preferred stockholders do not have voting rights.

Events subsequent to original issuance of consolidated financial statements (unaudited)

In April 2021, the Company's contract with BARDA was modified resulting in an increase in the contract value of up to $1.0 million, an increase in the cost share reimbursement rate and specification of various developmental milestones.

In June 2021, the Company entered into a Sublease agreement for office and manufacturing space in Lexington, Massachusetts, which expires in June 2029. The Sublease agreement includes an option to terminate the sublease in July 2026, subject to an early termination fee. Monthly rent payments are fixed and future minimum lease payments over the term of the sublease is $5.6 million. The Company also has the right to use furniture and equipment specified in the Sublease agreement for $0.6 million in future payments over the term of the sublease with the option to purchase the furniture and equipment at the end of the sublease term. Concurrent with entering into the Sublease agreement, the Company executed an Option Agreement with the property owner which provides the Company the option to enter into a new direct lease for the Lexington facility for an additional five-years following expiration of the sublease.

On June 25, 2021, the Company filed an amended and restated certificate of incorporation, which effected recapitalization of the Company's then outstanding common stock to Class A common stock and authorized an additional new class of common stock (Class B common stock). Rights of the holders of Class A common stock and Class B common stock are identical, except with respect to voting and conversion. Additionally, on June 25, 2021, a certain number of investors exchanged Series C1 and D1 Preferred Stock to Series C2 and D2 Preferred Stock.

RAPID MICRO BIOSYSTEMS, INC.
Condensed consolidated balance sheets
(In thousands, except share and per share amounts)
(Unaudited)

	December 31, 2020	March 31, 2021
Assets		
Current assets:		
Cash and cash equivalents	$ 30,079	$ 108,635
Short-term investments	14,998	5,000
Accounts receivable	4,988	3,724
Inventory	8,965	9,777
Prepaid expenses and other current assets	3,120	2,733
Total current assets	62,150	129,869
Property and equipment, net	7,052	6,959
Other long-term assets	695	682
Deferred offering costs	—	1,306
Restricted cash	100	100
Total assets	$ 69,997	$ 138,916
Liabilities, Redeemable Convertible Preferred Stock and Stockholders' Deficit		
Current liabilities:		
Accounts payable	$ 4,468	$ 2,871
Accrued expenses and other current liabilities	6,654	6,474
Deferred revenue	4,423	5,140
Total current liabilities	15,545	14,485
Preferred stock warrant liability	4,117	15,565
Notes payable, net of unamortized discount	24,810	24,884
Deferred rent, long term	705	674
Other long-term liabilities	—	523
Total liabilities	45,177	56,131
Commitments and contingencies (Note 16)		
Redeemable convertible preferred stock (Series A1, B1, C1, C2, D1, and D2), $0.01 par value; 161,455,689 shares and 184,368,950 shares authorized at December 31, 2020 and March 31, 2021, respectively; 133,021,640 shares and 155,521,633 shares issued and outstanding at December 31, 2020 and March 31, 2021, respectively; liquidation preference of $285,995 at March 31, 2021	151,826	233,832
Stockholders' equity (deficit):		
Common stock, $0.01 par value; 175,000,000 shares and 200,000,000 shares authorized at December 31, 2020 and March 31, 2021, respectively; 3,064,626 shares and 4,646,252 shares issued and outstanding at December 31, 2020 and March 31, 2021, respectively	31	46
Additional paid-in capital	114,550	112,595
Accumulated deficit	(241,588)	(263,689)
Accumulated other comprehensive income	1	1
Total stockholders' deficit	(127,006)	(151,047)
Total liabilities, redeemable convertible preferred stock and stockholders' deficit	$ 69,997	$ 138,916

The accompanying notes are an integral part of these condensed consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.
Condensed consolidated statements of operations
(In thousands, except share and per share amounts)
(Unaudited)

	Three months ended March 31,	
	2020	2021
Revenue:		
Product revenue	$ 1,188	$ 3,718
Service revenue	410	1,067
Non-commercial revenue	1,401	210
Total revenue	2,999	4,995
Costs and operating expenses:		
Cost of product revenue	3,212	5,510
Cost of service revenue	951	1,137
Cost of non-commercial revenue	797	414
Research and development	1,438	2,147
Sales and marketing	1,466	2,275
General and administrative	2,371	3,203
Total costs and operating expenses	10,235	14,686
Loss from operations	(7,236)	(9,691)
Other income (expense):		
Interest expense	(763)	(932)
Change in fair value of preferred stock warrant liability	5	(11,448)
Other income (expense), net	7	(11)
Total other income (expense), net	(751)	(12,391)
Loss before income taxes	(7,987)	(22,082)
Income tax expense	20	19
Net loss	(8,007)	(22,101)
Accretion of redeemable convertible preferred stock to redemption value	(818)	(787)
Cumulative redeemable convertible preferred stock dividends	(788)	(1,411)
Net loss attributable to common stockholders — basic and diluted	$ (9,613)	$ (24,299)
Net loss per share attributable to common stockholders — basic and diluted	$ (5.44)	$ (7.58)
Weighted average common shares outstanding — basic and diluted	1,767,688	3,207,233

The accompanying notes are an integral part of these condensed consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.
Condensed consolidated statements of comprehensive loss
(In thousands)
(Unaudited)

	Three months ended March 31,	
	2020	2021
Net loss	$ (8,007)	$ (22,101)
Other comprehensive income:		
Unrealized gain on short-term investments, net of tax	—	—
Comprehensive loss	$ (8,007)	$ (22,101)

The accompanying notes are an integral part of these condensed consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.
Condensed consolidated statements of redeemable convertible preferred stock and stockholders' deficit
(In thousands, except share amounts)
(Unaudited)

	Redeemable convertible preferred stock		Common stock		Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive income	Total stockholders' deficit
	Shares	Amount	Shares	Amount				
Balances at January 1, 2020	78,757,540	$ 81,850	1,767,688	$ 18	$ 121,917	$ (204,510)	—	$ (82,575)
Accretion of redeemable convertible preferred stock to redemption value	—	818	—	—	(818)	—	—	(818)
Cumulative redeemable convertible preferred stock dividends	—	788	—	—	(788)	—	—	(788)
Stock-based compensation expense	—	—	—	—	120	—	—	120
Net loss	—	—	—	—	—	(8,007)	—	(8,007)
Balances at March 31, 2020	78,757,540	$ 83,456	1,767,688	$ 18	$ 120,431	$ (212,517)	$ —	$ (92,068)
Balances at January 1, 2021	133,021,640	$ 151,826	3,064,626	$ 31	$ 114,550	$ (241,588)	$ 1	$ (127,006)
Issuance of Series D1 redeemable convertible preferred stock, net of issuance costs of $1,174	22,086,725	78,338	—	—	—	—	—	—
Issuance of Series D2 redeemable convertible preferred stock, net of issuance costs of $18	413,268	1,470	—	—	—	—	—	—
Accretion of redeemable convertible preferred stock to redemption value	—	787	—	—	(787)	—	—	(787)
Cumulative redeemable convertible preferred stock dividends	—	1,411	—	—	(1,411)	—	—	(1,411)
Issuance of common stock upon exercise of stock options	—	—	337,111	3	64	—	—	67
Issuance of restricted common stock award	—	—	1,244,515	12	(12)	—	—	—
Stock-based compensation expense	—	—	—	—	191	—	—	191
Net loss	—	—	—	—	—	(22,101)	—	(22,101)
Balances at March 31, 2021	155,521,633	$ 233,832	4,646,252	$ 46	$ 112,595	$ (263,689)	$ 1	$ (151,047)

The accompanying notes are an integral part of these condensed consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.
Condensed consolidated statements of cash flows
(In thousands)
(Unaudited)

	Three months ended March 31,	
	2020	2021
Cash flows from operating activities:		
Net loss	$ (8,007)	$ (22,101)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization expense	474	344
Stock-based compensation expense	120	191
Change in fair value of preferred stock warrant liability	(5)	11,448
Noncash interest expense	316	139
Other, net	—	(3)
Changes in operating assets and liabilities		
Accounts receivable	1,209	1,264
Inventory	(1,004)	(812)
Prepaid expenses and other current assets	(166)	324
Other long-term assets	(1,002)	13
Accounts payable	(1,095)	(1,974)
Accrued expenses and other current liabilities	58	(781)
Deferred revenue	749	717
Deferred rent, long-term	38	(31)
Net cash used in operating activities	(8,315)	(11,262)
Cash flows from investing activities:		
Purchases of property and equipment	(79)	(251)
Maturity of investments	—	10,000
Net cash (used in) provided by investing activities	(79)	9,749
Cash flows from financing activities:		
Proceeds from issuance of redeemable convertible preferred stock, net of issuance costs	—	79,808
Proceeds from issuance of common stock upon option exercise	—	67
Proceeds from issuance of restricted stock award	—	523
Proceeds from issuance of convertible notes	9,500	—
Payments of debt issuance costs	—	—
Payment of deferred offering costs	—	(329)
Net cash provided by financing activities	9,500	80,069
Net increase in cash, cash equivalents and restricted cash	1,106	78,556
Cash, cash equivalents and restricted cash at beginning of period	12,611	30,179
Cash, cash equivalents and restricted cash at end of period	$ 13,717	$ 108,735

The accompanying notes are an integral part of these condensed consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.
Condensed consolidated statements of cash flows
(In thousands)
(Unaudited)

	Three months ended March 31,	
	2020	2021
Supplemental disclosure of cash flow information		
Cash paid for interest	$ 297	$ 339
Supplemental disclosure of non-cash investing activities		
Purchases of property and equipment in accounts payable	$ 99	$ —
Supplemental disclosure of non-cash financing activities		
Initial fair value of derivative liability	$ 2,375	$ —
Deferred offering costs included in accounts payable and accrued expenses	$ —	$ 978
Accretion of redeemable convertible preferred stock to redemption value	$ 818	$ 787
Cumulative redeemable convertible preferred stock dividends	$ 788	$ 1,411

The accompanying notes are an integral part of these condensed consolidated financial statements.

RAPID MICRO BIOSYSTEMS, INC.

Notes to condensed consolidated financial statements (Amounts in thousands, except share and per share amounts) (Unaudited)

1. Nature of the business and basis of presentation

Rapid Micro Biosystems, Inc. (the "Company") was incorporated under the laws of the State of Delaware on December 29, 2006. The Company develops, manufactures, markets and sells Growth Direct systems ("Systems") proprietary consumables, laboratory information management system ("LIMS") connection software, and services to address rapid microbial analysis used for quality control in the manufacture of pharmaceuticals, medical devices and personal care products. The Company's technology uses a highly sensitive camera and the natural auto fluorescence of living cells to identify and quantify microbial growth faster and more accurately than the traditional method, which relies on the human eye. The Company currently sells to customers in North America, Europe and Asia. The Company is headquartered in Lowell, Massachusetts.

The Company is subject to risks and uncertainties common to companies in the pharmaceutical and biotech quality control laboratory testing and instrumentation industry including, but not limited to, the successful development, commercialization, marketing and sale of products, fluctuations in operating results and financial risks, protection of proprietary knowledge and patent risks, dependence on key personnel, competition, technological and medical risks, customer demand, compliance with governmental regulations and management of growth. Potential risks and uncertainties also include, without limitation, uncertainties regarding the duration and magnitude of the impact of the COVID-19 pandemic on the Company's business and the economy in general. Products currently under development will require additional research and development efforts prior to commercialization and will require additional capital and adequate personnel and infrastructure. The Company's research and development may not be successfully completed, adequate protection for the Company's technology may not be obtained, the Company may not obtain necessary government regulatory approval, and approved products may not prove commercially viable. The Company operates in an environment of rapid change in technology and competition.

In March 2020, the World Health Organization declared the global novel coronavirus disease 2019 ("COVID-19") outbreak a pandemic. The impact of this pandemic has been and will likely continue to be extensive in many aspects of society, which has resulted in and will likely continue to result in significant disruptions to the global economy, as well as businesses and capital markets around the world. The Company cannot at this time predict the ultimate extent, duration, or full impact that the COVID-19 pandemic will have on its future financial condition and operations. The impact of the COVID-19 coronavirus outbreak on the Company's financial performance will depend on future developments, including the duration and spread of the pandemic and related governmental advisories and restrictions. These developments and the impact of COVID-19 on the financial markets and the overall economy are highly uncertain and cannot be predicted. If the financial markets and/or the overall economy are impacted for an extended period, the Company's results may be materially adversely affected.

Future impacts to the Company's business as a result of COVID-19 could include disruptions to the Company's manufacturing operations and supply chain caused by facility closures, reductions in operating hours, staggered shifts and other social distancing efforts; labor shortages; decreased productivity and unavailability of materials or components; limitations on its employees' and customers' ability to travel, and delays in shipments to and from affected countries and within the United States. While the Company maintains an inventory of finished products and raw materials used in its products, a prolonged pandemic could lead to shortages in the raw materials necessary to manufacture its products.

Basis of presentation

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with generally accepted accounting principles in the United States ("GAAP") regarding interim financial reporting

and include the accounts of the Company and its wholly owned subsidiaries in Germany and Switzerland. All intercompany accounts and transactions have been eliminated in consolidation. Certain information and note disclosures normally included in the consolidated financial statements prepared in accordance with GAAP have been condensed or omitted. Therefore, these condensed consolidated financial statements should be read in conjunction with the consolidated financial statements and notes included in the Company's audited consolidated financial statements for the year ended December 31, 2020. Any reference in these notes to applicable guidance is meant to refer to the authoritative GAAP as found in the Accounting Standards Codification ("ASC") and Accounting Standards Update ("ASU") of the Financial Accounting Standards Board ("FASB").

The accompanying condensed consolidated balance sheet as of March 31, 2021 and the condensed consolidated statements of operations, comprehensive loss, redeemable convertible preferred shares and shareholders' deficit, and of cash flows for the three months ended March 31, 2020 and 2021 are unaudited. The unaudited interim condensed consolidated financial statements have been prepared on the same basis as the audited annual consolidated financial statements and, in the opinion of management, reflect all adjustments, which include only normal recurring adjustments, necessary for the fair statement of the Company's financial position as of March 31, 2021 and the results of its operations and its cash flows for the three months ended March 31, 2020 and 2021. The financial data and other information disclosed in these notes related to the three months ended March 31, 2020 and 2021 are also unaudited. The results for the three months ended March 31, 2021 are not necessarily indicative of results to be expected for the year ending December 31, 2021, any other interim periods, or any future year or period.

These unaudited interim condensed consolidated financial statements should be read in conjunction with the audited annual consolidated financial statements as of December 31, 2019 and 2020 and for each of the two years in the period ended December 31, 2020.

Going concern

The Company has evaluated whether there are certain conditions and events, considered in the aggregate, that raise substantial doubt about the Company's ability to continue as a going concern within one year after the date that the condensed consolidated financial statements are issued.

Through March 31, 2021, the Company has funded its operations primarily with proceeds from product, service and non-commercial revenue, proceeds from sales of its redeemable convertible preferred stock, including borrowings under convertible debt arrangements that subsequently converted into redeemable convertible preferred stock, and proceeds from the issuance of term loans. The Company has incurred recurring losses since its inception, including net losses of $8.0 million and $22.1 million for three months ended March 31, 2020 and 2021, respectively. As of March 31, 2021, the Company had an accumulated deficit of $263.7 million. The Company expects to continue to generate significant operating losses for the foreseeable future. As of May 6, 2021, the date these interim condensed consolidated financial statements were available for issuance, the Company expects that its existing cash and cash equivalents, and short-term investments, will be sufficient to fund its operating expenses and capital expenditure requirements for at least twelve months following the date these condensed consolidated financial statements were available to be issued. The future viability of the Company beyond that point is dependent on its ability to raise additional capital to finance its operations.

The Company is seeking to complete an initial public offering ("IPO") of its common stock. In the event the Company does not complete an IPO, the Company expects to seek additional funding through private equity financing, debt financing, or other capital sources, including government funding arrangements or other strategic transactions. The Company may not be able to obtain financing on acceptable terms, or at all, and the terms of any financing may adversely affect the holdings or the rights of the Company's stockholders.

If the Company is unable to obtain funding, the Company will be required to delay, reduce or eliminate some or all of its research and development programs, product expansion or commercialization efforts, or the Company may be unable to continue operations. Although management continues to pursue these financing plans, there is

no assurance that the Company will be successful in obtaining sufficient funding on terms acceptable to the Company to fund continuing operations, if at all.

The condensed consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty. Accordingly, the condensed consolidated financial statements have been prepared on a basis that assumes the Company will continue as a going concern and which contemplates the realization of assets and satisfaction of liabilities and commitments in the ordinary course of business.

2. Summary of significant accounting policies

Use of estimates

The preparation of the Company's condensed consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the condensed consolidated financial statements, and the reported amounts of revenue and expenses during the reporting periods. Significant estimates and assumptions reflected in these condensed consolidated financial statements include, but are not limited to, calculating the standalone selling price for revenue recognition, the valuation of inventory, the valuation of common stock and stock-based awards, and the valuation of the preferred stock warrant liability. The Company bases its estimates on historical experience, known trends and other market-specific and relevant factors that it believes to be reasonable under the circumstances. On an ongoing basis, management evaluates its estimates when there are changes in circumstances, facts and experience. Changes in estimates are recorded in the period in which they become known. Actual results could differ from those estimates.

Due to the COVID-19 pandemic, there has been uncertainty and disruption in the global economy and financial markets. The Company is not aware of any specific event or circumstance that would require an update to its estimates or judgments or a revision of the carrying value of its assets or liabilities as of May 6, 2021, the date the condensed consolidated financial statements were available to be issued. These estimates may change as new events occur and additional information is obtained.

Other than policies noted below, there have been no significant changes to the significant accounting policies disclosed in Note 2 of the audited consolidated financial statements as of December 31, 2019 and 2020 and for the years ended December 31, 2019 and 2020.

Risk of concentrations of credit, significant customers and significant suppliers

Financial instruments that potentially expose the Company to concentrations of credit risk consist primarily of cash and cash equivalents, short-term investments and accounts receivable. Periodically, the Company maintains deposits in accredited financial institutions in excess of federally insured limits. The Company maintains its cash and cash equivalents with financial institutions that management believes to be of high credit quality. The Company has not experienced any losses on such accounts and does not believe it is exposed to any unusual credit risk beyond the normal credit risk associated with commercial banking relationships. The Company has not experienced any other-than-temporary losses with respect to its cash equivalents and investments and does not believe that it is subject to unusual credit risk beyond the normal credit risk associated with commercial banking relationships.

Significant customers are those which represent more than 10% of the Company's total revenue or accounts receivable balance at each respective balance sheet date. The following table presents customers that represent 10% or more of the Company's total revenue:

	Three months ended March 31,	
	2020	2021
Customer A	46.7%	18.7%
Customer B	20.5%	*
Customer C	*	17.5%
Customer D	*	16.1%
	67.2%	52.3%

* – less than 10%

The following table presents customers that represent 10% or more of the Company's accounts receivable:

	December 31, 2020	March 31, 2021
Customer A	10.1%	23.6%
Customer B	*	*
Customer C	*	14.9%
Customer D	18.7%	12.9%
Customer E	41.9%	*
Customer F	13.4%	*
Customer G	*	18.0%
	84.1%	69.4%

* – less than 10%

The Company relies on third parties for the supply and manufacture of its products as well as third-party logistics providers. In instances where these parties fail to perform their obligations, the Company may be unable to find alternative suppliers to satisfactorily deliver its products to its customers on time, if at all, which could have a material adverse effect on the Company's operating results, financial condition and cash flows and damage its customer relationships. There are no significant concentrations around a single third-party supplier or manufacturer for the year ended December 31, 2020 or the three months ended March 31, 2021.

Deferred offering costs

The Company capitalizes certain legal, accounting and other third-party fees that are directly associated with in-process equity financings as deferred offering costs until such financings are consummated. After consummation of an equity financing, these costs are recorded in stockholders' deficit as a reduction of additional paid-in capital generated as a result of the offering or as a reduction to the carrying value of redeemable convertible preferred stock. If the in-process equity financing is abandoned, the deferred offering costs will be expensed immediately as a charge to operating expenses in the consolidated statements of operations. As of December 31, 2020 and March 31, 2021, the Company had $0.1 million and $1.3 million, respectively, in deferred offering costs in the consolidated balance sheets.

Debt issuance costs

The Company capitalizes certain legal and other third-party fees that are directly associated with the issuance of debt as debt issuance costs. Debt issuance costs are recorded as a direct reduction of the carrying amount of the associated debt on the consolidated balance sheets and amortized as interest expense on the consolidated statement of operations using the effective interest method, which approximates straight-line method. As of December 31, 2020 and March 31, 2021, debt issuance costs totaled $1.3 million. During the three months ended March 31, 2020 and 2021, the Company recorded $0.2 million and $0.1 million, respectively in amortization of the debt issuance costs recorded within interest expense in the consolidated statement of operations.

Cash equivalents

The Company considers all highly liquid investments with an original maturity of 90 days or less at the time of purchase to be cash equivalents. Cash equivalents that are readily convertible to cash are stated at cost, which approximates fair value. At both December 31, 2020 and March 31, 2021, the Company held cash of $0.1 million in banks located outside of the U.S.

Restricted cash

As of December 31, 2020 and March 31, 2021, the Company was required to maintain guaranteed investment certificates of $0.1 million with maturities of three months to one year that are subject to an insignificant risk of changes in value. The guaranteed investment certificates are held for the benefit of the landlord in connection with an operating lease which has a remaining term of greater than one year and are classified as restricted cash (non-current) on the Company's consolidated balance sheets.

Accounts receivable

Accounts receivables are customer obligations that are unconditional. Accounts receivables are presented net of an allowance for doubtful accounts, which represents an estimate of amounts that may not be collectible. The Company performs ongoing credit evaluations of its customers and, if necessary, provides an allowance for doubtful accounts and expected losses. The Company writes off accounts receivable against the allowance when it determines a balance is uncollectible and no longer actively pursues collection of the receivable. The Company does not have any off-balance-sheet credit exposure related to customers. As of December 31, 2020 and March 31, 2021, the Company did not record an allowance for doubtful accounts.

Fair value measurements

Certain assets and liabilities of the Company are carried at fair value under GAAP. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. Financial assets and liabilities carried at fair value are to be classified and disclosed in one of the following three levels of the fair value hierarchy, of which the first two are considered observable and the last is considered unobservable:

- Level 1—Quoted prices in active markets for identical assets or liabilities.
- Level 2—Observable inputs (other than Level 1 quoted prices), such as quoted prices in active markets for similar assets or liabilities, quoted prices in markets that are not active for identical or similar assets or liabilities, or other inputs that are observable or can be corroborated by observable market data.
- Level 3—Unobservable inputs that are supported by little or no market activity that are significant to determining the fair value of the assets or liabilities, including pricing models, discounted cash flow methodologies and similar techniques.

The Company’s cash equivalents, short-term investments, and its redeemable convertible preferred stock warrant liability are carried at fair value, determined according to the fair value hierarchy described above (see Note 3). The carrying values of the Company’s accounts receivable, prepaid expenses and other current assets, accounts payable and accrued expenses and other current liabilities approximate their fair values due to the short-term nature of these assets and liabilities. The carrying value of the Company’s long-term debt approximates its fair value (a level 2 measurement) at each balance sheet date due to its variable interest rate, which approximates a market interest rate.

Product warranties

The Company offers a one-year limited standard assurance warranty on System sales, which is included in the selling price. The accrued warranty cost is based on estimated material, labor and other costs that the Company

expects to incur to fulfill the warranty obligation. The warranty accrual is included in accrued expenses and other current liabilities in the consolidated balance sheets. The following table presents a summary of changes in the amount reserved for warranty cost (in thousands):

	Three months ended March 31,	
	2020	2021
Balance, beginning of the period	$ 848	$ 637
Warranty provisions	1	—
Warranty repairs	(86)	(19)
Balance, end of the period	$ 763	$ 618

Segment information

The Company determined its operating segment after considering the Company's organizational structure and the information regularly reviewed and evaluated by the Company's chief operating decision maker ("CODM") in deciding how to allocate resources and assess performance. The Company has determined that its CODM is its Chief Executive Officer. The CODM reviews the financial information on a consolidated basis for purposes of evaluating financial performance and allocating resources. On the basis of these factors, the Company determined that it operates and manages its business as one operating segment, that develops, manufactures, markets and sells Systems and related LIMS connection software, consumables and services; and accordingly has one reportable segment for financial reporting purposes. Substantially all of the Company's long-lived assets are held in the United States.

Revenue recognition

Remaining performance obligations

The Company does not disclose the value of remaining performance obligations for (i) contracts with an original contract term of one year or less, (ii) contracts for which the Company recognizes revenue at the amount to which it has the right to invoice when that amount corresponds directly with the value of services performed, and (iii) variable consideration allocated entirely to a wholly unsatisfied performance obligation or to a wholly unsatisfied distinct service that forms part of a single performance obligation. The Company does not have material remaining performance obligations associated with contracts with terms greater than one year.

Contract balances from contracts with customers

Contract assets arise from unbilled amounts in customer arrangements when revenue recognized exceeds the amount billed to the customer and the Company's right to payment is conditional and not only subject to the passage of time. The Company had $0.5 million in contract assets as of December 31, 2020 and March 31, 2021, included in prepaid expenses and other current assets. These balances primarily relate to the BARDA agreement.

Contract liabilities represent the Company's obligation to transfer goods or services to a customer for which it has received consideration (or the amount is due) from the customer. The Company has a contract liability related to service revenue, which consists of amounts that have been invoiced but that have not been recognized as revenue. Amounts expected to be recognized as revenue within 12 months of the balance sheet date are classified as current deferred revenue and amounts expected to be recognized as revenue beyond 12 months of the balance sheet date are classified as noncurrent deferred revenue. The Company did not record any non-current deferred revenue as of December 31, 2020 or March 31, 2021. Deferred revenue was $4.4 million and $5.1 million at December 31, 2020 and March 31, 2021, respectively. Revenue recognized during the three months ended March 31, 2020 and 2021, that was included in deferred revenue at the prior year end was $0.4 million and $1.2 million, respectively.

Disaggregated revenue

The Company disaggregates revenue based on the recurring and non-recurring, and commercial and non-commercial, nature of the underlying sale. Recurring revenue includes sales of consumables and service contracts.

Non-recurring revenue includes sales of Systems, LIMS connection software, validation services, field service, and revenue under the Company's contract with BARDA. The following table presents the Company's revenue by the recurring or non-recurring and commercial or non-commercial nature of the revenue stream (in thousands):

	Three months ended March 31,	
	2020	2021
Product and service revenue — recurring	$ 859	$ 1,606
Product and service revenue — non-recurring	739	3,179
Non-commercial revenue — non-recurring	1,401	210
Total revenue	$ 2,999	$ 4,995

The following table presents the Company's revenue by customer geography (in thousands):

	Three months ended March 31,	
	2020	2021
United States	$ 1,678	$ 2,329
Germany	502	325
Switzerland	406	1,041
Rest of world	413	1,300
Total revenue	$ 2,999	$ 4,995

Advertising costs

Advertising costs are expensed as incurred and are included in sales and marketing expenses in the consolidated statements of operations. Advertising costs were less than $0.1 million during each of the three months ended March 31, 2020 and 2021.

Stock-based compensation

The Company measures all stock-based awards granted to employees, officers and directors based on their fair value on the date of the grant and recognizes compensation expense for those awards over the requisite service period, which is generally the vesting period of the respective award. The Company issues stock-based awards with only service-based vesting conditions and records the expense for these awards using the straight-line method.

The Company measures all restricted common stock granted to employees based on the common stock value on the date of grant. The purchase price of the restricted common stock is the common stock value on the date of grant. The restricted common stock includes a repurchase right, whereas upon the occurrence of a specific event, the Company shall have the right to repurchase unvested restricted common stock shares. At December 31, 2020 and March 31, 2021, the Company has zero and $0.5 million, respectively, in unvested restricted common stock liability included in other long-term liabilities.

Comprehensive loss

Comprehensive loss includes net loss as well as other changes in stockholders' deficit that result from transactions and economic events other than those with stockholders. The Company did not have comprehensive income or loss for the three months ended March 31, 2020 and 2021.

Recently adopted accounting pronouncements

In August 2018, the FASB issued ASU No. 2018-15, Intangibles — Goodwill and Other — Internal-Use Software (Topic 35): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement that is a Service Contract, which requires capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). For public business entities

the guidance is effective for fiscal years beginning after December 15, 2020, and all interim periods beginning after December 15, 2021. The Company adopted this guidance effective on January 1, 2021 and adoption did not have an impact on the condensed consolidated financial statements and related disclosure.

Recently issued accounting pronouncements

The Company qualifies as “emerging growth company” as defined in the Jumpstart Our Business Startups Act of 2012 and has elected not to “opt out” of the extended transition related to complying with new or revised accounting standards, which means that when a standard is issued or revised and it has different application dates for public and nonpublic companies, the Company will adopt the newer revised standard at the time nonpublic companies adopt the new or revised standard and will do so until such time that the Company either (i) irrevocably elects to “opt out” of such extended transition period or (ii) no longer qualifies as an emerging growth company. The Company may choose to early adopt any new or revised accounting standards whenever such early adoption is permitted for nonpublic companies.

In June 2016, the FASB issued ASU No. 2016-13, Financial Instruments — Credit Losses (Topic 326) (“ASU 2016-13”). The new standard adjusts the accounting for assets held at amortized costs basis, including marketable securities accounted for as available for sale, and trade receivables. The standard eliminates the probable initial recognition threshold and requires an entity to reflect its current estimate of all expected credit losses. The allowance for credit losses is a valuation account that is deducted from the amortized cost basis of the financial assets to present the net amount expected to be collected. For public business entities except smaller reporting companies, the guidance is effective for annual reporting periods beginning after December 15, 2019 and for interim periods within those fiscal years. For non-public entities and smaller reporting companies, the guidance was effective for annual reporting periods beginning after December 15, 2021. In November 2019, the FASB issued ASU No. 2019-10, which deferred the effective date for non-public entities to annual reporting periods beginning after December 15, 2022, including interim periods within those fiscal years. Early application is allowed. The Company expects to adopt this guidance effective January 1, 2023, and it is currently evaluating the impact on its condensed consolidated financial statements and related disclosures.

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842) (“ASU 2016-02”), which sets out the principles for the recognition, measurement, presentation and disclosure of leases for both parties to a contract (i.e., lessees and lessors). The new standard requires lessees to apply a dual approach, classifying leases as either finance or operating leases based on the principle of whether or not the lease is effectively a financed purchase by the lessee. This classification will determine whether lease expense is recognized based on an effective interest method or on a straight-line basis over the term of the lease. A lessee is also required to record a right-of-use asset and a lease liability for all leases with a term of greater than 12 months regardless of their classification. Leases with a term of 12 months or less may be accounted for similar to existing guidance for operating leases today. For public business entities, ASU 2016-02 is effective for annual reporting periods beginning after December 15, 2018, including interim periods within those fiscal years, and early adoption is permitted.

For nonpublic entities, this guidance is effective for annual periods beginning after December 15, 2021. The Company expects to adopt this guidance effective January 1, 2022, and it is currently evaluating the impact on its condensed consolidated financial statements and related disclosures.

In December 2019, the FASB issued ASU 2019-12, Income Taxes (ASC 740): Simplifying the Accounting for Income Taxes (“ASU 2019-12”), which is intended to simplify various areas related to accounting for income taxes. ASU 2019-12 removes certain exceptions to the general principles in ASC 740 and also clarifies and amends existing guidance to improve consistent application. For public business entities the guidance is effective for annual reporting periods beginning after December 15, 2020 and for interim periods within those fiscal years. For non-public entities, the guidance is effective for annual reporting periods beginning after December 15, 2021 and for interim periods within years beginning after December 15, 2022, with early adoption permitted. The Company expects to adopt this guidance effective January 1, 2022, and it is currently evaluating the impact on its condensed consolidated financial statements and related disclosures.

In August 2020, the FASB issued ASU 2020-06, "Debt — Debt with Conversion and Other Options (Subtopic 470-20)" and "Derivatives and Hedging-Contracts in Entity's Own Equity (Subtopic 815-40): Accounting for Convertible instruments and contracts in an Entity's Own Equity", which simplifies the accounting for certain financial instruments with characteristics of liabilities and equity, including convertible instruments and contracts on an entity's own equity. ASU 2020-06 is effective for the Company for fiscal years beginning after December 15, 2023, and interim periods within those fiscal years. Early adoption is permitted for fiscal years beginning after December 15, 2020, and interim periods within those fiscal years. Adoption is applied on a modified or full retrospective transition approach. The Company is currently evaluating the adoption date and impact, if any, adoption will have on its condensed consolidated financial statements and related disclosures.

3. Fair value of financial assets and liabilities

The following tables present information about the Company's financial assets and liabilities measured at fair value on a recurring basis and indicate the level of the fair value hierarchy used to determine such fair values (in thousands):

	Fair value measurements as of December 31, 2020			
	Level 1	Level 2	Level 3	Total
Assets				
Cash equivalents	$ 23,456	$ —	$ —	$ 23,456
Short-term investments	14,998	—	—	14,998
	$ 38,454	$ —	$ —	$ 38,454
Liabilities				
Preferred stock warrant liability	$ —	$ —	$ 4,117	$ 4,117
	$ —	$ —	$ 4,117	$ 4,117

	Fair value measurements at March 31, 2021			
	Level 1	Level 2	Level 3	Total
Assets				
Cash equivalents	$104,457	$—	$ —	$ 104,457
Short-term investments	5,000	—	—	5,000
	$109,457	$—	$ —	$ 109,457
Liabilities				
Preferred stock warrant liability	$ —	$—	$15,565	$ 15,565
	$ —	$—	$15,565	$ 15,565

During the three months ended March 31, 2021, there were no transfers between Level 1, Level 2 and Level 3.

Valuation of short-term investments

U.S. Treasury bonds were valued by the Company using quoted prices in active markets for similar securities, which represents a Level 1 measurement within the fair value hierarchy.

Valuation of preferred stock warrant liability

The warrant liability is related to the warrants (the "Warrants") to purchase shares of the Company's Series A1, B1, and C1 redeemable convertible preferred stock (see Note 11). The fair value of the warrant liability was determined based on inputs not observable in the market, which represents a Level 3 measurement within the fair value hierarchy.

The Company used the Black-Scholes option-pricing model, which incorporates assumptions and estimates, to value the warrant liability. Key estimates and assumptions impacting the fair value measurement include (i) the

fair value per share of the underlying shares of applicable series of redeemable convertible preferred stock issuable upon exercise of the Warrants, (ii) the remaining contractual term of the Warrants, (iii) the risk-free interest rate, (iv) the expected dividend yield and (iv) expected volatility of the price of the underlying applicable series of redeemable convertible preferred stock. The Company estimated the fair value per share of the underlying applicable series of redeemable convertible preferred stock based, in part, on the results of third-party valuations and additional factors deemed relevant. The risk-free interest rate was determined by reference to the U.S. Treasury yield curve for time periods approximately equal to the remaining contractual term of the Warrants. The Company estimated a zero expected dividend yield based on the fact that the Company has never paid or declared dividends and does not intend to do so in the foreseeable future. As the Company has historically been a private company and lacks company-specific historical and implied volatility information of its stock, the expected stock volatility was based on the historical volatility of publicly traded peer companies for a term equal to the remaining contractual term of the Warrants.

The table below quantifies the weighted average of the unobservable inputs used to fair value the preferred stock warrant liability:

	Three months ended March 31,	
	2020	2021
Fair value of Series A1 preferred stock	$ 0.56	$ 2.51
Fair value of Series B1 preferred stock	$ 1.04	$ 2.88
Fair value of Series C1 preferred stock	*	$ 2.95
Remaining contractual term (in years)	7.3	7.0
Risk-free interest rate	0.6%	1.3%
Expected dividend yield	0%	0%
Expected volatility	39.2%	41.6%

* – Series C1 preferred stock warrant not outstanding at March 31, 2020.

The following table provides a rollforward of the aggregate fair values of the Company's preferred stock warrant liability, for which fair values are determined using Level 3 inputs (in thousands):

	Three months ended March 31,	
	2020	2021
Balance, beginning of period	$ 3,396	$ 4,117
Change in fair value	(5)	11,448
Balance, end of the period	$ 3,391	$ 15,565

Valuation of derivative liability

The derivative liability is related to the conversion option included within the Unsecured Subordinated Convertible Promissory Notes ("Convertible Notes") issued in February 2020 (see Note 9). The Convertible Notes provided a conversion option whereby upon the closing of a specified financing event the Convertible Notes would automatically convert into shares of the same class and series of capital stock of the Company issued to other investors in the financing at a conversion price equal to 80% of the price per share of the securities paid by the other investors. This conversion option was determined to be an embedded derivative required to be bifurcated and accounted for separately from the notes. The fair value of the derivative liability was determined based on inputs not observable in the market, which represents a Level 3 measurement within the fair value hierarchy.

Upon the closing of the Convertible Notes, management determined that the probability of completing the specified financing event was 100%; thus, the value of the automatic conversion option was deemed to be 20% of the fair value of the capital stock to be issued upon conversion of the Convertible Notes, or $2.4 million. This amount represented the fair value of the embedded derivative at issuance (see Note 9).

Upon the occurrence of the specified financing event in April 2020, the Convertible Notes were converted into 10,351,063 shares of Series C1 Preferred Stock, as defined (see Note 9), and the derivative liability of $2.4 million was extinguished.

4. Short-term investments

Short-term investments by investment type consisted of the following (in thousands):

	December 31, 2020			
	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value
US Treasury bonds	$ 14,997	$1	$—	$ 14,998
	$ 14,997	$1	$—	$ 14,998

	March 31, 2021			
	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value
US Treasury bonds	$ 4,999	$1	$—	$ 5,000
	$ 4,999	$1	$—	$ 5,000

5. Inventory

Inventory consisted of the following (in thousands):

	December 31, 2020	March 31, 2021
Raw materials	$ 6,754	$ 7,292
Work in process	1,190	996
Finished goods	1,021	1,489
Total	$ 8,965	$ 9,777

Raw materials, work in process and finished goods are presented net of adjustments to net realizable value of $1.0 million and $0.4 million, as of December 31, 2020 and March 31, 2021, respectively.

6. Prepaid expenses and other current assets

Prepaid expenses and other current assets consisted of the following (in thousands):

	December 31, 2020	March 31, 2021
Prepaid commitment fee	$ 275	$ 210
Prepaid financing fees	62	—
Contract asset	471	461
Deposits	1,148	1,346
Lease receivables, current portion	325	238
Other	839	478
	$ 3,120	$ 2,733

7. Property and equipment, net

Property and equipment, net consisted of the following (in thousands):

	December 31, 2020	March 31, 2021
Manufacturing and laboratory equipment	$ 12,961	$ 13,082
Computer hardware and software	1,088	1,211
Office furniture and fixtures	343	350
Leasehold improvements	2,996	2,996
	17,388	17,639
Less: Accumulated depreciation	(10,336)	(10,680)
	$ 7,052	$ 6,959

Depreciation and amortization expense related to property and equipment was $0.5 million and $0.3 million for the three months ended March 31, 2020 and 2021, respectively. The Company had less than $0.1 million fully depreciated assets disposed of during the year ended December 31, 2020 and none disposed of during the three months ended March 31, 2021.

8. Accrued expenses and other current liabilities

Accrued expenses and other current liabilities consisted of the following (in thousands):

	December 31, 2020	March 31, 2021
Accrued employee compensation and benefits expense	$ 3,083	$ 1,609
Vendor accrual	1,685	2,417
Accrued warranty expense	637	618
Accrued interest	330	784
Deferred rent, current portion	118	121
Accrued taxes	688	704
Other	113	221
	$ 6,654	$ 6,474

9. Long-term debt

The components of the Company's long-term debt consisted of the following (in thousands):

	December 31, 2020	March 31, 2021
Notes Payable	$ 25,000	$ 25,000
Payment in kind interest	1,145	1,145
Less: Unamortized discount	(1,335)	(1,261)
Long-term debt, net of discount	$ 24,810	$ 24,884

Term loan agreements

2018 Term Loan

The Company was required to comply with certain financial and non-financial covenants as defined in the 2018 Term Loan agreement, including a minimum liquidity requirement of the lesser of $7.0 million and the aggregate amount of any revolving indebtedness and outstanding obligations as of any date. In the event this requirement was not met, the Company was subject to a six-month rolling minimum revenue requirement. The Company was in compliance with all financial and non-financial covenants as of March 31, 2020.

The Company repaid the 2018 Term Loan in full in May 2020 using the proceeds from the 2020 Term Loan as discussed below. The Company paid $19.4 million to extinguish the outstanding principal and accrued interest owed, including the non-refundable end-of-term exit fee of $1.3 million (out of which $0.6 million was accrued for in prior years as interest expense) and an early termination fee of $0.1 million.

The loss on extinguishment of debt was $0.8 million which included the write-off of unamortized financing and end-of-term exit fee costs of $0.7 million and $0.1 million in early payment and documentation fees, and was included as a component of other income (expense) in the consolidated statements of operations during the three months ended June 30, 2020. Interest expense on the 2018 Term Loan totaled $0.6 million for three months ended March 31, 2020 which includes amortization of the debt discount of $0.1 million during the three months ended March 31, 2020.

2020 Term Loan

In May 2020, the Company entered into a $60.0 million term loan facility with a new lender (the "2020 Term Loan"), which provides for borrowings of an initial $25.0 million tranche upon closing and options to borrow up to an aggregate of $35.0 million in two additional tranches of $20.0 million under the second tranche (the "Term B Loan") and $15.0 million under the third tranche (the "Term C Loan") subject to certain milestones. The milestone entitling the Company to draw on the Term B Loan is achieved when the Company has received, on a cumulative basis, a predefined number of new system orders during a consecutive twelve month period between January 1, 2020 and November 14, 2021. The milestone entitling the Company to draw down the Term C Loan is achieved when the Company has received, on a cumulative basis, a predefined number of new system orders during a consecutive eighteen month period between January 1, 2020 and May 14, 2022. At closing, the Company issued warrants to purchase 1,195,652 shares of Series C1 Preferred Stock to the lender with an exercise price of $1.15 per share, which were accounted for as debt discount. The Company is obligated to issue additional warrants to the lender with an aggregate exercise value, based on the fair market value of the preferred stock at the time of the draw down, equal to $1.1 million and $0.8 million upon drawing down the Term B Loan and Term C Loan, respectively. The Company paid a $0.8 million facility fee in connection with the term loan facility.

The Company allocated the $0.8 million term loan facility fee on a pro-rata basis based on the amount available to be drawn down under each tranche. The Company allocated $0.3 million to the initial draw, which was recorded within debt issuance cost as an offset to the carrying value of the 2020 Term Loan and amortized over the term of the loan within interest expense on the consolidated statement of operations. Additionally, the Company allocated $0.3 million to the Term B Loan and $0.2 million to the Term C Loan and recorded within prepaid expenses and other current assets on the consolidated balance sheet and amortized on a straight-line basis over the debt access period within interest expense on the consolidated statement of operations.

The 2020 Term Loan agreement includes certain financial and non-financial covenants. These covenants include exceeding certain minimum revenue thresholds on a trailing twelve-month basis, maintaining a minimum balance of $1.5 million in cash and cash equivalents, maintain all inventory in good and marketable condition, and reporting requirements for any material adverse changes in the Company's financial condition. As of March 31, 2021, the Company was in compliance with all covenants under the 2020 Term Loan.

The Company incurred debt issuance costs of $1.5 million in connection with the 2020 Term Loan, including $0.9 million of professional fees and $0.6 million for the fair value of warrants issued with the debt. Interest expense on the 2020 Term Loan totaled $0.9 million for three months ended March 31, 2021, which includes the amortization of the debt discount of $0.1 million. As of December 31, 2020 and March 31, 2021, the unamortized debt discount was $1.3 million for both periods. As of December 31, 2020 and March 31, 2021, accrued interest on the 2020 Term Loan was $0.3 million and $0.8 million, respectively, which is included in accrued expenses and other current liabilities in the consolidated balance sheets.

As of March 31, 2021, the aggregate future principal payments on the Company's outstanding 2020 Term Loan for the next five years were as follows (in thousands):

2021	$ —
2022	—
2023	—
2024	—
2025	26,145
	26,145
Less: Unamortized discount	(1,261)
Long-term debt, net of discount	$24,884

Convertible Notes

In February 2020, the Company issued Convertible Notes to several investors in the aggregate amount of $9.5 million with a stated interest rate of 1.5% per annum and a maturity date of February 28, 2021. The Convertible Notes provided a conversion option whereby upon the closing of a financing event, in which the aggregate gross proceeds of the issuance of preferred stock totaled at least $20.0 million, the notes would automatically convert into shares of the same class and series of capital stock of the Company issued to other investors in the financing at a conversion price equal to 80% of the price per share paid by the other investors. The conversion option met the definition of an embedded derivative and was required to be bifurcated and accounted for separately from the notes. The proceeds from the Convertible Notes were allocated between the derivative liability, with a fair value at issuance of $2.4 million, and the notes, with an initial carrying value of $7.1 million, included in long-term liabilities on the Company's consolidated balance sheets. The difference between the initial carrying value of the notes and the stated value of the notes represented a discount and that was accreted to interest expense over the term of the Convertible Notes using the effective interest method.

In April 2020, the Convertible Notes, including outstanding principal and accrued interest totaling $9.5 million, were automatically converted into 10,351,063 shares of Series C1 Preferred Stock. Upon conversion, the remaining unamortized discount was recognized as loss on extinguishment of debt in the consolidated statement of operations.

Interest expense on the Convertible Notes totaled $0.2 million for three months ended March 31, 2020, which includes amortization of the debt discount of $0.2 million.

10. Redeemable convertible preferred stock

The Company has issued Series A1 redeemable convertible preferred stock (the "Series A1 Preferred Stock"), Series B1 redeemable convertible preferred stock (the "Series B1 Preferred Stock"), Series C1 redeemable convertible preferred stock (the "Series C1 Preferred Stock"), Series C2 redeemable convertible preferred stock (the "Series C2 Preferred Stock"), Series D1 redeemable convertible preferred stock (the "Series D1 Preferred Stock") and Series D2 redeemable convertible preferred stock (the "Series D2 Preferred Stock"). The Series A1 Preferred Stock, Series B1 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock, Series D1 Preferred Stock, and Series D2 Preferred Stock are collectively referred to as the "Preferred Stock".

In April 2020, the Company issued and sold 23,611,208 shares of Series C1 Preferred Stock and 20,301,829 shares of Series C2 Preferred Stock to new and existing investors at a price of $1.15 per share for gross proceeds of $27.2 million and $23.3 million, respectively. Additionally, the Company's Convertible Notes, including outstanding principal and accrued interest totaling $9.5 million (see Note 9), were automatically converted into 10,351,063 shares of Series C1 Preferred Stock. The Company incurred issuance costs in connection with this transaction of $0.6 million and recorded them as a reduction to the carrying value of the Series C1 Preferred Stock and Series C2 Preferred Stock.

In March 2021, the Company issued and sold 22,086,725 shares of Series D1 and 413,268 shares of Series D2 Preferred Stock to new investors and existing investors at a price of $3.60 per share for gross proceeds of $79.5 million and $1.5 million, respectively. The Company incurred issuance costs in connection with this transaction of $1.2 million and recorded them as a reduction to the carrying value of the Series D1 Preferred Stock and Series D2 Preferred Stock.

As of each balance sheet date, the Preferred Stock consisted of the following (in thousands, except for share data):

	December 31, 2020				
	Preferred stock authorized	Preferred stock issued and outstanding	Carrying value	Liquidation preference	Common stock issuable upon conversion
Series A1 Preferred Stock	22,563,639	18,740,115	$ 18,542	$ 21,176	18,740,115
Series B1 Preferred Stock	61,217,425	60,017,425	68,511	90,026	60,017,425
Series C1 Preferred Stock	57,372,796	33,962,271	40,632	58,585	33,962,271
Series C2 Preferred Stock	20,301,829	20,301,829	24,141	35,021	20,301,829
	161,455,689	133,021,640	$ 151,826	$ 204,808	133,021,640

	March 31, 2021				
	Preferred stock authorized	Preferred stock issued and outstanding	Carrying value	Liquidation preference	Common stock issuable upon conversion
Series A1 Preferred Stock	22,563,639	18,740,115	$ 18,836	$ 21,364	18,740,115
Series B1 Preferred Stock	61,217,425	60,017,425	69,340	90,026	60,017,425
Series C1 Preferred Stock	57,372,796	33,962,271	41,299	58,585	33,962,271
Series C2 Preferred Stock	20,301,829	20,301,829	24,539	35,021	20,301,829
Series D1 Preferred Stock	22,499,993	22,086,725	78,349	79,512	22,086,725
Series D2 Preferred Stock	413,268	413,268	1,469	1,487	413,268
	184,368,950	155,521,633	$ 233,832	$ 285,995	155,521,633

The holders of the Preferred Stock have the following rights and preferences:

Voting

The holders of the Preferred Stock, except for Series C2 Preferred Stock and Series D2 Preferred Stock which are non-voting shares, are entitled to vote, together with the holders of common stock voting as a single class, on all matters submitted to the stockholders for a vote. Each holder of Preferred Stock, except for Series C2 Preferred Stock and Series D2 Preferred Stock which are non-voting shares, is entitled to the number of votes equal to the number of shares of common stock into which each share of Preferred Stock is convertible as of the record date for determining stockholders entitled to vote on such matter.

Conversion

Each share Preferred Stock, except for the Series C2 Preferred Stock and Series D2 Preferred Stock, is convertible into shares of common stock at the option of the holder at any time after the date of issuance and without the payment of additional consideration by the holder. Each share of the Series C2/D2 Preferred Stock shall be convertible, at the option of the holder thereof, at any time after the date of issuance, into an equal number of shares of Series C1/D2 Preferred Stock; provided, that, after conversion, each initial holder of Series C2/D2 Preferred Stock would represent less than ten percent of the combined voting power of the Company's outstanding voting securities.

Each share of the Preferred Stock will be mandatorily converted upon the closing of a firm commitment underwritten public offering of the Company's common stock with gross proceeds to the Company of at least $30.0 million and at a price per share of not less than $3.00.

Notwithstanding the previous provision, no shares of Series C2 Preferred Stock or Series D2 Preferred stock shall automatically convert into any other class of capital stock of the Company unless and until the Company has authorized a sufficient number of shares of non-voting common stock to support the conversion of all such shares of Series C2/D2 Preferred stock into non-voting common stock. Upon the sale, assignment, transfer or other disposition of any shares of Series C2/D2 Preferred Stock to a person or entity other than the initial holder of the Series C2/D2 Preferred stock, each such outstanding share of Series C2/D2 Preferred shall be automatically converted into one fully paid and non-assessable share of Series C2 or Series D2 Preferred Stock. Upon the occurrence of a Restriction Removal Event, defined as the holder of Series C2/D2 Preferred stock and the Company submitting a specified U.S. governmental body a notice or declaration concerning the proposed conversion and the governmental body takes no issue or the initial holder of the Series C2/D2 Preferred stock and the Company agree that such filing to with such governmental body is not necessary, each share of Series C2/D2 Preferred Stock then outstanding shall be automatically converted into one fully paid and non-assessable share of Series C1/D2 Preferred stock.

The conversion ratio of each series of Preferred Stock is determined by dividing the Original Issue Price of each series by the Conversion Price of each series. The Original Issue Price per share is $1.00 for Series A1 Preferred Stock, $1.00 for Series B1 Preferred Stock, $1.15 for Series C1 Preferred Stock, $1.15 for Series C2 Preferred Stock, $3.60 for Series D1 Preferred Stock and $3.60 for Series D2 Preferred Stock. The Conversion Price per share is $1.00 for Series A1 Preferred Stock, $1.00 for Series B1 Preferred Stock, $1.15 for Series C1 Preferred Stock, $1.15 for Series C2 Preferred Stock $3.60 for Series D1 Preferred Stock and $3.60 for Series D2 Preferred Stock, each subject to appropriate adjustment in the event of any stock split, stock dividend, combination or other similar recapitalization and other adjustments as set forth in the Company's certificate of incorporation, as amended and restated.

Dividends

From and after the date of issuance, each share of Series A1 Preferred Stock accrues a dividend at the rate of $0.04 per annum. The dividends accrue ratably on a quarterly basis, whether or not declared. The Preferred Stock accruing dividends shall be payable only when, as, and if declared by the Board of Directors and the Company shall be under no obligation to pay such Preferred Stock accruing dividends.

From and after the date of issuance, each share of Series B1 Preferred Stock accrues a dividend at the rate of $0.04 per annum. If the Series B1 Preferred Stock is not redeemed on any of the three eligible annual installments, per the redemption rights, the rate the dividend accrues is increased to $0.10 per share per annum. The dividends accrue ratably on a quarterly basis, whether or not declared. The Preferred Stock accruing dividends shall be payable only when, as, and if declared by the Board of Directors and the Company shall be under no obligation to pay such Preferred Stock accruing dividends.

From and after the date of issuance, each share of Series C1 and Series C2 Preferred Stock accrues a dividend at the rate of $0.046 per annum. If the Series C1 Preferred Stock is not redeemed on any of the three eligible annual installments, per the redemption rights, the rate the dividend accrues is increased to $0.115 per share per annum. The dividends accrue ratably on a quarterly basis, whether or not declared. The Preferred Stock accruing dividends shall be payable only when, as, and if declared by the Board of Directors and the Company shall be under no obligation to pay such Preferred Stock accruing dividends.

The holders of any Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall be entitled to be paid, on an equal basis, the amount due for any accrued dividends before any payment shall be made to the holders of Series A1 Preferred Stock.

The holders of the Series D1 Preferred Stock and Series D2 Preferred Stock are not entitled to accruing dividends.

Through March 31, 2021, no dividends have been declared on any series or class of stock.

Liquidation

In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Company, the holders of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock then outstanding shall be entitled to be paid out of the assets of the Company available for distribution to its stockholders, and before any payment shall be made to the holders of Series A1 Preferred Stock or common stock or any other class or series of capital stock ranking on liquidation junior to the Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock by reason of their ownership thereof, an amount equal to the greater of (i) $3.60 per share for Series D1 Preferred Stock and Series D2 Preferred Stock, $1.725 per share for Series C1 Preferred Stock and Series C2 Preferred Stock and $1.50 per share for Series B1 Preferred Stock, all subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the applicable series of Preferred Stock, and (ii) the sum of (x) the Original Issue Price of the applicable series of Preferred Stock, (y) any accruing dividends accrued but unpaid on the applicable series of Preferred Stock, and (z) any other dividends declared but unpaid on the applicable series of Preferred Stock (the greater of clauses (i) and (ii) for the Series C1 Preferred Stock and Series C2 Preferred Stock, the “Series C Liquidation Preference” and the greater of clauses (i) and (ii) for the Series B1 Preferred Stock, the “Series B1 Liquidation Preference”). If upon any such liquidation, dissolution or winding up of the Company, the assets of the Company available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock the full amount to which they shall be entitled, the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

Following the aforementioned payments to the holders of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock, and before any payment shall be made to the holders of common stock by reason of their ownership thereof, the holders of Series A1 Preferred Stock then outstanding shall be entitled to be paid out of the assets of the Company available for distribution to its stockholders an amount equal to the sum of (x) $1.00 per share, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series A1 Preferred Stock, (y) any accruing dividends accrued but unpaid on the shares of Series A1 Preferred Stock, and (z) any other dividends declared but unpaid on the Series A1 Preferred Stock (the “Series A1 Liquidation Preference” and, together with the Series B1 Liquidation Preference and Series C Liquidation Preference, the “Liquidation Preferences”). If upon any such liquidation, dissolution or winding up of the Company, the assets of the Company available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series A1 Preferred Stock the full amount to which they shall be entitled, the holders of shares of Series A1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

After the payment of the applicable Liquidation Preferences to the holders of Preferred Stock, the assets of the Company available for the distribution to it stockholders shall be distributed among such holders in the following order: (1) the Series A1 Preferred Stock and common stock, pro rata based on the number of shares held by each such holder, on an as-converted basis, until the holders of shares of Series A1 Preferred Stock have received an aggregate per share amount in respect of the Series A1 Preferred Stock equal to the Series B1 Liquidation Preference;(2) among the holders of the Series B1 Preferred Stock, Series A1 Preferred Stock and common stock, pro rata based on the number of shares held by each such holder, on an as-converted basis, until the holders of shares of Series B1 Preferred Stock have received an aggregate per share amount in respect of the Series B1 Preferred Stock equal to the Series C Liquidation Preference; (3) among the holders of the Series C1, Series B1

Preferred Stock, Series A1 Preferred Stock and common stock, pro rata based on the number of shares held by each such holder, on an as-converted basis, until the holders of shares of Series C1 Preferred Stock have received an aggregate per share amount in respect of the Series C1 Preferred Stock equal to the Series D Liquidation Preference; and (4) among the holders of the Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock, Series B1 Preferred Stock, Series A1 Preferred Stock and common stock, pro rata based on the number of shares held by each such holder, on an as-converted basis.

Redemption

Unless otherwise prohibited by Delaware law governing distribution to stockholders, shares of Preferred Stock shall be redeemed by the Company at a price equal to the Liquidation Preference applicable to each series of Preferred Stock in three annual installments commencing not more than 60 days after the receipt by the Company of written notice, at any time on or after the fifth anniversary of the Series D1 original issue date, from the requisite holders, requesting redemption of all shares of Preferred Stock. The Preferred Stock shall be redeemed in the following amounts: one-third of the amount payable based on the Liquidation Preference shall be redeemed on the first installment, 50% of the aggregate amount of the amount unpaid calculated as of the second installment, and the remaining amount due on the third installment. On each installment, holders of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall receive the amounts due based on the respective Liquidation Preferences per share before any payment is made to the holders of Series A1 Preferred Stock.

The Company entered into an agreement with a holder of Series B1 Preferred Stock that includes a special redemption right in the event the Company breaches specified conditions set forth in the agreement, including covenants around specified business activities the Company may participate in, specified business activity ratios and financial ratios related to investments and indebtedness. If the Company breaches the terms of the agreement, and does not cure such breach by the date that is one year following written notice of such breach, such holder of Series B1 Preferred Stock shall have the right to redeem all shares of Preferred Stock outstanding and held by such holder at a price equal to two times the applicable original issue price, plus any applicable dividends accrued but unpaid on such shares of Preferred Stock, plus any other dividends declared but unpaid on such shares of Preferred Stock. In such event, shares of Preferred Stock shall be redeemed by the Company in three annual installments commencing not more than 60 days after the receipt by the Company of written notice, at any time on or after the fifth anniversary of the special redemption date. In the event such holder of Series B1 Preferred Stock requests such special redemption, all other holders of Preferred Stock may elect to participate in such special redemption alongside the holders of Series B1 Preferred Stock. If any holder of Preferred Stock elects not to participate in the special redemption, their shares shall not be redeemed in accordance with the special redemption.

11. Preferred stock warrants

In connection with the 2020 Term Loan, the Company issued 1,195,652 warrants to purchase shares of Series C1 Preferred Stock at an exercise price of $1.15 per share. The Company's warrants were immediately exercisable and expire 10 years after issuance. The fair value of the warrants on the issuance date was $0.7 million. The Company also has outstanding warrants to purchase shares of Preferred Stock issued in connection with previous financing agreements.

As of December 31, 2020 and March 31, 2021, warrants to purchase the following classes of preferred stock outstanding consisted of the following (in thousands, except for share and per share data):

	December 31, 2020					
Issuance date	Contractual term (in years)	Series of redeemable convertible preferred stock	Balance sheet classification	Preferred shares issuable upon exercise of warrant	Weighted average exercise price	Warrant fair value
April 24, 2017	10	Series A1	Liability	3,823,524	$ 0.01	$ 1,875
April 12, 2018	10	Series B1	Liability	1,199,994	$ 0.01	1,501
May 14, 2020	10	Series C1	Liability	1,195,652	$ 1.15	741
				6,219,170		$ 4,117

	March 31, 2021					
Issuance date	Contractual term (in years)	Series of redeemable convertible preferred stock	Balance sheet classification	Preferred shares issuable upon exercise of warrant	Weighted average exercise price	Warrant fair value
April 24, 2017	10	Series A1	Liability	3,823,524	$ 0.01	$ 9,562
April 12, 2018	10	Series B1	Liability	1,199,994	$ 0.01	3,445
May 14, 2020	10	Series C1	Liability	1,195,652	$ 1.15	2,558
				6,219,170		$ 15,565

12. Common stock and common stock warrants

As of December 31, 2020 and March 31, 2021, the Company's amended certificate of incorporation authorized the issuance of 175,000,000 shares and 200,000,000 shares, respectively, of $0.01 par value common stock.

Each share of common stock entitles the holder to one vote on all matters submitted to a vote of the Company's stockholders. The holders of common stock, voting exclusively and as a separate class, are entitled to elect one director of the Company. Common stockholders are entitled to receive dividends, as may be declared by the board of directors, if any, subject to the preferential dividend rights of Preferred Stock. As of March 31, 2020 and 2021, no cash dividends had been declared or paid.

As of December 31, 2020 and March 31, 2021, the Company had reserved 158,227,380 and 187,900,106 shares, respectively, of common stock for the conversion of the outstanding Preferred Stock, exercise of outstanding stock options, the number of shares remaining available for grant under the Company's 2010 Stock Incentive Plan (see Note 13) and the exercise of outstanding warrants to purchase shares of common stock (see Note 11).

In prior years the Company issued warrants to purchase common stock in conjunction with previous financing arrangements. As of December 31, 2020 and March 31, 2021, warrants to purchase the common stock outstanding consisted of the following (in thousands, except for share and per share data):

	December 31, 2020 and March 31, 2021			
Issuance date	Contractual term	Balance sheet classification	Shares of common stock issuable upon exercise of warrant	Weighted average exercise price
	(in years)			
July 24, 2017	10	Equity	129,340	$ 59.03
April 12, 2018	10	Equity	150,000	$ 0.20
			279,340	

13. Stock-based compensation

2010 stock option and grant plan

The Company's 2010 Stock Option and Grant Plan (the "2010 Plan"), provides for the Company to grant incentive stock options or nonqualified stock options, restricted stock awards and other stock-based awards to employees, officers, directors and consultants of the Company.

At December 31, 2020, shares of common stock that may be issued under the 2010 Plan was 24,728,918. In March 2021, the Board of Directors approved an increase to the 2010 Plan shares by 1,914,444 shares. At March 31, 2021, shares of common stock that may be issued under the 2010 Plan was 26,643,362. As of December 31, 2020 and March 31, 2021, 5,327,509 shares and 2,449,687 shares, respectively, remained available for future grant. Shares that are expired, forfeited, canceled or otherwise terminated without having been fully exercised will be available for future grant under the 2010 Plan. In addition, shares of common stock that are tendered to the Company by a participant to exercise an award are added to the number of shares of common stock available for future grants.

The following table presents, on a weighted average basis, the assumptions used in the Black-Scholes option-pricing model to determine the grant-date fair value of stock options granted to employees and directors:

	Three months ended March 31,
	2021
Risk-free interest rate	0.9%
Expected term (in years)	6.0
Expected volatility	44.9%
Expected dividend yield	0%

No options were granted during the three months ended March 31, 2020.

Stock options

The following table summarizes the Company's stock option activity since December 31, 2020 (in thousands, except for share and per share data):

	Number of shares	Weighted average exercise price	Weighted average remaining contractual term	Aggregate intrinsic value
			(in years)	
Outstanding as of December 31, 2020	18,023,065	$ 0.19	8.12	$ 4,272
Granted	4,446,043	1.56		
Exercised	(337,111)	0.21		
Expired	(167,207)	0.20		
Forfeited	(898,190)	0.21		
Outstanding as of March 31, 2021	21,066,600	$ 0.48	8.32	$ 35,672
Options vested and expected to vest as of March 31, 2021	21,066,600	$ 0.48	9.01	$ 18,984
Options exercisable as of March 31, 2021	8,495,015	$ 0.21	8.32	$ 35,672

The aggregate intrinsic value of options is calculated as the difference between the exercise price of the stock options and the fair value of the Company's common stock for those options that had exercise prices lower than the fair value of the Company's common stock.

The intrinsic value of stock options exercised during the three months ended March 31, 2021 was $0.1 million. No stock options were exercised during the three months ended March 31, 2020.

The weighted average grant-date fair value per share of stock options granted during the three months ended March 31, 2021 was and $0.68. No options were granted during the three months ended March 31, 2020.

Restricted stock

In February 2021, the Company granted 1,244,515 shares of restricted stock to an employee with a four-year vesting term. In connection with the grant, the employee paid $0.5 million, which represents the $0.42 per share fair value of the common stock on the date of the restricted stock grant. The restricted common stock includes a repurchase right, whereas upon the occurrence of a specific event, the Company shall have the right to repurchase unvested restricted common stock shares. At December 31, 2020 and March 31, 2021, the Company has zero and $0.5 million in unvested restricted common stock liability included in other long-term liabilities, respectively.

The following table summarizes the Company's restricted stock activity since December 31, 2020 (in thousands except for share and per share data):

	Number of shares	Weighted average fair value
Unvested as of December 31, 2020	—	
Granted	1,244,515	$ 0.42
Vested	—	
Forfeited	—	
Unvested as of March 31, 2021	1,244,515	$ 0.42

Stock-based compensation

Stock-based compensation expense was classified in the consolidated statements of operations as follows (in thousands):

	Three months ended March 31,	
	2020	2021
Cost of revenue	$ 21	$ 29
General and administrative	72	128
Sales and marketing	16	21
Research and development	11	13
Total stock-based compensation expense	$ 120	$ 191

As of March 31, 2021, total unrecognized compensation expense related to unvested stock options held by employees and directors was $3.9 million, which is expected to be recognized over a weighted-average period of 1.58 years.

14. Income taxes

During the three months ended March 31, 2020 and 2021, the Company did not record income tax benefits for the net operating losses incurred or for the research and development tax credits generated in each period, due to its uncertainty of realizing a benefit from those items.

The Company's tax provision and the resulting effective tax rate for interim periods is determined based upon its estimated annual effective tax rate ("AETR"), adjusted for the effect of discrete items arising in that quarter.

The impact of such inclusions could result in a higher or lower effective tax rate during a particular quarter, based upon the mix and timing of actual earnings or losses versus annual projections. In each quarter, the Company

updates its estimate of the annual effective tax rate, and if the estimated annual tax rate changes, a cumulative adjustment is made in that quarter.

The Company has evaluated the positive and negative evidence bearing upon its ability to realize its deferred tax assets, which primarily consist of net operating loss carryforwards. The Company has considered its history of cumulative net losses, estimated future taxable income and prudent and feasible tax planning strategies and has concluded that it is more likely than not that the Company will not realize the benefits of its deferred tax assets. As a result, as of December 31, 2020 and March 31, 2021, the Company has recorded a full valuation allowance against its net deferred tax assets.

The Company files U.S. income tax returns as prescribed by the tax laws of the jurisdictions in which it operates. In the normal course of business, the Company is subject to examination by federal and state jurisdictions, where applicable. There are currently no pending tax examinations in the U.S. The Company has not received notice of examination by any jurisdictions in the U.S.

The Company has a branch in Germany that is under examination in its local country for tax years 2016-2018. Any adjustments that may result from the examinations are not expected to have a material impact on the financial position, liquidity, or results of operations of the Company.

15. Net loss per share

Net loss per share attributable to the common stockholders

Basic and diluted net loss per share attributable to common stockholders was calculated as follow (in thousands, except share and per share amounts):

	Three months ended March 31,	
	2020	2021
Numerator:		
Net loss	$ (8,007)	$ (22,101)
Accretion of redeemable convertible preferred stock to redemption value	(818)	(787)
Cumulative redeemable convertible preferred stock dividends	(788)	(1,411)
Net loss attributable to common stockholders — basic and diluted	$ (9,613)	$ (24,299)
Denominator:		
Weighted average common shares outstanding — basic and diluted	1,767,688	3,207,233
Net loss per share attributable common stockholders — basic and diluted	$ (5.44)	$ (7.58)

The Company's potentially dilutive securities, which include stock options, unvested restricted stock, redeemable convertible preferred stock, common stock warrants and preferred stock warrants, have been excluded from the computation of diluted net loss per share as the effect would be to reduce the net loss per share. Therefore, the weighted average number of common shares outstanding used to calculate both basic and diluted net loss per share attributable to common stockholders is the same. The Company excluded the following potential common shares, presented based on amounts outstanding at each period end, from the computation of diluted net loss per share attributable to common stockholders for the periods indicated because including them would have had an anti-dilutive effect:

	Three months ended March 31,	
	2020	2021
Options to purchase common stock	13,897,028	21,233,705
Unvested restricted common stock	—	1,244,515
Warrants to purchase common stock	279,359	279,340
Redeemable convertible preferred stock (as converted to common stock)	78,757,540	155,521,633
Warrants to purchase preferred stock (as converted to warrants to purchase common stock)	5,023,524	6,219,176
	97,957,451	184,498,369

16. Commitments and contingencies

Lease agreements

In October 2013, the Company entered into an operating lease for office and manufacturing space in in Lowell, Massachusetts, which expires in July 2026. The terms of the lease include options for a one-time, five-year extension of the lease and early termination of the lease in July 2024 as well as a $0.7 million tenant improvement allowance, which was fully utilized as of March 31, 2021.

The Company recognizes rent expense on a straight-line basis over the respective lease period. The Company has recorded deferred rent for rent expense incurred but not yet paid. Rent expense was $0.1 million for each of the three months ended March 31, 2020 and 2021.

Future minimum lease commitments under operating leases as of March 31, 2021 are as follows (in thousands):

Period Ending March 31,	
Remaining 2021	$ 332
2022	454
2023	468
2024	481
2025	494
Thereafter	293
Total	$2,522

Exit fee

In December 2016, in connection with the amendment of a then-outstanding loan agreement with the lender, the Company entered into an agreement under which it is obligated to pay the lender an exit fee in the amount of $0.8 million in the event of a qualifying exit event prior to December 31, 2026. A qualifying event is defined as any (i) liquidation, dissolution or winding up whether voluntary or involuntary; (ii) consolidation, merger or reverse merger; (iii) sale, lease, transfer, exclusive license, exchange, dividend or other disposition of all or substantially all of the Company's assets; (iv) issuance and/or sale of the Company's stock that is greater than 50% of the shares of common stock immediately following such issuance; (v) any other form of acquisition or business combination that results in a change of control at the Company; or (vi) the consummation of any public offering of shares of common stock. There were no amounts accrued for the exit fee as of December 31, 2020 or March 31, 2021, as the occurrence of a qualifying exit event was not deemed probable.

Supply agreement

In March 2020, the Company entered into an agreement with a supplier to provide raw materials used in the manufacturing process. As March 31, 2021, the Company had committed to minimum payments under these arrangements totaling $0.8 million, through December 31, 2022. The Company accrues a liability for such matters

when it is probable that future expenditures will be made and such expenditures can be reasonably estimated. The Company had $0.1 million and less than $0.1 million accrued for the supply agreement as of December 31, 2020 and March 31, 2021, respectively.

Software subscription

During the year ended December 31, 2020, the Company entered into a non-cancelable agreement with a service provider for software as a service and cloud hosting services. As of March 31, 2021, the Company had committed to minimum payments under these arrangements totaling $1.1 million through January 31, 2026. The Company accrues a liability for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated. There were no amounts accrued for the software subscription as of December 31, 2020 and March 31, 2021.

Indemnification agreements

In the ordinary course of business, the Company may provide indemnification of varying scope and terms to customers, vendors, lessors, business partners and other parties with respect to certain matters including, but not limited to, losses arising out of breach of such agreements or from intellectual property infringement claims made by third parties. In addition, the Company has entered into indemnification agreements with members of its board of directors and certain of its executive officers that will require the Company, among other things, to indemnify them against certain liabilities that may arise by reason of their status or service as directors or officers. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is, in many cases, unlimited. To date, the Company has not incurred any material costs as a result of such indemnifications. The Company is not currently aware of any indemnification claims and has not accrued any liabilities related to such obligations in its condensed consolidated financial statements as of December 31, 2020 or March 31, 2021.

Legal proceedings

The Company is not a party to any litigation and does not have contingency reserves established for any litigation liabilities. At each reporting date, the Company evaluates whether or not a potential loss amount or a potential range of loss is probable and reasonably estimable under the provisions of the authoritative guidance that addresses accounting for contingencies. The Company expenses as incurred the costs related to such legal proceedings.

17. Benefit plans

The Company established a defined contribution savings plan under Section 401(k) of the Code. This plan covers all employees who meet minimum age and service requirements and allows participants to defer a portion of their annual compensation on a pre-tax basis. Matching contributions to the plan may be made at the discretion of the Company’s board of directors. The Company made contributions of less than $0.1 million and $0.1 million to the plan during the three months ended March 31, 2020 and 2021, respectively.

18. Subsequent events

For its condensed consolidated financial statements as of March 31, 2021, and for the three months then ended, the Company evaluated subsequent events through May 6, 2021, the date on which those financial statements were issued.

In April 2021, the Company's contract with BARDA was modified resulting in an increase in the contract value of up to $1.0 million, an increase in the cost share reimbursement rate and specification of various developmental milestones.

Events subsequent to original issuance of condensed consolidated financial statements

In June 2021, the Company entered into a Sublease agreement for office and manufacturing space in Lexington, Massachusetts, which expires in June 2029. The Sublease agreement includes an option to terminate the sublease

in July 2026, subject to an early termination fee. Monthly rent payments are fixed and future minimum lease payments over the term of the sublease is $5.6 million. The Company also has the right to use furniture and equipment specified in the Sublease agreement for $0.6 million in future payments over the term of the sublease with the option to purchase the furniture and equipment at the end of the sublease term. Concurrent with entering into the Sublease agreement, the Company executed an Option Agreement with the property owner which provides the Company the option to enter into a new direct lease for the Lexington facility for an additional five-years following expiration of the sublease.

On June 25, 2021, the Company filed an amended and restated certificate of incorporation, which effected recapitalization of the Company's then outstanding common stock to Class A common stock and authorized an additional new class of common stock (Class B common stock). Rights of the holders of Class A common stock and Class B common stock are identical, except with respect to voting and conversion. Additionally, on June 25, 2021, a certain number of investors exchanged Series C1 and D1 Preferred Stock to Series C2 and D2 Preferred Stock.

Shares

Class A common stock

Prospectus

J.P. Morgan **Morgan Stanley** **Cowen** **Stifel**

Prospectus dated , 2021

Part II

Information not required in prospectus

Item 13. Other expenses of issuance and distribution.

The following table indicates the expenses to be incurred in connection with the offering described in this registration statement, other than underwriting discounts and commissions, all of which will be paid by us. All amounts are estimated except the Securities and Exchange Commission registration fee, the Financial Industry Regulatory Authority, Inc., or FINRA, filing fee and the Nasdaq listing fee.

	Amount
Securities and Exchange Commission registration fee	$10,910
FINRA filing fee	15,500
Initial listing fee	*
Accountants' fees and expenses	*
Legal fees and expenses	*
Blue Sky fees and expenses	*
Transfer Agent's fees and expenses	*
Printing and engraving expenses	*
Miscellaneous	*
Total expenses	$ *

* To be filed by amendment.

Item 14. Indemnification of directors and officers.

Section 102 of the General Corporation Law of the State of Delaware permits a corporation to eliminate the personal liability of directors of a corporation to the corporation or its stockholders for monetary damages for a breach of fiduciary duty as a director, except where the director breached his duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of Delaware corporate law or obtained an improper personal benefit. Our restated certificate of incorporation provides that no director of the Registrant shall be personally liable to it or its stockholders for monetary damages for any breach of fiduciary duty as a director, notwithstanding any provision of law imposing such liability, except to the extent that the General Corporation Law of the State of Delaware prohibits the elimination or limitation of liability of directors for breaches of fiduciary duty.

Section 145 of the General Corporation Law of the State of Delaware provides that a corporation has the power to indemnify a director, officer, employee, or agent of the corporation, or a person serving at the request of the corporation for another corporation, partnership, joint venture, trust or other enterprise in related capacities against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with an action, suit or proceeding to which he was or is a party or is threatened to be made a party to any threatened, ending or completed action, suit or proceeding by reason of such position, if such person acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation, and, in any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful, except that, in the case of actions brought by or in the right of the corporation, no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

Our restated certificate of incorporation provides that we will indemnify each person who was or is a party or threatened to be made a party to any threatened, pending or completed action, suit or proceeding (other than an action by or in the right of us) by reason of the fact that he or she is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise (all such persons being referred to as an "Indemnitee"), or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding and any appeal therefrom, if such Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, and, with respect to any criminal action or proceeding, he or she had no reasonable cause to believe his or her conduct was unlawful. Our restated certificate of incorporation provides that we will indemnify any Indemnitee who was or is a party to an action or suit by or in the right of us to procure a judgment in our favour by reason of the fact that the Indemnitee is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise, or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees) and, to the extent permitted by law, amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding, and any appeal therefrom, if the Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, except that no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to us, unless a court determines that, despite such adjudication but in view of all of the circumstances, he or she is entitled to indemnification of such expenses. Notwithstanding the foregoing, to the extent that any Indemnitee has been successful, on the merits or otherwise, he or she will be indemnified by us against all expenses (including attorneys' fees) actually and reasonably incurred in connection therewith. Expenses must be advanced to an Indemnitee under certain circumstances.

We have entered into indemnification agreements with each of our directors and officers. These indemnification agreements may require us, among other things, to indemnify our directors and officers for some expenses, including attorneys' fees, judgments, fines and settlement amounts incurred by a director or officer in any action or proceeding arising out of his or her service as one of our directors or officers, or any of our subsidiaries or any other company or enterprise to which the person provides services at our request.

We maintain a general liability insurance policy that covers certain liabilities of directors and officers of our corporation arising out of claims based on acts or omissions in their capacities as directors or officers.

In any underwriting agreement we enter into in connection with the sale of Class A common stock being registered hereby, the underwriters will agree to indemnify, under certain conditions, us, our directors, our officers and persons who control us within the meaning of the Securities Act of 1933, as amended, or the Securities Act, against certain liabilities.

Item 15. Recent sales of unregistered securities.

Set forth below is information regarding shares of capital stock issued by us within the past three years. Also included is the consideration received by us for such shares and information relating to the section of the Securities Act, or rule of the Securities and Exchange Commission, under which exemption from registration was claimed.

(a) Issuance of capital stock.

From March 2018 through June 2021, the registrant issued an aggregate of (i) 60,017,425 shares of Series B1 preferred stock for an aggregate consideration of approximately $60 million to accredited investors, (ii) 33,962,271 shares of Series C1 preferred stock for an aggregate consideration of approximately $39 million to accredited investors, (iii) 20,301,829 shares of Series C2 preferred stock for an aggregate consideration of approximately $23.3 million to accredited investors, (iv) 22,086,725 shares of Series D1 preferred stock for an aggregate consideration of approximately $79.5 million to accredited investors and (v) 413,268 shares of Series D2

preferred stock for an aggregate consideration of approximately $1.5 million to accredited investors, each pursuant to Rule 506 as a transaction not involving a public offering.

(b) Equity grants.

From April 2018 through June 2021, the registrant granted stock options to purchase an aggregate of 26,817,004 shares of its Class A common stock with exercise prices ranging between $0.15 and $2.72 per share.

Since April 2018, the registrant has issued an aggregate of 1,983,867 shares of Class A common stock pursuant to stock options exercised by certain of its employees and consultants in connection with services provided to the registrant by such parties, with exercise prices ranging between $0.15 and $2.17 per share.

From April 2018 through June 2021, the registrant granted an aggregate of 1,244,515 restricted stock awards to its employee in connection with services provided to the registrant by such party at a price of $0.42 per share.

The securities listed above were issued pursuant to written compensatory plans or arrangements with our employees, directors and consultants, in reliance on the exemption provided by Rule 701 promulgated under the Securities Act, or pursuant to Section 4(a)(2) under the Securities Act, relative to transactions by an issuer not involving any public offering, to the extent an exemption from such registration was required.

(c) Warrants.

In May 2020, the registrant issued a warrant to purchase up to an aggregate of 1,195,652 shares of Series C1 preferred stock to an accredited investor pursuant to Section 4(a)(2) of the Securities Act as a transaction not involving a public offering.

Item 16. Exhibits and financial statement schedules.

(a) Exhibits.

Exhibit number	Description of exhibit
1.1*	Form of Underwriting Agreement
3.1	Certificate of Incorporation of the Registrant, as amended (currently in effect)
3.2	Bylaws of the Registrant (currently in effect)
3.3*	Form of Restated Certificate of Incorporation of the Registrant (to be effective upon the closing of this offering)
3.4*	Form of Amended and Restated Bylaws of the Registrant (to be effective upon the closing of this offering)
4.1	Specimen Stock Certificate evidencing the shares of Class A common stock
4.2	Forms of Common Stock Warrant Agreement
4.3	Form of Series A1 Warrant Agreement
4.4	Form of Series B1 Warrant Agreement
4.5	Form of Series C1 Warrant Agreement
5.1*	Opinion of Latham & Watkins LLP
10.1	2010 Stock Option and Grant Plan, as amended, and forms of award agreements thereunder
10.2*	2021 Incentive Award Plan and forms of award agreements thereunder
10.3*	2021 Employee Stock Purchase Plan
10.4*	Non-Employee Director Compensation Program
10.5	Seventh Amended and Restated Investors' Rights Agreement
10.6*	Form of Indemnification Agreement for Directors and Executive Officers

Exhibit number	Description of exhibit
10.7	Lease Agreement, dated October 21, 2013, by and between the Registrant and Farley White Pawtucket, LLC, as amended
10.8	Sublease, dated June 8, 2021, by and between the Registrant and National Medical Care, Inc.
10.9*	Employment Agreement, dated September 26, 2014, by and between the Registrant and Robert Spignesi
10.10*	Offer Letter, dated August 9, 2018, by and between the Registrant and Sean Wirtjes
10.11*	Offer Letter, dated November 5, 2020, by and between the Registrant and John Wilson
10.12*	Offer Letter, dated August 5, 2020, by and between the Registrant and Victoria Vezina
10.13*	Offer Letter, dated May 3, 2021, by and between the Registrant and Jonathan Paris
10.14†	License Agreement, dated May 13, 2013, by and between the Registrant and Thermo CRS, Ltd.
10.15	Loan and Security Agreement, dated May 14, 2020, among the Registrant, Kennedy Lewis Capital Partners Master Fund II LP, as lender, and Kennedy Lewis Management LP, as collateral agent
21.1	Subsidiaries of the Registrant
23.1	Consent of PricewaterhouseCoopers LLP
23.2*	Consent of Latham & Watkins LLP (included in Exhibit 5.1)
23.3	Consent of Health Advances LLC
24.1	Power of Attorney (included on signature page)

* To be filed by amendment.

† Portions of this exhibit (indicated by asterisks) have been redacted in compliance with Regulation S-K Item 601(b)(10)(iv).

(b) Financial Statement Schedules. Schedules not listed above have been omitted because the information required to be set forth therein is not applicable or is shown in the financial statements or notes thereto.

Item 17. Undertakings.

The undersigned registrant hereby undertakes to provide to the underwriter, at the closing specified in the underwriting agreement, certificates in such denominations and registered in such names as required by the underwriter to permit prompt delivery to each purchaser.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

The undersigned hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act of 1933, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(2) For the purpose of determining any liability under the Securities Act of 1933, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

Signatures

Pursuant to the requirements of the Securities Act, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Lowell, Commonwealth of Massachusetts, on this 25th day of June, 2021.

RAPID MICRO BIOSYSTEMS, INC.

By: /s/ Robert Spignesi

Robert Spignesi
President and Chief Executive Officer

Signatures and power of attorney

We, the undersigned officers and directors of Rapid Micro Biosystems, Inc., hereby severally constitute and appoint Robert Spignesi and Sean Wirtjes, and each of them singly (with full power to each of them to act alone), our true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them for him and in his or her name, place and stead, and in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement (or any other registration statement for the same offering that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act of 1933), and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as full to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or any of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement has been signed by the following persons in the capacities held on the dates indicated.

Signature	Title	Date
/s/ Robert Spignesi Robert Spignesi	President, Chief Executive Officer and Director (principal executive officer)	June 25, 2021
/s/ Sean Wirtjes Sean Wirtjes	Chief Financial Officer (principal financial officer and principal accounting officer)	June 25, 2021
/s/ Jeffrey Schwartz Jeffrey Schwartz	Chairperson of the Board of Directors	June 25, 2021
/s/ Bruce Cohen Bruce Cohen	Director	June 25, 2021
/s/ David Hirsch David Hirsch, M.D., Ph.D.	Director	June 25, 2021
/s/ Richard Kollender Richard Kollender	Director	June 25, 2021

Signature	Title	Date
/s/ Melinda Litherland Melinda Litherland	Director	June 25, 2021
/s/ Natale Ricciardi Natale Ricciardi	Director	June 25, 2021
/s/ Alexander Schmitz Alexander Schmitz	Director	June 25, 2021

Exhibit 3.1

NINTH AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
RAPID MICRO BIOSYSTEMS, INC.

(Pursuant to Sections 242 and 245 of the
General Corporation Law of the State of Delaware)

Rapid Micro Biosystems, Inc., a corporation organized and existing under and by virtue of the provisions of the General Corporation Law of the State of Delaware (the "**General Corporation Law**"),

DOES HEREBY CERTIFY:

1. That the name of this corporation is Rapid Micro Biosystems, Inc., and that this corporation was originally incorporated pursuant to the General Corporation Law on December 29, 2006 under the name Rapid Micro Biosystems, Inc. An Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on July 1, 2009. A Second Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on June 25, 2013. A Third Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on April 1, 2014. A Fourth Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on April 21, 2015. A Certificate of Amendment to the Fourth Amended and Restated Certificate of Incorporation was filed on August 3, 2015. A Certificate of Amendment to the Fourth Amended and Restated Certificate of Incorporation was filed on March 3, 2016. A Certificate of Amendment to the Fourth Amended and Restated Certificate of Incorporation was filed effective as of July 24, 2017. A Fifth Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on July 24, 2017. A Sixth Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on April 11, 2018. A Seventh Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on April 28, 2020. A Certificate of Amendment to the Seventh Amended and Restated Certificate of Incorporation was filed on May 14, 2020. An Eighth Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on March 9, 2021.

2. That the Board of Directors of this corporation duly adopted resolutions proposing to amend and restate the Eighth Amended and Restated Certificate of Incorporation of this corporation, declaring said amendment and restatement to be advisable and in the best interests of this corporation and its stockholders, and authorizing the appropriate officers of this corporation to solicit the consent of the stockholders therefor, which resolution setting forth the proposed amendment and restatement is as follows:

RESOLVED, that the Eighth Amended and Restated Certificate of Incorporation of this corporation be amended and restated in its entirety to read as follows:

FIRST: The name of this corporation is Rapid Micro Biosystems, Inc. (the "**Corporation**").

SECOND: The address of the registered office of the Corporation in the State of Delaware is Corporation Trust Center, 1209 Orange Street, in the City of Wilmington, County of New Castle, 19801. The name of its registered agent at such address is The Corporation Trust Company.

THIRD: The nature of the business or purposes to be conducted or promoted is to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law.

FOURTH: The total number of shares of all classes of stock which the Corporation shall have authority to issue is 430,774,617, consisting of (i) 234,516,907 shares of Common Stock, $0.01 par value per share ("**Common Stock**"), and (ii) 196,257,710 shares of Preferred Stock, $0.01 par value per share ("**Preferred Stock**").

The following is a statement of the designations and the powers, privileges and rights, and the qualifications, limitations or restrictions thereof in respect of each class of capital stock of the Corporation.

A. COMMON STOCK

200,000,000 of the authorized shares of Common Stock of the Corporation are hereby designated "**Class A Common Stock**" and 34,516,907 of the authorized shares of Common Stock of the Corporation are hereby designated "**Class B Common Stock**", in each case with the following rights, preferences, powers, privileges, restrictions, qualifications and limitations. Immediately upon the effectiveness of this Certificate of Incorporation (the "**Effective Time**"), each share of the Corporation's Common Stock issued and outstanding or held as treasury stock immediately prior to the Effective Time shall, automatically and without further action by any holder, be reclassified as, and shall become, one share of Class A Common Stock. Any stock certificate that immediately prior to the Effective Time represented shares of the Corporation's Common Stock shall from and after the Effective Time be deemed to represent shares of Class A Common Stock, without the need for surrender or exchange thereof.

1. General. The voting, dividend and liquidation rights of the holders of the Common Stock are subject to and qualified by the rights, powers and preferences of the holders of the Preferred Stock set forth herein.

2. Voting.

2.1 The holders of the Class A Common Stock are entitled to one vote for each share of Class A Common Stock held at all meetings of stockholders (and written actions in lieu of meetings); provided, however, that, except as otherwise required by law, holders of Class A Common Stock, as such, shall not be entitled to vote on any amendment to the Certificate of Incorporation that relates solely to the terms of one or more outstanding series of Preferred Stock if the holders of such affected series are entitled, either separately or together with the holders of one or more other such series, to vote thereon pursuant to the Certificate of Incorporation or pursuant to the General Corporation Law. There shall be no cumulative voting. The number of authorized shares of Common Stock or any class thereof may be increased or decreased (but not below the number of shares thereof then outstanding) by (in addition to any vote of the holders of one or more series of Preferred Stock that may be required by the terms of the Certificate of Incorporation) the affirmative vote of the holders of shares of capital stock of the Corporation representing a majority of the votes represented by all outstanding shares of capital stock of the Corporation entitled to vote, irrespective of the provisions of Section 242(b)(2) of the General Corporation Law.

2.2 Except as otherwise required by the General Corporation Law or as set forth in the following sentence, the Class B Common Stock shall have no voting rights and shall not entitle the holders thereof to any vote at any meeting of stockholders, or in connection with any written consent of stockholders, with respect to any matter, and the shares of Class B Common Stock shall not be considered present or entitled to vote or otherwise accounted for in connection with any meeting or vote that occurs during such time (including for purposes of determining the presence or absence of a quorum or the minimum vote required to approve any matter). However, as long as any shares of Class B Common Stock are outstanding, without the affirmative vote or written consent of the holders of a majority of the then outstanding shares of the Class B Common Stock, the Corporation shall not, directly or indirectly, whether by or through any subsidiary and whether by merger, consolidation or otherwise, amend, modify or repeal any provision of the Certificate of Incorporation if the effect thereof would be to modify the voting, conversion or other rights, powers, preferences, privileges or restrictions of the Class B Common Stock.

3. Conversion of Class B Common Stock.

3.1 Conversion at Option of Holder. Each share of Class B Common Stock shall be convertible, at any time and from time to time from and after the date of issuance, at the option of the holder thereof, into one share of Class A Common Stock. A holder of Class B Common Stock shall effect conversions by providing the Corporation with written notice that such holder elects to convert all or any number of the shares of Class B Common Stock held by such holder (a "**Class B Notice of Conversion**"). The close of business on the date of receipt by the transfer agent (or by the Corporation if the Corporation serves as its own transfer agent) of such Class B Notice of Conversion shall be the time of conversion (the "**Class B Conversion Time**") and the shares of Class A Common Stock issuable upon conversion of such shares of Class B Common Stock shall be deemed to be outstanding of record as of such date. The Corporation shall, as soon as practicable after the Class B Conversion Time, issue and deliver to such holder of Class B Common Stock, or to his, her or its nominees, a certificate or certificates for the number of full shares of Class A Common Stock issuable upon such conversion in accordance with the provisions hereof and a book-entry statement evidencing the number (if any) of the shares of Class B Common Stock that were not converted into Class A Common Stock.

3.2 Beneficial Ownership Limitation. Notwithstanding anything herein to the contrary, but subject to the second to last sentence of this Subsection 3.2, the Corporation shall not effect any conversion of the Class B Common Stock, and a holder shall not have the right to convert any portion of the Class B Common Stock, to the extent that, after giving effect to an attempted conversion set forth in the applicable Notice of Conversion, such holder together with any Person whose beneficial ownership of Class A Common Stock would be aggregated with such holder's for purposes of Section 13(d) of the Exchange Act and the applicable rules and regulations of the Securities and Exchange Commission (the "**Commission**"), including any "group" of which the holder is a member would beneficially own a number of shares of Class A Common Stock in excess of 4.9% of the total number of shares of Class A Common Stock then issued and outstanding (the "**Beneficial Ownership Limitation**"); provided that the Beneficial Ownership Limitation shall not apply to the extent that the Class A Common Stock is not deemed to constitute an "equity security" pursuant to Rule 13d-1(i) under the Exchange Act. Delivery of a Notice of Conversion by a holder in respect of the conversion of Class B Common Stock shall constitute a representation by such holder that the issuance of shares of Class A Common Stock in accordance with such Notice of Conversion will not cause such holder (together with any Person whose beneficial ownership of Class A Common Stock would be aggregated with such holder's for purposes of Section 13(d) of the Exchange Act and the applicable regulations of the Commission (as defined below)) to beneficially own a number of shares of Class A Common Stock in excess of the Beneficial Ownership Limitation, as determined in accordance with this Certificate of Incorporation. For purposes of this Subsection 3.2, the number of shares of Class A Common Stock beneficially owned by such holder shall include the number of shares of Class A Common Stock issuable upon conversion of the Class B Common Stock subject to the Notice of Conversion with respect to which such determination is being made, but shall exclude the number of shares of Class A Common Stock which are issuable upon (A) conversion of the remaining, unconverted Class B Common Stock beneficially owned by such holder (and any Person whose beneficial ownership of Class A Common Stock would be aggregated with such holder's for purposes of Section 13(d) of the Exchange Act and the applicable regulations of the Commission), and (B) exercise, exchange or conversion of the unexercised, unexchanged or unconverted portion of any other securities of the Corporation subject to a limitation on conversion, exchange or exercise analogous to the limitation contained herein (including any class or series of preferred stock and warrants) beneficially owned by such holder (and any Person whose beneficial ownership of Class A Common Stock would be aggregated with such holder's for purposes of Section 13(d) of the Exchange Act and the applicable regulations of the Commission). Except as set forth in the preceding sentence, for purposes of this Subsection 3.2, beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. In addition, a determination as to any "group" status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Subsection 3.2, in determining the number of outstanding shares of Class A Common Stock, a holder may rely on the number of outstanding shares of Class A Common Stock as stated in the Corporation's most recent quarterly or annual report filed with the Commission, any current report or other filing filed by the Corporation with the Commission subsequent thereto or any confirmation provided by the Corporation in accordance with the next sentence. Upon the written request of a holder (which may be via electronic mail), the Corporation shall promptly following such request, confirm in writing via electronic mail to such holder the number of shares of Class A Common Stock then outstanding. In any case, the number of outstanding shares of Class A Common Stock shall be determined after giving effect to any actual conversion, exchange or exercise of securities of the Corporation, including Class B Common Stock, by such holder (and any Person whose beneficial ownership of Class A Common Stock would be aggregated with such holder's for purposes of Section 13(d) of the Exchange Act and the applicable regulations of the Commission) since the date as of which such number of outstanding shares of Class A Common Stock was last publicly reported. Notwithstanding anything herein to the contrary, in the event of an error in the Notice of Conversion that would result in the holder beneficially owning shares of Class A Common Stock in excess of the Beneficial Ownership Limitation, then such Notice of Conversion shall only be effective with respect to that number of shares of Class A Common Stock that would not result in the holder exceeding the Beneficial Ownership Limitation.

3.3 Automatic Conversion Upon Certain Transfers. Upon a transfer of shares of Class B Common Stock by a holder to a Person that is neither an Affiliate of such holder nor a Person whose beneficial ownership of Class A Common Stock would be aggregated with such holder's for purposes of Section 13(d) of the Exchange Act and the applicable regulations of the Commission (a "Permitted Transferee"), each share of Class B Common Stock so transferred shall automatically, without further action by the transferor or Permitted Transferee, convert into a share of Class A Common Stock; and upon delivery to the Corporation of written notice from the transferor of any such transfer, the Corporation shall issue and deliver the shares of Class A Common Stock into which such transferred shares of Class B Common Stock shall have thereby converted, with the same effect as if such notice of transfer were a Class B Notice of Conversion delivered in accordance with Subsection 3.1. For purposes of this Subsection 3.3, a transfer of Class B Common Stock shall be deemed to have occurred when the Permitted Transferee has delivered the agreed consideration for such shares to the transferor. The written notice of transfer to be delivered to the Corporation in accordance with this Subsection 3.3 shall be deemed a representation by the transferor that it has received such consideration, and the Corporation shall be entitled to rely upon such representation.

3.4 Reservation of Shares. The Corporation shall at all times when any shares of Class B Common Stock shall be outstanding, reserve and keep available out of its authorized but unissued capital stock, for the purpose of effecting the conversion of Class B Common Stock, such number of its duly authorized shares of Class A Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding Class B Common Stock; and if at any time the number of authorized but unissued shares of Class A Common Stock shall not be sufficient to effect the conversion of all then outstanding shares of Class B Common Stock, the Corporation shall take such corporate action as may be necessary to increase its authorized but unissued shares of Class A Common Stock to such number of shares as shall be sufficient for such purposes, including, without limitation, engaging in best efforts to obtain the requisite stockholder approval of any necessary amendment to the Certificate of Incorporation.

3.5 Effect of Conversion. All shares of Class B Common Stock which shall have been surrendered for conversion as herein provided shall no longer be deemed to be outstanding and all rights with respect to such shares shall immediately cease and terminate on the Class B Conversion Date, except only the right of the holders thereof to receive shares of Class A Common Stock in exchange therefor. Any shares of Class B Common Stock so converted shall be retired and cancelled and may not be reissued, and the Corporation may thereafter take such appropriate action (without the need for stockholder action) as may be necessary to reduce the authorized number of shares of Class B Common Stock accordingly.

3.6 Taxes. The Corporation shall pay any and all issue and other similar taxes that may be payable in respect of any issuance or delivery of shares of Class A Common Stock upon conversion of shares of Class B Common Stock pursuant to this Section 3. The Corporation shall not, however, be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of shares of Class A Common Stock in a name other than that in which the shares of Class B Common Stock so converted were registered, and no such issuance or delivery shall be made unless and until the person or entity requesting such issuance has paid to the Corporation the amount of any such tax or has established, to the satisfaction of the Corporation, that such tax has been paid.

3.7 Certain Defined Terms. For the purposes of this Section 3, the following terms shall have the following meanings:

(a) "**Affiliate**" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 144. For this purpose, "control" (including, with its correlative meanings, "controlled by" and "under common control with") shall mean the possession, directly or indirectly, of the power to direct or cause the direction of management or policies of a Person, whether through the ownership of securities or partnership or other ownership interests, by contract or otherwise. With respect to a holder of capital stock, any investment fund or managed account that is managed on a discretionary basis by the same investment manager as such holder will be deemed to be an Affiliate of such holder.

(b) "**Person**" means any individual, sole proprietorship, partnership (general or limited), limited liability company, joint venture, company, trust (statutory or common law), unincorporated organization, association, corporation, institution, public benefit corporation, firm, joint stock company, estate, entity or governmental or regulatory agency.

4. Redemption. The Common Stock is not redeemable at the option of the holder.

5. Dividends. Subject to the prior rights of holders of all classes of stock at the time outstanding having prior rights as to dividends, the holders of the Common Stock shall be entitled to receive, when, as and if declared by the Board of Directors of the Corporation (the "**Board of Directors**"), out of any assets of the Corporation legally available therefor, any dividends as may be declared from time to time by the Board of Directors.

B. PREFERRED STOCK

22,563,639 of the authorized shares of Preferred Stock of the Corporation are hereby designated "**Series A1 Preferred Stock**", 61,217,419 of the authorized shares of Preferred Stock of the Corporation are hereby designated "**Series B1 Preferred Stock**", 55,459,752 of the authorized shares of Preferred Stock of the Corporation are hereby designated "**Series C1 Preferred Stock**", 31,739,130 of the authorized shares of Preferred Stock of the Corporation are hereby designated "**Series C2 Preferred Stock**", 22,499,993 of the authorized shares of Preferred Stock of the Corporation are hereby designated "**Series D1 Preferred Stock**", and 2,777,777 of the authorized shares of Preferred Stock of the Corporation are hereby designated "**Series D2 Preferred Stock**", in each case with the following rights, preferences, powers, privileges, restrictions, qualifications and limitations. Unless otherwise indicated, references to "Sections" or "Subsections" in this Part B of this Article Fourth refer to sections and subsections of Part B of this Article Fourth.

1. Dividends.

1.1 From and after the date of issuance of any shares of Series A1 Preferred Stock, dividends at the rate per annum of $0.04 per share shall accrue on such shares of Series A1 Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series A1 Preferred Stock) (the "**Series A1 Accruing Dividends**"). The Series A1 Accruing Dividends shall accrue ratably on a quarterly basis, whether or not declared; provided however, that except as set forth in Subsection 1.5, Section 2 and Section 6, such Series A1 Accruing Dividends shall be payable only when, as, and if declared by the Board of Directors and the Corporation shall be under no obligation to pay such Series A1 Accruing Dividends.

1.2 From and after the date on which the first share of Series B1 Preferred Stock was issued, dividends at the rate per annum of $0.04 per share shall accrue on such shares of Series B1 Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series B1 Preferred Stock) (the "**Series B1 Accruing Dividends**"). Notwithstanding the foregoing, if the Series B1 Preferred Stock is not redeemed by the Corporation on the General Redemption Date (as defined below) following the delivery of a General Redemption Request (as defined below) for any reason, then the Series B1 Accruing Dividends shall automatically be increased to $0.10 per share of Series B1 Preferred Stock per annum (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series B1 Preferred Stock) until such time as the Series B1 Preferred Stock has been redeemed in full by the Corporation. The Series B1 Accruing Dividends shall accrue ratably on a quarterly basis, whether or not declared; provided however, that except as set forth in Subsection 1.5, Section 2 and Section 6, such Series B1 Accruing Dividends shall be payable only when, as, and if declared by the Board of Directors and the Corporation shall be under no obligation to pay such Series B1 Accruing Dividends, subject to such payments having been ratified by the Board of Directors at the time of declaration, payment or set aside, as applicable (including by the approval of the Board of Directors of such payment).

1.3 From and after the date on which the first share of Series C1 Preferred Stock was issued (the "**Series C1 Original Issue Date**"), dividends at the rate per annum of $0.046 per share shall accrue on the shares of Series C1 Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series C1 Preferred Stock) (the "**Series C1 Accruing Dividends**"). Notwithstanding the foregoing, if the Series C1 Preferred Stock is not redeemed by the Corporation on the General Redemption Date following the delivery of a General Redemption Request for any reason, then the Series C1 Accruing Dividends shall automatically be increased to $0.115 per share of Series C1 Preferred Stock per annum (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series C1 Preferred Stock) until such time as the Series C1 Preferred Stock has been redeemed in full by the Corporation. The Series C1 Accruing Dividends shall accrue ratably on a quarterly basis, whether or not declared; provided however, that except as set forth in Subsection 1.5, Section 2 and Section 6, such Series C1 Accruing Dividends shall be payable only when, as, and if declared by the Board of Directors and the Corporation shall be under no obligation to pay such Series C1 Accruing Dividends, subject to such payments having been ratified by the Board of Directors at the time of declaration, payment or set aside, as applicable (including by the approval of the Board of Directors of such payment).

1.4 From and after the Series C1 Original Issue Date, dividends at the rate per annum of $0.046 per share shall accrue on the shares of Series C2 Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series C2 Preferred Stock) (the "**Series C2 Accruing Dividends**" and, together with the Series A1 Accruing Dividends, the Series B1 Accruing Dividends and the Series C1 Accruing Dividends, the applicable "**Accruing Dividends**"). Notwithstanding the foregoing, if the Series C2 Preferred Stock is not redeemed by the Corporation on the General Redemption Date following the delivery of a General Redemption Request for any reason, then the Series C2 Accruing Dividends shall automatically be increased to $0.115 per share of Series C2 Preferred Stock per annum (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series C2 Preferred Stock) until such time as the Series C2 Preferred Stock has been redeemed in full by the Corporation. The Series C2 Accruing Dividends shall accrue ratably on a quarterly basis, whether or not declared; provided however, that except as set forth in Subsection 1.5, Section 2 and Section 6, such Series C2 Accruing Dividends shall be payable only when, as, and if declared by the Board of Directors and the Corporation shall be under no obligation to pay such Series C2 Accruing Dividends, subject to such payments having been ratified by the Board of Directors at the time of declaration, payment or set aside, as applicable (including by the approval of the Board of Directors of such payment).

1.5 The Corporation shall not declare, pay or set aside any dividends on shares of any other class or series of capital stock of the Corporation (other than dividends on shares of Common Stock payable in shares of Common Stock) unless (in addition to obtaining any consents required elsewhere in the Certificate of Incorporation): (i) first, the holders of Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock then outstanding shall receive, or simultaneously receive, on a pari passu basis, a dividend on each outstanding share of Series C1 Preferred Stock, Series C2 Preferred Stock or Series B1 Preferred Stock, respectively, in an amount equal to the amount of the aggregate Series C1 Accruing Dividends, Series C2 Accruing Dividends or Series B1 Accruing Dividends, respectively, then accrued on such applicable share and not previously paid; and (ii) second, after payment in full of the dividends referred to in clause (i) hereof, the holders of Series A1 Preferred Stock then outstanding shall receive, or simultaneously receive, a dividend on each outstanding share of Series A1 Preferred Stock in an amount equal to the amount of the aggregate Series A1 Accruing Dividends then accrued on such share of Series A1 Preferred Stock and not previously paid. After payment of the dividends in the preceding sentence, any additional dividends or distributions shall be distributed among all holders of Common Stock and Preferred Stock in proportion to the number of shares of Common Stock that would be held by each such holder if all shares of Preferred Stock were converted to Class A Common Stock at the then effective conversion rate.

2. Liquidation, Dissolution or Winding Up; Certain Mergers, Consolidations and Asset Sales.

2.1 Payments to Holders of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock.

2.1.1 Payments to Holders of Series D1 Preferred Stock. In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the holders of shares of Series D1 Preferred Stock then outstanding shall be entitled to be paid out of the assets of the Corporation available for distribution to its stockholders, on a pari passu basis with the payment of the Series D2 Liquidation Preference to the holders of Series D2 Preferred Stock pursuant to Subsection 2.1.2, the payment of the Series C1 Liquidation Preference to the holders of shares of Series C1 Preferred Stock pursuant to Subsection 2.1.3, the payment of the Series C2 Liquidation Preference to the holders of shares of Series C2 Preferred Stock pursuant to Subsection 2.1.4, and the payment of the Series B1 Liquidation Preference to the holders of shares of Series B1 Preferred Stock pursuant to Subsection 2.1.5, but before any payment shall be made to the holders of Series A1 Preferred Stock or Common Stock or any other class or series of capital stock ranking on liquidation junior to the Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock by reason of their ownership thereof, an amount per share equal to the greater of (i) $3.60, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series D1 Preferred Stock (the "**Series D1 Original Issue Price**"), plus any dividends declared but unpaid on the Series D1 Preferred Stock, and (ii) such amount per share of Series D1 Preferred Stock as would have been payable in respect of each share of Series D1 Preferred Stock had each share of Series D1 Preferred Stock converted into Class A Common Stock pursuant to Section 4 immediately prior to such liquidation, dissolution, winding up or Deemed Liquidation Event (the greater of clauses (i) and (ii), the "**Series D1 Liquidation Preference**"); provided that if any such payments require approval by the Board of Directors (the "**Series D1 Qualified Payments**"), then such Series D1 Qualified Payments shall have been ratified by the Board of Directors at the time of declaration, payment or set aside, as applicable (including by the approval of the Board of Directors of such payment), and in any event such Series D1 Qualified Payments shall be made pursuant to and in accordance with this Subsection 2.1.1 of the Certificate of Incorporation, which has been approved by the Board of Directors, and any amendments or changes to this Subsection 2.1.1 shall require, in addition to any stockholder approval required under the Certificate of Incorporation, the approval of the Board of Directors. If upon any such liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series D1 Preferred Stock the full amount to which they shall be entitled under this Subsection 2.1.1, the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

2.1.2 Payments to Holders of Series D2 Preferred Stock. In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the holders of shares of Series D2 Preferred Stock then outstanding shall be entitled to be paid out of the assets of the Corporation available for distribution to its stockholders, on a pari passu basis with the payment of the Series D1 Liquidation Preference to the holders of Series D1 Preferred Stock pursuant to Subsection 2.1.1, the payment of the Series C1 Liquidation Preference to the holders of shares of Series C1 Preferred Stock pursuant to Subsection 2.1.3, the payment of the Series C2 Liquidation Preference to the holders of shares of Series C2 Preferred Stock pursuant to Subsection 2.1.4, and the payment of the Series B1 Liquidation Preference to the holders of shares of Series B1 Preferred Stock pursuant to Subsection 2.1.5, but before any payment shall be made to the holders of Series A1 Preferred Stock or Common Stock or any other class or series of capital stock ranking on liquidation junior to the Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock by reason of their ownership thereof, an amount per share equal to the greater of (i) $3.60, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series D2 Preferred Stock (the "**Series D2 Original Issue Price**"), plus other dividends declared but unpaid on the Series D2 Preferred Stock, and (ii) such amount per share of Series D2 Preferred Stock as would have been payable in respect of each share of Series D2 Preferred Stock had each share of Series D2 Preferred Stock converted into Class A Common Stock pursuant to Section 4 immediately prior to such liquidation, dissolution, winding up or Deemed Liquidation Event (the greater of clauses (i) and (ii), the "**Series D2 Liquidation Preference**"); provided that if any such payments require approval by the Board of Directors (the "**Series D2 Qualified Payments**"), then such Series D2 Qualified Payments shall have been ratified by the Board of Directors at the time of declaration, payment or set aside, as applicable (including by the approval of the Board of Directors of such payment), and in any event such Series D2 Qualified Payments shall be made pursuant to and in accordance with this Subsection 2.1.2 of the Certificate of Incorporation, which has been approved by the Board of Directors, and any amendments or changes to this Subsection 2.1.2 shall require, in addition to any stockholder approval required under the Certificate of Incorporation, the approval of the Board of Directors. If upon any such liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series D2 Preferred Stock the full amount to which they shall be entitled under this Subsection 2.1.2, the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

2.1.3 Payments to Holders of Series C1 Preferred Stock. In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the holders of shares of Series C1 Preferred Stock then outstanding shall be entitled to be paid out of the assets of the Corporation available for distribution to its stockholders, on a pari passu basis with the payment of the Series D1 Liquidation Preference to the holders of shares of Series D1 Preferred Stock pursuant to Subsection 2.1.1, the payment of the Series D2 Liquidation Preference to the holders of shares of Series D2 Preferred Stock pursuant to Subsection 2.1.2, the payment of the Series C2 Liquidation Preference to the holders of shares of Series C2 Preferred Stock pursuant to Subsection 2.1.4 and the payment of the Series B1 Liquidation Preference to the holders of shares of Series B1 Preferred Stock pursuant to Subsection 2.1.5, but before any payment shall be made to the holders of Series A1 Preferred Stock or Common Stock or any other class or series of capital stock ranking on liquidation junior to the Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock by reason of their ownership thereof, an amount per share equal to the greater of (i) $1.725, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series C1 Preferred Stock, and (ii) the sum of (x) $1.15, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series C1 Preferred Stock (the "**Series C1 Original Issue Price**"), (y) any Series C1 Accruing Dividends accrued but unpaid on the Series C1 Preferred Stock, and (z) any other dividends declared but unpaid on the Series C1 Preferred Stock (the greater of clauses (i) and (ii), the "**Series C1 Liquidation Preference**"); provided that if any such payments require approval by the Board of Directors (the "**Series C1 Qualified Payments**"), then such Series C1 Qualified Payments shall have been ratified by the Board of Directors at the time of declaration, payment or set aside, as applicable (including by the approval of the Board of Directors of such payment), and in any event such Series C1 Qualified Payments shall be made pursuant to and in accordance with this Subsection 2.1.3 of the Certificate of Incorporation, which has been approved by the Board of Directors, and any amendments or changes to this Subsection 2.1.3 shall require, in addition to any stockholder approval required under the Certificate of Incorporation, the approval of the Board of Directors. If upon any such liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series C1 Preferred Stock the full amount to which they shall be entitled under this Subsection 2.1.3, the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

2.1.4 Payments to Holders of Series C2 Preferred Stock. In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the holders of shares of Series C2 Preferred Stock then outstanding shall be entitled to be paid out of the assets of the Corporation available for distribution to its stockholders, on a pari passu basis with the payment of the Series D1 Liquidation Preference to the holders of shares of Series D1 Preferred Stock pursuant to Subsection 2.1.1, Series D2 Liquidation Preference to the holders of shares of Series D2 Preferred Stock pursuant to Subsection 2.1.2, Series C1 Liquidation Preference to the holders of shares of Series C1 Preferred Stock pursuant to Subsection 2.1.3 and the payment of the Series B1 Liquidation Preference to the holders of shares of Series B1 Preferred Stock pursuant to Subsection 2.1.5, but before any payment shall be made to the holders of Series A1 Preferred Stock or Common Stock or any other class or series of capital stock ranking on liquidation junior to the Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock by reason of their ownership thereof, an amount per share equal to the greater of (i) $1.725, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series C2 Preferred Stock, and (ii) the sum of (x) $1.15, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series C2 Preferred Stock (the "**Series C2 Original Issue Price**"), (y) any Series C2 Accruing Dividends accrued but unpaid on the Series C2 Preferred Stock, and (z) any other dividends declared but unpaid on the Series C2 Preferred Stock (the greater of clauses (i) and (ii), the "**Series C2 Liquidation Preference**"); provided that if any such payments require approval by the Board of Directors (the "**Series C2 Qualified Payments**"), then such Series C2 Qualified Payments shall have been ratified by the Board of Directors at the time of declaration, payment or set aside, as applicable (including by the approval of the Board of Directors of such payment), and in any event such Series C2 Qualified Payments shall be made pursuant to and in accordance with this Subsection 2.1.4 of the Certificate of Incorporation, which has been approved by the Board of Directors, and any amendments or changes to this Subsection 2.1.4 shall require, in addition to any stockholder approval required under the Certificate of Incorporation, the approval of the Board of Directors. If upon any such liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series C2 Preferred Stock the full amount to which they shall be entitled under this Subsection 2.1.4, the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

2.1.5 Payments to Holders of Series B1 Preferred Stock. In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the holders of shares of Series B1 Preferred Stock then outstanding shall be entitled to be paid out of the assets of the Corporation available for distribution to its stockholders, on a pari passu basis with the payment of the Series D1 Liquidation Preference to the holders of shares of Series D1 Preferred Stock pursuant to Subsection 2.1.1, Series D2 Liquidation Preference to the holders of shares of Series D2 Preferred Stock pursuant to Subsection 2.1.2, Series C1 Liquidation Preference to the holders of shares of Series C1 Preferred Stock pursuant to Subsection 2.1.3 and the payment of the Series C2 Liquidation Preference to the holders of shares of Series C2 Preferred Stock pursuant to Subsection 2.1.4, but before any payment shall be made to the holders of Series A1 Preferred Stock or Common Stock or any other class or series of capital stock ranking on liquidation junior to the Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock by reason of their ownership thereof, an amount per share equal to the greater of (i) $1.50, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series B1 Preferred Stock, and (ii) the sum of (x) $1.00, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series B1 Preferred Stock (the "**Series B1 Original Issue Price**"), (y) any Series B1 Accruing Dividends accrued but unpaid on the Series B1 Preferred Stock, and (z) any other dividends declared but unpaid on the Series B1 Preferred Stock (the greater of clauses (i) and (ii), the "**Series B1 Liquidation Preference**"); provided that if any such payments require approval by the Board of Directors (the "**Series B Qualified Payments**"), then such Series B Qualified Payments shall have been ratified by the Board of Directors at the time of declaration, payment or set aside, as applicable (including by the approval of the Board of Directors of such payment), and in any event such Series B Qualified Payments shall be made pursuant to and in accordance with this Subsection 2.1.5 of the Certificate of Incorporation, which has been approved by the Board of Directors, and any amendments or changes to this Subsection 2.1.5 shall require, in addition to any stockholder approval required under the Certificate of Incorporation, the approval of the Board of Directors. If upon any such liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series B1 Preferred Stock the full amount to which they shall be entitled under this Subsection 2.1.5, the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

2.2 Payments to Holders of Series A1 Preferred Stock. In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the holders of shares of Series A1 Preferred Stock then outstanding shall be entitled to be paid out of the assets of the Corporation available for distribution to its stockholders, after payment of the Series D1 Liquidation Preference, the Series D2 Liquidation Preference, the Series C1 Liquidation Preference, the Series C2 Liquidation Preference, the Series B1 Liquidation Preference and other payments to the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock pursuant to Subsection 2.1 but before any payment shall be made to the holders of Common Stock or any other class or series of capital stock ranking on liquidation junior to the Series A1 Preferred Stock by reason of their ownership thereof, an amount per share equal to $1.00, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series A1 Preferred Stock (the "**Series A1 Original Issue Price**" and, together with the Series B1 Original Issue Price, the Series C1 Original Issue Price, the Series C2 Original Issue Price, the Series D1 Original Issue Price and the Series D2 Original Issue Price, the applicable "**Original Issue Price**"), plus any Series A1 Accruing Dividends accrued but unpaid on the Series A1 Preferred Stock, plus any other dividends declared but unpaid on the Series A1 Preferred Stock (collectively, the "**Series A1 Liquidation Preference**"). If upon any such liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series A1 Preferred Stock the full amount to which they shall be entitled under this Subsection 2.2, the holders of shares of Series A1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

2.3 Distribution of Remaining Assets. In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, after the payment of (i) the Series D1 Liquidation Preference, the Series D2 Liquidation Preference, the Series C1 Liquidation Preference, the Series C2 Liquidation Preference and the Series B1 Liquidation Preference, and other payments to the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock pursuant to Subsection 2.1, and (ii) the Series A1 Liquidation Preference to the holders of shares of Series A1 Preferred Stock pursuant to Subsection 2.2, the remaining assets of the Corporation available for distribution to its stockholders shall next be distributed in the following order of priority:

2.3.1 first, among the holders of shares of Series A1 Preferred Stock and Common Stock, on a pari passu basis and pro rata based on the number of shares held by each such holder, treating for this purpose all such securities as if they had been converted to Class A Common Stock pursuant to the terms of the Certificate of Incorporation immediately prior to such dissolution, liquidation or winding up of the Corporation or Deemed Liquidation Event, until the holders of shares of Series A1 Preferred Stock have received a per share amount equal to (i) the amount payable in respect of one share of Series B1 Preferred Stock pursuant to Subsection 2.1.5 minus (ii) the Series A1 Liquidation Preference; provided, however, that, if upon any such liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series A1 Preferred Stock and Common Stock the full amount to which they shall be entitled under this Subsection 2.3.1, the holders of shares of Series A1 Preferred Stock and Common Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full;

2.3.2 second, among the holders of shares of Series B1 Preferred Stock, Series A1 Preferred Stock and Common Stock, on a pari passu basis and pro rata based on the number of shares held by each such holder, treating for this purpose all such securities as if they had been converted to Class A Common Stock pursuant to the terms of the Certificate of Incorporation immediately prior to such dissolution, liquidation or winding up of the Corporation or Deemed Liquidation Event, until the holders of shares of Series B1 Preferred Stock have received a per share amount equal to (i) the amount payable in respect of one share of Series C1 Preferred Stock pursuant to Subsection 2.1.3 minus (ii) the Series B1 Liquidation Preference; provided, however, that, if upon any such liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series B1 Preferred Stock, Series A1 Preferred Stock and Common Stock the full amount to which they shall be entitled under this Subsection 2.3.2, the holders of shares of Series B1 Preferred Stock, Series A1 Preferred Stock and Common Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full; and

2.3.3 third, among the holders of shares of Series C1 Preferred Stock, Series C2 Preferred Stock, Series B1 Preferred Stock, Series A1 Preferred Stock and Common Stock, on a pari passu basis and pro rata based on the number of shares held by each such holder, treating for this purpose all such securities as if they had been converted to Class A Common Stock pursuant to the terms of the Certificate of Incorporation immediately prior to such dissolution, liquidation or winding up of the Corporation or Deemed Liquidation Event.

2.3.4 The aggregate amount that a holder of a share of Series A1 Preferred Stock is entitled to receive under Subsection 2.2 and this Subsection 2.3 is hereinafter referred to as the "**Series A1 Liquidation Amount**", the aggregate amount that a holder of a share of Series B1 Preferred Stock is entitled to receive under Subsection 2.1 and this Subsection 2.3 is hereinafter referred to as the "**Series B1 Liquidation Amount**", the aggregate amount that a holder of a share of Series C1 Preferred Stock is entitled to receive under Subsection 2.1 and this Subsection 2.3 is hereinafter referred to as the "**Series C1 Liquidation Amount**", the aggregate amount that a holder of a share of Series C2 Preferred Stock is entitled to receive under Subsection 2.1 and this Subsection 2.3 is hereinafter referred to as the "**Series C2 Liquidation Amount**", the aggregate amount that a holder of a share of Series D1 Preferred Stock is entitled to receive under Subsection 2.1 is hereinafter referred to as the "**Series D1 Liquidation Amount**" and the aggregate amount that a holder of a share of Series D2 Preferred Stock is entitled to receive under Subsection 2.1 is hereinafter referred to as the "**Series D2 Liquidation Amount**".

2.4 Deemed Liquidation Events.

2.4.1 Definition. Each of the following events shall be considered a "**Deemed Liquidation Event**" unless the holders of (i) a majority of the then outstanding shares of Preferred Stock, voting together as a single class on an as-converted to Class A Common Stock basis (the "**Requisite Holders**"), which for the purpose of this Subsection 2.4.1 is not subject to the Series C2/D2 Voting Restriction (as defined below) with respect to Subsection 2.4.1(b) and Subsection 2.4.1(c) below and (ii) a majority of the then outstanding shares of Series D1 Preferred Stock and Series D2 Preferred Stock, voting together as a separate class (the "**Requisite Series D1/D2 Holders**") (which for the purpose of this Subsection 2.4.1 is not subject to the Series C2/D2 Voting Restriction with respect to Subsection 2.4.1(b) and Subsection 2.4.1(c) below), elect otherwise by written notice sent to the Corporation at least 5 days prior to the effective date of any such event:

(a) a merger or consolidation in which

(i) the Corporation is a constituent party or

(ii) a subsidiary of the Corporation is a constituent party and the Corporation issues shares of its capital stock pursuant to such merger or consolidation,

except any such merger or consolidation involving the Corporation or a subsidiary in which the shares of capital stock of the Corporation outstanding immediately prior to such merger or consolidation continue to represent, or are converted into or exchanged for shares of capital stock that represent, immediately following such merger or consolidation, at least a majority, by voting power, of the capital stock of (1) the surviving or resulting corporation or (2) if the surviving or resulting corporation is a wholly owned subsidiary of another corporation immediately following such merger or consolidation, the parent corporation of such surviving or resulting corporation (provided that, for the purpose of this Subsection 2.4.1, all shares of Common Stock issuable upon exercise of Options (as defined below) outstanding immediately prior to such merger or consolidation or upon conversion of Convertible Securities (as defined below) outstanding immediately prior to such merger or consolidation shall be deemed to be outstanding immediately prior to such merger or consolidation and, if applicable, converted or exchanged in such merger or consolidation on the same terms as the actual outstanding shares of Common Stock are converted or exchanged);

(b) the sale, lease, transfer, exclusive license or other disposition, in a single transaction or series of related transactions, by the Corporation or any subsidiary of the Corporation of all or substantially all the assets of the Corporation and its subsidiaries taken as a whole (including, without limitation, the Corporation's intellectual property), or the sale or disposition (whether by merger or otherwise) of one or more subsidiaries of the Corporation if substantially all of the assets of the Corporation and its subsidiaries taken as a whole are held by such subsidiary or subsidiaries, except where such sale, lease, transfer, exclusive license or other disposition is to a wholly owned subsidiary of the Corporation; or

(c) the sale, exchange or transfer by the Corporation's stockholders of the Corporation's voting stock, in a single transaction or series of related transactions, to a person or group of affiliated persons pursuant to which such person or group of affiliated persons would hold 50% or more of the outstanding voting stock of the Corporation (or the surviving or acquiring entity).

For purposes of clarity, a business combination of the Corporation with a publicly listed "special purpose acquisition company" or its subsidiary (a "**SPAC**"), whether by merger, consolidation, stock purchase, share exchange, asset sale or otherwise (a "**SPAC Transaction**"), shall not be a Deemed Liquidation Event for any purpose hereunder.

2.4.2 Effecting a Deemed Liquidation Event.

(a) The Corporation shall not have the power to effect a Deemed Liquidation Event referred to in Subsection 2.4.1(a)(i) unless the agreement or plan of merger or consolidation for such transaction (the "**Merger Agreement**") provides that the consideration payable to the stockholders of the Corporation shall be allocated among the holders of capital stock of the Corporation in accordance with Subsections 2.1 through 2.3.

(b) In the event of a Deemed Liquidation Event referred to in Subsection 2.4.1(a)(ii) or 2.4.1(b), if the Corporation does not effect a dissolution of the Corporation under the General Corporation Law within 90 days after such Deemed Liquidation Event, then (i) the Corporation shall send a written notice to each holder of Preferred Stock no later than the 90th day after the Deemed Liquidation Event advising such holders of their right (and the requirements to be met to secure such right) pursuant to the terms of the following clause (ii) to require the redemption of such shares of Preferred Stock, and (ii) if the Requisite Holders (which, for the purpose of this Subsection 2.4.2(b), is not subject to the Series C2/D2 Voting Restriction) so request in a written instrument delivered to the Corporation not later than 120 days after such Deemed Liquidation Event, the Corporation shall use the consideration received by the Corporation for such Deemed Liquidation Event (net of any retained liabilities associated with the assets sold or technology licensed, as determined in good faith by the Board of Directors), together with any other assets of the Corporation available for distribution to its stockholders (the "**Available Proceeds**"), to the extent legally available therefor, on the 150th day after such Deemed Liquidation Event (the "**Initial Liquidation Redemption Date**"), to redeem all outstanding shares of Series A1 Preferred Stock at a price per share equal to the Series A1 Liquidation Amount (the "**Liquidation Series A1 Redemption Price**"), all outstanding shares of Series B1 Preferred Stock at a price per share equal to the Series B1 Liquidation Amount (the "**Liquidation Series B1 Redemption Price**"), all outstanding shares of Series C1 Preferred Stock at a price per share equal to the Series C1 Liquidation Amount (the "**Liquidation Series C1 Redemption Price**") all outstanding shares of Series C2 Preferred Stock at a price per share equal to the Series C2 Liquidation Amount (the "**Liquidation Series C2 Redemption Price**"), all outstanding shares of Series D1 Preferred Stock at a price per share equal to the Series D1 Liquidation Amount (the "**Liquidation Series D1 Redemption Price**"), and all outstanding shares of Series D2 Preferred Stock at a price per share equal to the Series D2 Liquidation Amount (the "**Liquidation Series D2 Redemption Price**" and, together with the Liquidation Series A1 Redemption Price, the Liquidation Series B1 Redemption Price, the Liquidation Series C1 Redemption Price, the Liquidation Series C2 Redemption Price and the Liquidation Series D1 Redemption Price, the "**Liquidation Redemption Prices**"). Notwithstanding the foregoing, in the event of a redemption pursuant to the preceding sentence, if the Available Proceeds are not sufficient to redeem all outstanding shares of Preferred Stock that are required to then be redeemed, the Corporation shall redeem a pro rata portion of each holder's shares of Preferred Stock to the fullest extent of such Available Proceeds (in the case of the Series A1 Preferred Stock, the Available Proceeds remaining after the complete redemption of Series D1 Preferred Stock by payment in full of the Series D1 Liquidation Amount, Series D2 Preferred Stock by payment in full of the Series D2 Liquidation Amount, Series C1 Preferred Stock by payment in full of the Series C1 Liquidation Amount, Series C2 Preferred Stock by payment in full of the Series C2 Liquidation Amount, and Series B1 Preferred Stock by payment in full of the Series B1 Liquidation Amount), based on the respective amounts which would otherwise be payable in respect of the shares to be redeemed if the Available Proceeds were sufficient to redeem all such shares, and shall redeem the remaining shares to have been redeemed as soon as practicable after the Corporation has funds legally available therefor (together with the Initial Liquidation Redemption Date, the "**Liquidation Redemption Dates**"). Prior to the distribution or redemption provided for in this Subsection 2.4.2(b), the Corporation shall not expend or dissipate the consideration received for such Deemed Liquidation Event, except to discharge expenses approved by the Requisite Holders incurred in connection with such Deemed Liquidation Event or in the ordinary course of business.

2.4.3 Amount Deemed Paid or Distributed. The amount deemed paid or distributed to the holders of capital stock of the Corporation upon any such merger, consolidation, sale, transfer, exclusive license, other disposition or redemption shall be the cash or the value of the property, rights or securities paid or distributed to such holders by the Corporation or the acquiring person, firm or other entity. The value of such property, rights or securities shall be determined in good faith by the Board of Directors, including the Applicable Directors (as defined below).

2.4.4 Allocation of Contingent Consideration**.** In the event of a Deemed Liquidation Event pursuant to Subsection 2.4.1(a)(i), if any portion of the consideration payable to the stockholders of the Corporation is payable only upon satisfaction of contingencies (the "**Additional Consideration**"), the Merger Agreement shall provide that (a) the portion of such consideration that is not Additional Consideration (such portion, the "**Initial Consideration**") shall be allocated among the holders of capital stock of the Corporation in accordance with Subsections 2.1 through 2.3 as if the Initial Consideration were the only consideration payable in connection with such Deemed Liquidation Event and (b) any Additional Consideration that becomes payable to the stockholders of the Corporation upon satisfaction of such contingencies shall be allocated among the holders of capital stock of the Corporation in accordance with Subsections 2.1 through 2.3 after taking into account the previous payment of the Initial Consideration as part of the same transaction. For the purposes of this Subsection 2.4.4, consideration placed into escrow or retained as holdback to be available for satisfaction of indemnification or similar obligations in connection with such Deemed Liquidation Event shall be deemed to be Additional Consideration.

3. Voting.

3.1 General. Except as provided by law or by the other provisions of the Certificate of Incorporation, including the Series C2/D2 Voting Restriction, on any matter presented to the stockholders of the Corporation for their action or consideration at any meeting of stockholders of the Corporation (or by written consent of stockholders in lieu of meeting), each holder of outstanding shares of Preferred Stock (subject to Subsection 3.2) shall be entitled to cast the number of votes equal to the number of whole shares of Class A Common Stock into which the shares of Preferred Stock held by such holder are convertible as of the record date for determining stockholders entitled to vote on such matter. Except as provided by law or by the other provisions of the Certificate of Incorporation, and subject to Subsection 3.2, holders of Preferred Stock shall vote together with the holders of Common Stock, and with the holders of any other series of Preferred Stock the terms of which so provide, as a single class.

3.2 Series C2 Preferred Stock and Series D2 Preferred Stock. Except as provided by law or Subsections 2.4.1, 2.4.2(b), 3.4(a), 3.7(a), 3.7(c), 3.8(a), 3.8(c), 3.8(d), 4.4.2, and 4.10 or clause (c) of the proviso in Subsection 8 (collectively, the "**Series C2/D2 Matters**"), the holders of Series C2 Preferred Stock and Series D2 Preferred Stock shall not be entitled to (a) vote on any matter presented to the stockholders of the Corporation for their action or consideration at any meeting of stockholders of the Corporation (or by written consent of stockholders in lieu of meeting) or (b) consent to provide a waiver for any matters for which the holders of Preferred Stock must provide their consent or waiver (the "**Series C2/D2 Voting Restriction**"). In no event shall any Series C2 Preferred Stock or Series D2 Preferred Stock be redesignated or reconstituted as a voting security at any time prior to a Restriction Removal Event (as defined in that certain amended and restated letter agreement entered into on the Series D2 Original Issue Date between the purchasers of shares of Series C2 Preferred Stock and Series D2 Preferred Stock, together with their respective affiliates (collectively, the "**Series C2/D2 Initial Holders**"), and the Corporation, (the "**Series C2/D2 Letter Agreement**")).

3.3 Election of Directors. The holders of record of the shares of Series A1 Preferred Stock, exclusively as a separate class on an as-converted to Class A Common Stock basis, shall be entitled to elect one (1) director of the Corporation (the "**Series A1 Director**"), the holders of record of the shares of Series B1 Preferred Stock, exclusively as a separate class on an as-converted to Class A Common Stock basis, shall be entitled to elect two (2) directors of the Corporation (the "**Series B1 Directors**") and the holders of record of the shares of Series C1 Preferred Stock, exclusively as a separate class on an as-converted to Class A Common Stock basis, shall be entitled to elect one (1) director of the Corporation (the "**Series C1 Director**", together with the Series A1 Director and the Series B1 Directors, the "**Preferred Directors**"). Any director elected as provided in the preceding sentence may be removed without cause by, and only by, the affirmative vote of the holders of the shares of the class or series of capital stock entitled to elect such director or directors, given either at a special meeting of such stockholders duly called for that purpose or pursuant to a written consent of stockholders. If the holders of shares of Series A1 Preferred Stock, Series B1 Preferred Stock or Series C1 Preferred Stock fail to elect a sufficient number of directors to fill all directorships for which they are entitled to elect directors, voting exclusively and as a separate class, pursuant to the first sentence of this Subsection 3.3, then any directorship not so filled shall remain vacant until such time as the holders of the applicable series of Preferred Stock elect a person to fill such directorship by vote or written consent in lieu of a meeting; and no such directorship may be filled by stockholders of the Corporation other than by the stockholders of the Corporation that are entitled to elect a person to fill such directorship, voting exclusively and as a separate class on an as-converted to Class A Common Stock basis. The holders of record of the shares of Class A Common Stock and of any other class or series of voting stock (including the Preferred Stock), exclusively and voting together as a single class on an as converted basis, shall, be entitled to elect the balance of the total number of directors of the Corporation. At any meeting held for the purpose of electing a director, the presence in person or by proxy of the holders of a majority of the outstanding shares of the class or series entitled to elect such director shall constitute a quorum for the purpose of electing such director. Except as otherwise provided in this Subsection 3.2, a vacancy in any directorship filled by the holders of any class or series shall be filled only by vote or written consent in lieu of a meeting of the holders of such class or series or by any remaining director or directors elected by the holders of such class or series pursuant to this Subsection 3.2. The rights of the holders of the Series A1 Preferred Stock shall terminate on the first date following the Series D1 Original Issue Date (as defined below) on which there are issued and outstanding less than 4,000,000 shares of Series A1 Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization that affects such shares). The rights of the holders of the Series B1 Preferred Stock shall terminate on the first date following the Series D1 Original Issue Date on which there are issued and outstanding less than 10,000,000 shares of Series B1 Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization that affects such shares). The rights of the holders of the Series C1 Preferred Stock to elect a Series C1 Director shall terminate on the first date following the Series D1 Original Issue Date on which there are issued and outstanding less than (a) 10,000,000 shares of Series C1 Preferred Stock or (b) following such time as all shares of Series C2 Preferred Stock have been converted into shares of Series C1 Preferred Stock pursuant to the terms hereof, 20,000,000 shares of Series C1 Preferred Stock (in each case, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization that affects such shares).

3.4 Preferred Stock Protective Provisions. At any time when at least an aggregate of 4,000,000 shares of Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization that affects such shares) are outstanding, the Corporation shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of the Requisite Holders (subject to the Series C2/D2 Voting Restriction except in respect of a Deemed Liquidation Event set out in Subsections 2.4.1(b) or 2.4.1(c)):

(a) liquidate, dissolve or wind-up the business and affairs of the Corporation, effect any Deemed Liquidation Event, consummate a SPAC Transaction that is not a Qualified SPAC Transaction (as defined below), or consent to any of the foregoing;

(b) amend, alter or repeal in any material respect any provision of the Certificate of Incorporation or Bylaws of the Corporation;

(c) create, or authorize the creation of, or issue or obligate itself to issue shares of, any additional class or series of capital stock unless the same ranks junior to each series of Preferred Stock with respect to the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends and redemption rights, or increase the authorized number of shares of any series of Preferred Stock or increase the authorized number of shares of any additional class or series of capital stock unless the same ranks junior to each series of Preferred Stock with respect to the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends and redemption rights;

(d) (i) reclassify, alter or amend any existing security of the Corporation that is pari passu with any series of Preferred Stock in respect of the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends or rights of redemption, if such reclassification, alteration or amendment would render such other security senior to such series of Preferred Stock in respect of any such right, preference or privilege, or (ii) reclassify, alter or amend any existing security of the Corporation that is junior to any series of Preferred Stock in respect of the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends or rights of redemption, if such reclassification, alteration or amendment would render such other security senior to or pari passu with such series of Preferred Stock in respect of any such right, preference or privilege;

(e) purchase or redeem (or permit any subsidiary to purchase or redeem) or pay or declare any dividend or make any distribution on, any shares of capital stock of the Corporation (other than on the Preferred Stock) other than (i) redemptions of or dividends or distributions on the Preferred Stock as expressly authorized herein, (ii) dividends or other distributions payable on the Common Stock solely in the form of additional shares of Common Stock, (iii) repurchases of stock from former employees, officers, directors, consultants or other persons who performed services for the Corporation or any subsidiary in connection with the cessation of such employment or service at or below the original purchase price or as approved by the Board of Directors, including the approval of a majority of the Preferred Directors (collectively, the "**Applicable Directors**"), or (iii) repurchases pursuant to that certain Seventh Amended and Restated Right of First Refusal and Co-Sale Agreement, dated on or about the Series D1 Original Issue Date, by and among the Corporation and the other parties named therein, as such may be amended from time to time;

(f) create, or authorize the creation of, or issue, or authorize the issuance of any debt security, or permit any subsidiary to take any such action with respect to any debt security, if the aggregate indebtedness of the Corporation and its subsidiaries for borrowed money following such action would exceed $1,000,000, unless such debt security arises from commercial bank loans, loans from institutional or other third-party lenders, equipment leases, bank lines of credit and similar arrangements approved by the Board of Directors, including the approval of the Applicable Directors;

(g) increase or decrease (other than by redemption or conversion) the total number of authorized shares of Common Stock or Preferred Stock or designated shares of any series of Preferred Stock or any class of Common Stock;

(h) increase or decrease the authorized number of directors constituting the Board of Directors;

(i) acquire or sell any entity or assets of the Corporation in one or a series of related transactions if the purchase or sale price (as applicable) exceeds $1,000,000 in the aggregate (other than sales of the Corporation's products in the ordinary course of business);

(j) acquire any entity or assets if the target entity is not, or the acquired assets are not, as applicable, related to the principal product or products of the Corporation;

(k) issue loans to, or make investments in, any of the Corporation's joint ventures, partnerships or any other entity in which the Corporation holds equity securities, other than a wholly-owned subsidiary of the Corporation;

(l) adopt, or materially amend, any employee equity incentive plan or other incentive or profit-sharing program;

(m) issue stock options or warrants to purchase Common Stock or Preferred Stock (other than options or warrants issued to employees, consultants, directors or other service providers in accordance with the Corporation's equity incentive plans approved by the Board of Directors, including the approval of the Applicable Directors);

(n) materially change or alter the nature of the Corporation's business; or

(o) agree to do any of the foregoing.

3.5 Series A1 Preferred Stock Protection Provisions. At any time when at least 4,000,000 shares of Series A1 Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization that affects such shares) are outstanding, the Corporation shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, amend, alter or repeal any provision of the Certificate of Incorporation or Bylaws of the Corporation so as to adversely affect the powers, preferences or rights of the Series A1 Preferred Stock in a manner that is adverse and disproportionate relative to the effect on any other series of Preferred Stock without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of the holders of a majority of the then outstanding shares of Series A1 Preferred Stock, given in writing or by vote at a meeting, consenting or voting (as the case may be) separately as a class.

3.6 Series B1 Preferred Stock Protection Provisions. At any time when at least 10,000,000 shares of Series B1 Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization that affects such shares) are outstanding, the Corporation shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of holders of at least 59% of the then outstanding shares of Series B1 Preferred Stock, voting as a separate class (the "**Requisite Series B1 Holders**"), given in writing or by vote at a meeting, consenting or voting (as the case may be) separately as a class:

(a) amend, alter or repeal any provision of the Certificate of Incorporation or Bylaws of the Corporation so as to adversely affect the powers, preferences or rights of the Series B1 Preferred Stock in a manner that is adverse and disproportionate relative to the effect on any other series of Preferred Stock, including, but not limited to, any amendments, alterations or repeals of the definition of "Requisite Series B1 Holders"; or

(b) (i) reclassify, alter or amend any existing security of the Corporation that is pari passu with the Series B1 Preferred Stock in respect of the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends or rights of redemption, if such reclassification, alteration or amendment would render such other security senior to the Series B1 Preferred Stock in respect of any such right, preference or privilege, or (ii) reclassify, alter or amend any existing security of the Corporation that is junior to the Series B1 Preferred Stock in respect of the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends or rights of redemption, if such reclassification, alteration or amendment would render such other security senior to or pari passu with the Series B1 Preferred Stock in respect of any such right, preference or privilege.

3.7 Series C1/C2 Preferred Stock Protection Provisions. At any time when at least 20,000,000 shares of Series C1 Preferred Stock and/or Series C2 Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization that affects such shares) are outstanding, the Corporation shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of holders of a majority of the then outstanding shares of Series C1 Preferred Stock (and Series C2 Preferred Stock, together with the Series C1 Preferred Stock, with respect to clauses (a) and (c) only), voting as a separate class on an as-converted basis, given in writing or by vote at a meeting, consenting or voting (as the case may be) separately as a class:

(a) amend, alter or repeal any provision of the Certificate of Incorporation or Bylaws of the Corporation so as to adversely affect the powers, preferences or rights of the Series C1 Preferred Stock and Series C2 Preferred Stock in a manner that is adverse and disproportionate relative to the effect on any other series of Preferred Stock, or amend any provision in Subsection 3.2 (including with respect to the Series C2/D2 Matters and the Series C2/D2 Voting Restriction);

(b) increase or decrease the authorized number of shares of Series C1 Preferred Stock and/or Series C2 Preferred Stock; or

(c) (i) reclassify, alter or amend any existing security of the Corporation that is pari passu with the Series C1 Preferred Stock and Series C2 Preferred Stock in respect of the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends or rights of redemption, if such reclassification, alteration or amendment would render such other security senior to the Series C1 Preferred Stock and Series C2 Preferred Stock in respect of any such right, preference or privilege, or (ii) reclassify, alter or amend any existing security of the Corporation that is junior to the Series C1 Preferred Stock and Series C2 Preferred Stock in respect of the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends or rights of redemption, if such reclassification, alteration or amendment would render such other security senior to or pari passu with the Series C1 Preferred Stock and Series C2 Preferred Stock in respect of any such right, preference or privilege.

3.8 Series D1/D2 Preferred Stock Protection Provisions. At any time when at least 4,500,000 shares of Series D1 Preferred Stock and/or Series D2 Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization that affects such shares) are outstanding, the Corporation shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of holders of a majority of the then outstanding shares of Series D1 Preferred Stock (and Series D2 Preferred Stock, together with the Series D1 Preferred Stock, with respect to clause (a), (c) and (d) only), voting as a separate class on an as-converted to Class A Common Stock basis, given in writing or by vote at a meeting, consenting or voting (as the case may be) separately as a class:

(a) amend, alter or repeal any provision of the Certificate of Incorporation or Bylaws of the Corporation so as to adversely affect the powers, preferences or rights of the Series D1 Preferred Stock and Series D2 Preferred Stock in a manner that is adverse and disproportionate relative to the effect on any other series of Preferred Stock;

(b) increase or decrease the authorized number of shares of Series D1 Preferred Stock and/or Series D2 Preferred Stock;

(c) (i) reclassify, alter or amend any existing security of the Corporation that is pari passu with the Series D1 Preferred Stock and Series D2 Preferred Stock in respect of the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends or rights of redemption, if such reclassification, alteration or amendment would render such other security senior to the Series D1 Preferred Stock and Series D2 Preferred Stock in respect of any such right, preference or privilege, or (ii) reclassify, alter or amend any existing security of the Corporation that is junior to the Series D1 Preferred Stock and Series D2 Preferred Stock in respect of the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends or rights of redemption, if such reclassification, alteration or amendment would render such other security senior to or pari passu with the Series D1 Preferred Stock and Series D2 Preferred Stock in respect of any such right, preference or privilege;

(d) enter into or consummate any SPAC Transaction unless the agreement or plan of merger or consolidation or related agreements pursuant to which such SPAC Transaction is to be consummated provides that the consideration payable to the holders of the Series D1 Preferred Stock and/or Series D2 Preferred Stock in respect thereof shall be equal to or greater than the Series D1 Liquidation Preference or Series D2 Liquidation Preference, as applicable; or

(e) amend this Subsection 3.8.

4. Optional Conversion. The holders of the Preferred Stock shall have conversion rights as follows (the "**Conversion Rights**"):

4.1 Right to Convert.

4.1.1 Conversion Ratio. Each share of Series A1 Preferred Stock shall be convertible, at the option of the holder thereof, at any time and from time to time, and without the payment of additional consideration by the holder thereof, into such number of fully paid and nonassessable shares of Class A Common Stock as is determined by dividing (x) the Series A1 Original Issue Price by (y) the Series A1 Conversion Price (as defined below) in effect at the time of conversion. Each share of Series B1 Preferred Stock shall be convertible, at the option of the holder thereof, at any time and from time to time, and without the payment of additional consideration by the holder thereof, into such number of fully paid and nonassessable shares of Class A Common Stock as is determined by dividing (x) the Series B1 Original Issue Price by (y) the Series B1 Conversion Price (as defined below) in effect at the time of conversion. Each share of Series C1 Preferred Stock shall be convertible, at the option of the holder thereof, at any time and from time to time, and without the payment of additional consideration by the holder thereof, into such number of fully paid and nonassessable shares of Class A Common Stock as is determined by dividing (x) the Series C1 Original Issue Price by (y) the Series C1 Conversion Price (as defined below) in effect at the time of conversion. Each share of Series D1 Preferred Stock shall be convertible, at the option of the holder thereof, at any time and from time to time, and without the payment of additional consideration by the holder thereof, into such number of fully paid and nonassessable shares of Class A Common Stock as is determined by dividing (x) the Series D1 Original Issue Price by (y) the Series D1 Conversion Price (as defined below) in effect at the time of conversion. The Series C2/D2 Initial Holders (as defined in the Series C2/D2 Letter Agreement) shall have the right, at any time, to convert any shares of Series C2 Preferred Stock or Series D2 Preferred Stock then held by the Series C2/D2 Initial Holders into such number of fully paid and nonassessable shares of Class A Common Stock or Class B Common Stock, in each case, as is determined by dividing (x) the Series C2 Original Issue Price or Series D2 Original Issue Price, as applicable, by (y) the Series C2 Conversion Price or Series D2 Conversion Price (each as defined below), respectively, in effect at the time of conversion; provided, however, that, notwithstanding the foregoing, such conversion shall only be permitted if and to the extent that, following such conversion, all of the voting securities of the Corporation held by the Series C2/D2 Initial Holders would in the aggregate represent less than ten percent (10%) of the combined voting power of the Corporation's outstanding voting securities. The "**Series A1 Conversion Price**" shall initially be equal to $1.00, the "**Series B1 Conversion Price**" shall initially be equal to $1.00, the "**Series C1 Conversion Price**" and "**Series C2 Conversion Price**" shall each initially be equal to $1.15, and the "**Series D1 Conversion Price**" and "**Series D2 Conversion Price**" shall each initially be equal to $3.60. The Series A1 Conversion Price, Series B1 Conversion Price, Series C1 Conversion Price, Series C2 Conversion Price, Series D1 Conversion Price and Series D2 Conversion Price are sometimes referred to herein, individually, as a/the "**Conversion Price**." The initial Series A1 Conversion Price, Series B1 Conversion Price, Series C1 Conversion Price, Series C2 Conversion Price, Series D1 Conversion Price and Series D2 Conversion Price, and the rates at which shares of such series of Preferred Stock may be converted into shares of Class A Common Stock or Class B Common Stock, as applicable, shall be subject to adjustment as provided below.

4.1.2 Series C2/D2 Conversion to Series C1/D1 Preferred Stock. The Series C2/D2 Initial Holders shall have the right, at any time, to convert any shares of Series C2 Preferred Stock or Series D2 Preferred Stock held by the Series C2/D2 Initial Holders into an equal number of shares of Series C1 Preferred Stock or Series D1 Preferred Stock, respectively; provided, that, notwithstanding the foregoing, such conversion shall only be permitted if, following such conversion, all of the voting securities held by the Series C2/D2 Initial Holders would in the aggregate represent less than ten percent (10%) of the combined voting power of the Corporation's outstanding voting securities. If there is more than one (1) Series C2/D2 Initial Holder, the conversion set out in this Subsection 4.1.2 shall be pro rata based on the number of shares held by each such holder, treating for this purpose all such securities as if they had been converted to Class A Common Stock pursuant to the terms of the Certificate of Incorporation immediately prior to conversion.

4.1.3 Series C2/D2 Conversion to Class B Common Stock. Notwithstanding anything to the contrary contained herein, during the period commencing immediately prior to the effectiveness of any registration of the Class A Common Stock under Section 12 of the Securities Exchange Act of 1934, as amended (the "**Exchange Act**"), and ending immediately following such time after such effectiveness as the Class A Common Stock is not deemed to constitute an "equity security" pursuant to Rule 13d-1(i) under the Exchange Act (an "**Exchange Act Registration Period**") or such earlier time as such Exchange Act Registration Period terminates in accordance with this paragraph, shares of Series C2 Preferred Stock and Series D2 Preferred Stock shall not be convertible into Class A Common Stock, but instead each share of Series C2 Preferred Stock and Series D2 Preferred Stock shall be convertible, at the option of the holder thereof, at the office of the Corporation or any transfer agent for such stock, into fully paid and nonassessable shares of Class B Common Stock. The number of shares of Class B Common Stock into which each share of Series C2 Preferred Stock and Series D2 Preferred Stock may be converted shall be determined, with respect to the shares of Series C2 Preferred Stock, by dividing the Original Series C2 Issue Price by the Series C2 Conversion Price in effect on the date that the holder thereof elects to convert such share and, with respect to the shares of Series D2 Preferred Stock, by dividing the Original Series D2 Issue Price by the Series D2 Conversion Price in effect on the date that the holder thereof elects to convert such share. Notwithstanding anything to the contrary contained herein, any Exchange Act Registration Period shall automatically terminate upon the earliest to occur of (x) 5:00 p.m. (New York City time) on the third (3^{rd}) Business Day (as defined below) following the commencement of the Exchange Act Registration Period, if the Company shall not prior to such time have entered into an underwriting agreement with respect to a proposed initial underwritten public offering of the Class A Common Stock, (y) the termination of an underwriting agreement entered into in connection with a proposed initial underwritten public offering of the Class A Common Stock, if such initial public offering shall not have been consummated prior to such termination, and (z) 5:00 p.m. (New York City time) on the tenth (10^{th}) Business Day following the commencement of the Exchange Act Registration Period, if the Company shall not prior to such time have consummated a Qualified Public Offering (as defined below). "**Business Day**" means any day other than a Saturday, Sunday or other day on which commercial banks are authorized to close under the laws of, or are in fact closed in, New York, New York.

4.1.4 Termination of Conversion Rights. In the event of a liquidation, dissolution or winding up of the Corporation or a Deemed Liquidation Event, the Conversion Rights shall terminate at the close of business on the last full day preceding the date fixed for the payment of any such amounts distributable on such event to the holders of Preferred Stock.

4.2 Fractional Shares. No fractional shares of Common Stock shall be issued upon conversion of the Preferred Stock. In lieu of any fractional shares to which the holder would otherwise be entitled, the Corporation shall pay cash equal to such fraction multiplied by the fair market value of a share of Common Stock as determined in good faith by the Board of Directors of the Corporation, including the Applicable Directors. Whether or not fractional shares would be issuable upon such conversion shall be determined on the basis of the total number of shares of Preferred Stock the holder is at the time converting into Common Stock and the aggregate number of shares of Common Stock issuable upon such conversion.

4.3 Mechanics of Conversion.

4.3.1 Notice of Conversion. In order for a holder of Preferred Stock to voluntarily convert shares of Preferred Stock into shares of Class A Common Stock or Class B Common Stock, as applicable, such holder shall surrender the certificate or certificates for such shares of Preferred Stock (or, if such registered holder alleges that such certificate has been lost, stolen or destroyed, a lost certificate affidavit and agreement reasonably acceptable to the Corporation to indemnify the Corporation against any claim that may be made against the Corporation on account of the alleged loss, theft or destruction of such certificate), at the office of the transfer agent for the Preferred Stock (or at the principal office of the Corporation if the Corporation serves as its own transfer agent), together with written notice that such holder elects to convert all or any number of the shares of the Preferred Stock represented by such certificate or certificates and, if applicable, any event on which such conversion is contingent. Such notice shall state such holder's name or the names of the nominees in which such holder wishes the certificate or certificates for shares of Class A Common Stock or Class B Common Stock, as applicable, to be issued. If required by the Corporation, certificates surrendered for conversion shall be endorsed or accompanied by a written instrument or instruments of transfer, in form satisfactory to the Corporation, duly executed by the registered holder or his, her or its attorney duly authorized in writing. The close of business on the date of receipt by the transfer agent (or by the Corporation if the Corporation serves as its own transfer agent) of such certificates (or lost certificate affidavit and agreement) and notice shall be the time of conversion (the "**Conversion Time**"), and the shares of Class A Common Stock or Class B Common Stock, as applicable, issuable upon conversion of the shares represented by such certificate shall be deemed to be outstanding of record as of such date. The Corporation shall, as soon as practicable after the Conversion Time, (i) issue and deliver to such holder of Preferred Stock, or to his, her or its nominees, a certificate or certificates for the number of full shares of Class A Common Stock or Class B Common Stock, as applicable, issuable upon such conversion in accordance with the provisions hereof and a certificate for the number (if any) of the shares of Preferred Stock represented by the surrendered certificate that were not converted into Class A Common Stock or Class B Common Stock, as applicable, (ii) pay in cash such amount as provided in Subsection 4.2 in lieu of any fraction of a share of Class A Common Stock or Class B Common Stock, as applicable, otherwise issuable upon such conversion and (iii) pay all declared but unpaid dividends on the shares of Preferred Stock converted.

4.3.2 Reservation of Shares. The Corporation shall at all times when any shares of Preferred Stock shall be outstanding, reserve and keep available out of its authorized but unissued capital stock, for the purpose of effecting the conversion of Preferred Stock, such number of its duly authorized shares of Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding Preferred Stock; and if at any time the number of authorized but unissued shares of Common Stock shall not be sufficient to effect the conversion of all then outstanding shares of Preferred Stock, the Corporation shall take such corporate action as may be necessary to increase its authorized but unissued shares of Common Stock to such number of shares as shall be sufficient for such purposes, including, without limitation, engaging in best efforts to obtain the requisite stockholder approval of any necessary amendment to the Certificate of Incorporation. Before taking any action which would cause an adjustment reducing one or more Conversion Prices below the then par value of the shares of Common Stock issuable upon conversion of the applicable series of Preferred Stock, the Corporation will take any corporate action which may, in the opinion of its counsel, be necessary in order that the Corporation may validly and legally issue fully paid and nonassessable shares of Common Stock at such adjusted Conversion Price(s).

4.3.3 Effect of Conversion. All shares of Preferred Stock which shall have been surrendered for conversion as herein provided shall no longer be deemed to be outstanding and all rights with respect to such shares shall immediately cease and terminate at the Conversion Time, except only the right of the holders thereof to receive shares of Common Stock in exchange therefor, to receive payment in lieu of any fraction of a share otherwise issuable upon such conversion as provided in Subsection 4.2 and to receive payment of any dividends declared but unpaid thereon. Any shares of Preferred Stock so converted shall be retired and cancelled and may not be reissued as shares of such series, and the Corporation may thereafter take such appropriate action (without the need for stockholder action) as may be necessary to reduce the authorized number of shares of Preferred Stock accordingly.

4.3.4 No Further Adjustment. Upon any such conversion, no adjustment to the applicable Conversion Price shall be made for any declared but unpaid dividends on the applicable series of Preferred Stock surrendered for conversion or on the Common Stock delivered upon conversion.

4.3.5 Taxes. The Corporation shall pay any and all issue and other similar taxes that may be payable in respect of any issuance or delivery of shares of Common Stock upon conversion of shares of Preferred Stock pursuant to this Section 4. The Corporation shall not, however, be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of shares of Common Stock in a name other than that in which the shares of Preferred Stock so converted were registered, and no such issuance or delivery shall be made unless and until the person or entity requesting such issuance has paid to the Corporation the amount of any such tax or has established, to the satisfaction of the Corporation, that such tax has been paid.

4.4 Adjustments to Conversion Prices for Diluting Issues.

4.4.1 Special Definitions. For purposes of this Article Fourth, the following definitions shall apply:

(a) "**Option**" shall mean rights, options or warrants to subscribe for, purchase or otherwise acquire Common Stock or Convertible Securities.

(b) "**Series D1 Original Issue Date**" shall mean the date on which the first share of Series D1 Preferred Stock was issued.

(c) "**Convertible Securities**" shall mean any evidences of indebtedness, shares or other securities directly or indirectly convertible into or exchangeable for Common Stock, but excluding Options.

(d) "**Additional Shares of Common Stock**" shall mean all shares of Common Stock issued (or, pursuant to Subsection 4.4.3 below, deemed to be issued) by the Corporation after the Series D1 Original Issue Date, other than (1) the following shares of Common Stock and (2) shares of Common Stock deemed issued pursuant to the following Options and Convertible Securities (clauses (1) and (2), collectively, "**Exempted Securities**"):

(i) shares of Common Stock, Options or Convertible Securities issued as a dividend or distribution on Preferred Stock;

(ii) shares of Common Stock, Options or Convertible Securities issued by reason of a dividend, stock split, split-up or other distribution on shares of Common Stock that is covered by Subsection 4.5, 4.6, 4.7 or 4.8;

(iii) shares of Common Stock or Options issued to employees or directors of, or consultants or advisors to, the Corporation or any of its subsidiaries pursuant to a plan, agreement or arrangement approved by the Board of Directors;

(iv) shares of Common Stock or Convertible Securities actually issued upon the exercise of Options or shares of Common Stock actually issued upon the conversion or exchange of Convertible Securities, in each case provided such issuance is pursuant to the terms of such Option or Convertible Security;

(v) shares of Common Stock, Options or Convertible Securities issued to banks, equipment lessors or other financial institutions, or to real property lessors, pursuant to a debt financing, equipment leasing or real property leasing transaction approved by the Board of Directors, including the Applicable Directors;

(vi) shares of Common Stock, Options or Convertible Securities issued to suppliers or third party service providers in connection with the provision of goods or services pursuant to transactions approved by the Board of Directors, including the Applicable Directors;

(vii) shares of Common Stock, Options or Convertible Securities issued pursuant to the acquisition of another corporation by the Corporation by merger, purchase of substantially all of the assets or other reorganization or to a joint venture agreement, provided, that such issuances are approved by the Board of Directors, including the Applicable Directors;

(viii) shares of Common Stock, Options or Convertible Securities issued in connection with sponsored research, collaboration, technology license, development, OEM, marketing or other similar agreements or strategic partnerships approved by the Board of Directors, including the Applicable Directors;

(ix) shares of Common Stock issued in transactions approved by the Board of Directors of the Corporation, including the Applicable Directors, which specifically states that such shares of Common Stock shall be Exempted Securities;

(x) shares of Common Stock issued pursuant to the Corporation's first underwritten public offering of its Common Stock under the Securities Act of 1933, as amended; or

(xi) shares of Series D1 Preferred Stock or Series D2 Preferred Stock issued pursuant to the terms of the Series D1/D2 Preferred Stock Purchase Agreement, dated on or about the Series D1 Original Issue Date, by and among the Corporation and the purchasers of Series D1 Preferred Stock and/or Series D2 Preferred Stock party thereto.

4.4.2 No Adjustment of Conversion Price. No adjustment in the Series A1 Conversion Price shall be made as the result of the issuance or deemed issuance of Additional Shares of Common Stock if the Corporation receives written notice from the holders of a majority of the outstanding shares of Series A1 Preferred Stock agreeing that no such adjustment shall be made as the result of the issuance or deemed issuance of such Additional Shares of Common Stock. No adjustment in the Series B1 Conversion Price shall be made as the result of the issuance or deemed issuance of Additional Shares of Common Stock if the Corporation receives written notice from the Requisite Series B1 Holders agreeing that no such adjustment shall be made as the result of the issuance or deemed issuance of such Additional Shares of Common Stock. No adjustment in the Series C1 Conversion Price or Series C2 Conversion Price shall be made as the result of the issuance or deemed issuance of Additional Shares of Common Stock if the Corporation receives written notice from holders of a majority of the outstanding shares of Series C1 Preferred Stock and Series C2 Preferred Stock, voting together as a single class, agreeing that no such adjustment shall be made as the result of the issuance or deemed issuance of such Additional Shares of Common Stock. No adjustment in the Series D1 Conversion Price or Series D2 Conversion Price shall be made as the result of the issuance or deemed issuance of Additional Shares of Common Stock if the Corporation receives written notice from holders of a majority of the outstanding shares of Series D1 Preferred Stock and Series D2 Preferred Stock, voting together as a single class, agreeing that no such adjustment shall be made as the result of the issuance or deemed issuance of such Additional Shares of Common Stock.

4.4.3 Deemed Issue of Additional Shares of Common Stock.

(a) If the Corporation at any time or from time to time after the Series D1 Original Issue Date shall issue any Options or Convertible Securities (excluding Options or Convertible Securities which are themselves Exempted Securities) or shall fix a record date for the determination of holders of any class of securities entitled to receive any such Options or Convertible Securities, then the maximum number of shares of Common Stock (as set forth in the instrument relating thereto, assuming the satisfaction of any conditions to exercisability, convertibility or exchangeability but without regard to any provision contained therein for a subsequent adjustment of such number) issuable upon the exercise of such Options or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, shall be deemed to be Additional Shares of Common Stock issued as of the time of such issue or, in case such a record date shall have been fixed, as of the close of business on such record date.

(b) If the terms of any Option or Convertible Security, the issuance of which resulted in an adjustment to a Conversion Price pursuant to the terms of Subsection 4.4.4, are revised as a result of an amendment to such terms or any other adjustment pursuant to the provisions of such Option or Convertible Security (but excluding automatic adjustments to such terms pursuant to anti-dilution or similar provisions of such Option or Convertible Security) to provide for either (1) any increase or decrease in the number of shares of Common Stock issuable upon the exercise, conversion and/or exchange of any such Option or Convertible Security or (2) any increase or decrease in the consideration payable to the Corporation upon such exercise, conversion and/or exchange, then, effective upon such increase or decrease becoming effective, the applicable Conversion Price computed upon the original issue of such Option or Convertible Security (or upon the occurrence of a record date with respect thereto) shall be readjusted to such Conversion Price as would have been obtained had such revised terms been in effect upon the original date of issuance of such Option or Convertible Security. Notwithstanding the foregoing, no readjustment pursuant to this clause (b) shall have the effect of increasing a Conversion Price to an amount which exceeds the lower of (i) the applicable Conversion Price in effect immediately prior to the original adjustment made as a result of the issuance of such Option or Convertible Security, or (ii) the applicable Conversion Price that would have resulted from any issuances of Additional Shares of Common Stock (other than deemed issuances of Additional Shares of Common Stock as a result of the issuance of such Option or Convertible Security) between the original adjustment date and such readjustment date.

(c) If the terms of any Option or Convertible Security (excluding Options or Convertible Securities which are themselves Exempted Securities), the issuance of which did not result in an adjustment to a Conversion Price pursuant to the terms of Subsection 4.4.4 (either because the consideration per share (determined pursuant to Subsection 4.4.5) of the Additional Shares of Common Stock subject thereto was equal to or greater than the applicable Conversion Price then in effect, or because such Option or Convertible Security was issued before the Series D1 Original Issue Date), are revised after the Series D1 Original Issue Date as a result of an amendment to such terms or any other adjustment pursuant to the provisions of such Option or Convertible Security (but excluding automatic adjustments to such terms pursuant to anti-dilution or similar provisions of such Option or Convertible Security) to provide for either (1) any increase in the number of shares of Common Stock issuable upon the exercise, conversion or exchange of any such Option or Convertible Security or (2) any decrease in the consideration payable to the Corporation upon such exercise, conversion or exchange, then such Option or Convertible Security, as so amended or adjusted, and the Additional Shares of Common Stock subject thereto (determined in the manner provided in Subsection 4.4.3(a)) shall be deemed to have been issued effective upon such increase or decrease becoming effective.

(d) Upon the expiration or termination of any unexercised Option or unconverted or unexchanged Convertible Security (or portion thereof) which resulted (either upon its original issuance or upon a revision of its terms) in an adjustment to a Conversion Price pursuant to the terms of Subsection 4.4.4, the applicable Conversion Price shall be readjusted to such Conversion Price as would have been obtained had such Option or Convertible Security (or portion thereof) never been issued.

(e) If the number of shares of Common Stock issuable upon the exercise, conversion and/or exchange of any Option or Convertible Security, or the consideration payable to the Corporation upon such exercise, conversion and/or exchange, is calculable at the time such Option or Convertible Security is issued or amended but is subject to adjustment based upon subsequent events, any adjustment to a Conversion Price provided for in this Subsection 4.4.3 shall be effected at the time of such issuance or amendment based on such number of shares or amount of consideration without regard to any provisions for subsequent adjustments (and any subsequent adjustments shall be treated as provided in clauses (b) and (c) of this Subsection 4.4.3). If the number of shares of Common Stock issuable upon the exercise, conversion and/or exchange of any Option or Convertible Security, or the consideration payable to the Corporation upon such exercise, conversion and/or exchange, cannot be calculated at all at the time such Option or Convertible Security is issued or amended, any adjustment to a Conversion Price that would result under the terms of this Subsection 4.4.3 at the time of such issuance or amendment shall instead be effected at the time such number of shares and/or amount of consideration is first calculable (even if subject to subsequent adjustments), assuming for purposes of calculating such adjustment to the applicable Conversion Price that such issuance or amendment took place at the time such calculation can first be made.

4.4.4 Adjustment of Conversion Prices Upon Issuance of Additional Shares of Common Stock. In the event the Corporation shall at any time after the Series D1 Original Issue Date issue Additional Shares of Common Stock (including Additional Shares of Common Stock deemed to be issued pursuant to Subsection 4.4.3), without consideration or for a consideration per share less than a Conversion Price in effect immediately prior to such issue, then the applicable Conversion Price shall be reduced, concurrently with such issue, to a price (calculated to the nearest one-hundredth of a cent) determined in accordance with the following formula:

$$CP_2 = CP_1 * (A + B) \div (A + C).$$

For purposes of the foregoing formula, the following definitions shall apply:

(a) "CP_2" shall mean the applicable Conversion Price in effect immediately after such issue of Additional Shares of Common Stock

(b) "CP_1" shall mean the applicable Conversion Price in effect immediately prior to such issue of Additional Shares of Common Stock;

(c) "A" shall mean the number of shares of Common Stock outstanding immediately prior to such issue of Additional Shares of Common Stock (treating for this purpose as outstanding all shares of Common Stock issuable upon exercise of Options outstanding immediately prior to such issue or upon conversion or exchange of Convertible Securities (including the Preferred Stock) outstanding (assuming exercise of any outstanding Options therefor) immediately prior to such issue);

(d) "B" shall mean the number of shares of Common Stock that would have been issued if such Additional Shares of Common Stock had been issued at a price per share equal to CP_1 (determined by dividing the aggregate consideration received by the Corporation in respect of such issue by CP_1); and

(e) "C" shall mean the number of such Additional Shares of Common Stock issued in such transaction.

4.4.5 Determination of Consideration. For purposes of Subsection 4.4.4, the consideration received by the Corporation for the issue of any Additional Shares of Common Stock shall be computed as follows:

(a) Cash and Property: Such consideration shall:

(i) insofar as it consists of cash, be computed at the aggregate amount of cash received by the Corporation, excluding amounts paid or payable for accrued interest;

(ii) insofar as it consists of property other than cash, be computed at the fair market value thereof at the time of such issue, as determined in good faith by the Board of Directors of the Corporation, including the Applicable Directors; and

(iii) in the event Additional Shares of Common Stock are issued together with other shares or securities or other assets of the Corporation for consideration which covers both, be the proportion of such consideration so received, computed as provided in clauses (i) and (ii) above, as determined in good faith by the Board of Directors.

(b) Options and Convertible Securities. The consideration per share received by the Corporation for Additional Shares of Common Stock deemed to have been issued pursuant to Subsection 4.4.3, relating to Options and Convertible Securities, shall be determined by dividing

(i) the total amount, if any, received or receivable by the Corporation as consideration for the issue of such Options or Convertible Securities, plus the minimum aggregate amount of additional consideration (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such consideration) payable to the Corporation upon the exercise of such Options or the conversion or exchange of such Convertible Securities, or in the case of Options for Convertible Securities, the exercise of such Options for Convertible Securities and the conversion or exchange of such Convertible Securities, by

(ii) the maximum number of shares of Common Stock (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such number) issuable upon the exercise of such Options or the conversion or exchange of such Convertible Securities, or in the case of Options for Convertible Securities, the exercise of such Options for Convertible Securities and the conversion or exchange of such Convertible Securities.

4.4.6 Multiple Closing Dates. In the event the Corporation shall issue on more than one date Additional Shares of Common Stock that are a part of one transaction or a series of related transactions and that would result in an adjustment to a Conversion Price pursuant to the terms of Subsection 4.4.4, and such issuance dates occur within a period of no more than 90 days from the first such issuance to the final such issuance, then, upon the final such issuance, the applicable Conversion Price shall be readjusted to give effect to all such issuances as if they occurred on the date of the first such issuance (and without giving effect to any additional adjustments as a result of any such subsequent issuances within such period).

4.5 Adjustment for Stock Splits and Combinations. If the Corporation shall at any time or from time to time after the Series D1 Original Issue Date effect a subdivision of the outstanding Common Stock, the Conversion Prices in effect immediately before that subdivision shall be proportionately decreased so that the number of shares of Common Stock issuable on conversion of each share of such series shall be increased in proportion to such increase in the aggregate number of shares of Common Stock outstanding. If the Corporation shall at any time or from time to time after the Series D1 Original Issue Date combine the outstanding shares of Common Stock, the Conversion Prices in effect immediately before the combination shall be proportionately increased so that the number of shares of Common Stock issuable on conversion of each share of such series shall be decreased in proportion to such decrease in the aggregate number of shares of Common Stock outstanding. Any adjustment under this subsection shall become effective at the close of business on the date the subdivision or combination becomes effective.

4.6 Adjustment for Certain Dividends and Distributions. In the event the Corporation at any time or from time to time after the Series D1 Original Issue Date shall make or issue, or fix a record date for the determination of holders of Common Stock entitled to receive, a dividend or other distribution payable on the Common Stock in additional shares of Common Stock, then and in each such event the Conversion Prices in effect immediately before such event shall be decreased as of the time of such issuance or, in the event such a record date shall have been fixed, as of the close of business on such record date, by multiplying the applicable Conversion Price then in effect by a fraction:

(a) the numerator of which shall be the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance or the close of business on such record date, and

(b) the denominator of which shall be the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance or the close of business on such record date plus the number of shares of Common Stock issuable in payment of such dividend or distribution.

Notwithstanding the foregoing, (a) if such record date shall have been fixed and such dividend is not fully paid or if such distribution is not fully made on the date fixed therefor, the Conversion Prices shall be recomputed accordingly as of the close of business on such record date and thereafter the Conversion Prices shall be adjusted pursuant to this subsection as of the time of actual payment of such dividends or distributions; and (b) that no such adjustment shall be made if the holders of Preferred Stock simultaneously receive a dividend or other distribution of shares of Common Stock in a number equal to the number of shares of Common Stock as they would have received if all outstanding shares of Preferred Stock had been converted into Common Stock on the date of such event.

4.7 Adjustments for Other Dividends and Distributions. In the event the Corporation at any time or from time to time after the Series D1 Original Issue Date shall make or issue, or fix a record date for the determination of holders of Common Stock entitled to receive, a dividend or other distribution payable in securities of the Corporation (other than a distribution of shares of Common Stock in respect of outstanding shares of Common Stock) or in other property and the provisions of Section 1 do not apply to such dividend or distribution, then and in each such event the holders of Preferred Stock shall receive, simultaneously with the distribution to the holders of Common Stock, a dividend or other distribution of such securities or other property in an amount equal to the amount of such securities or other property as they would have received if all outstanding shares of Preferred Stock had been converted into Common Stock on the date of such event, subject to such dividend or other distribution having been ratified by the Board of Directors at the time of such dividend or distribution, as applicable (including by the approval of the Board of Directors of such dividend or distribution).

4.8 Adjustment for Merger or Reorganization, etc. Subject to the provisions of Section 2, if there shall occur any reorganization, recapitalization, reclassification, consolidation or merger involving the Corporation in which the Common Stock (but not the Preferred Stock) is converted into or exchanged for securities, cash or other property (other than a transaction covered by Subsections 4.5, 4.6 or 4.7), then, following any such reorganization, recapitalization, reclassification, consolidation or merger, each share of Preferred Stock shall thereafter be convertible in lieu of the Common Stock into which it was convertible prior to such event into the kind and amount of securities, cash or other property which a holder of the number of shares of Common Stock of the Corporation issuable upon conversion of one share of Preferred Stock immediately prior to such reorganization, recapitalization, reclassification, consolidation or merger would have been entitled to receive pursuant to such transaction; and, in such case, appropriate adjustment (as determined in good faith by the Board of Directors of the Corporation) shall be made in the application of the provisions in this Section 4 with respect to the rights and interests thereafter of the holders of the Preferred Stock, to the end that the provisions set forth in this Section 4 (including provisions with respect to changes in and other adjustments of the Conversion Prices) shall thereafter be applicable, as nearly as reasonably may be, in relation to any securities or other property thereafter deliverable upon the conversion of the Preferred Stock.

4.9 Certificate as to Adjustments. Upon the occurrence of each adjustment or readjustment of a Conversion Price pursuant to this Section 4, the Corporation at its expense shall, as promptly as reasonably practicable but in any event not later than 10 days thereafter, compute such adjustment or readjustment in accordance with the terms hereof and furnish to each holder of each applicable series of Preferred Stock a certificate setting forth such adjustment or readjustment (including the kind and amount of securities, cash or other property into which the applicable series of Preferred Stock is convertible) and showing in detail the facts upon which such adjustment or readjustment is based. The Corporation shall, as promptly as reasonably practicable after the written request at any time of any holder of Preferred Stock (but in any event not later than 10 days thereafter), furnish or cause to be furnished to such holder a certificate setting forth (i) the applicable Conversion Price then in effect, and (ii) the number of shares of Common Stock and the amount, if any, of other securities, cash or property which then would be received upon the conversion of the applicable series of Preferred Stock.

4.10 Notice of Record Date. In the event:

(a) the Corporation shall take a record of the holders of its Common Stock (or other capital stock or securities at the time issuable upon conversion of the Preferred Stock) for the purpose of entitling or enabling them to receive any dividend or other distribution, or to receive any right to subscribe for or purchase any shares of capital stock of any class or any other securities, or to receive any other security; or

(b) of any capital reorganization of the Corporation, any reclassification of the Common Stock of the Corporation, or any Deemed Liquidation Event; or

(c) of the voluntary or involuntary dissolution, liquidation or winding-up of the Corporation,

then, and in each such case, the Corporation will send or cause to be sent to the holders of the Preferred Stock a notice specifying, as the case may be, (i) the record date for such dividend, distribution or right, and the amount and character of such dividend, distribution or right, or (ii) the effective date on which such reorganization, reclassification, consolidation, merger, transfer, dissolution, liquidation or winding-up is proposed to take place, and the time, if any is to be fixed, as of which the holders of record of Common Stock (or such other capital stock or securities at the time issuable upon the conversion of the Preferred Stock) shall be entitled to exchange their shares of Common Stock (or such other capital stock or securities) for securities or other property deliverable upon such reorganization, reclassification, consolidation, merger, transfer, dissolution, liquidation or winding-up, and the amount per share and character of such exchange applicable to the Preferred Stock and the Common Stock. Unless waived by the Requisite Holders (which, for the purpose of this Subsection 4.10, is not subject to the Series C2/D2 Voting Restriction), such notice shall be sent at least 10 days prior to the record date or effective date for the event specified in such notice.

5. Mandatory Conversion.

5.1 Trigger Events.

(a) Immediately prior to (i) the closing of the sale of shares of Class A Common Stock to the public at a price of at least $3.60 per share (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Class A Common Stock) in a firm-commitment underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended, resulting in at least $100,000,000 of gross proceeds to the Corporation (a "**Qualified Public Offering**"), or (ii) the consummation of a Qualified SPAC Transaction, (A) (1) each share of Series A1 Preferred Stock, Series B1 Preferred Stock, Series C1 Preferred Stock and Series D1 Preferred Stock then outstanding shall automatically be converted into a number of shares of Class A Common Stock at the then effective conversion rate as calculated pursuant to Subsection 4.1.1 and (2) each share of Series C2 Preferred Stock and Series D2 Preferred Stock then outstanding shall automatically be converted into a number of shares of Class B Common Stock at the then effective conversion rate with respect to the conversion of the Series C2 Preferred Stock and Series D2 Preferred Stock into Class A Common Stock as calculated pursuant to Subsection 4.1.1; and (B) such shares may not be reissued by the Corporation. As used herein, a "**Qualified SPAC Transaction"** shall mean a SPAC Transaction (i) that ascribes a pre-transaction equity value of the Class A Common Stock of at least $3.60 per share (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Class A Common Stock), (ii) that results in gross proceeds to the Corporation, the SPAC or its successor entity in such transaction (through an equity financing transaction, including a "PIPE" transaction, consummated in connection with the closing of the transaction or from the cash held by the SPAC, after taking into account any redemptions from the SPAC's trust account) of at least $100,000,000, and (iii) immediately following which the common stock or share capital of the SPAC or its successor entity is listed on the Nasdaq Stock Market, the New York Stock Exchange or another exchange or marketplace approved by the Board of Directors.

(b) With respect to all shares of Preferred Stock, upon the date and time, or the occurrence of an event, specified by vote or written consent of (i) the Requisite Holders (subject to the Series C2/D2 Voting Restriction) and (ii) the Requisite Series D1/D2 Holders (subject to the Series C2/D2 Voting Restriction) (the time of such closing or the date and time specified or the time of the event specified in such vote or written consent is referred to herein as the "**Mandatory Conversion Time**"), (A) (1) all outstanding shares of Series A1 Preferred Stock, Series B1 Preferred Stock, Series C1 Preferred Stock and Series D1 Preferred Stock shall automatically be converted into shares of Class A Common Stock, at the then effective conversion rate as calculated pursuant to Subsection 4.1.1 and (2) all outstanding shares of Series C2 Preferred Stock and Series D2 Preferred Stock shall automatically be converted into shares of Class B Common Stock at the then effective conversion rate with respect to the conversion of the Series C2 Preferred Stock and Series D2 Preferred Stock into Class A Common Stock as calculated pursuant to Subsection 4.1.1 and (B) such shares may not be reissued by the Corporation (an automatic conversion event pursuant to Subsection 5.1(a) or this Subsection 5.1(b), an "**Automatic Conversion Event**").

(c) For the avoidance of doubt, upon automatic conversion of all outstanding shares of Preferred Stock into shares of Common Stock immediately prior to the consummation of a Qualified SPAC Transaction pursuant to Subsection 5.1(a), all rights of the Preferred Stock under Section 2 with respect to preferential payments (or any other payments that may otherwise differ from distributions to Common Stock) will terminate.

(d) If the voting securities held by the Series C2/D2 Initial Holders would otherwise represent at any time prior to a Restriction Removal Event ten percent (10%) or more of the combined voting power of the Corporation's outstanding voting securities, then, upon such occurrence, the minimum whole number of shares of Series C1 Preferred Stock and/or D1 Preferred Stock held by the Series C2/D2 Initial Holder as is required to be converted into shares of Series C2 Preferred Stock or Series D2 Preferred Stock, respectively, such that the voting securities held by the Series C2/D2 Initial Holders after such conversion would represent less than ten percent (10%) of the combined voting power of the Corporation's outstanding voting securities at any time prior to a Restriction Removal Event, shall be automatically converted into an equal number of fully paid and non-assessable shares of Series C2 Preferred Stock or Series D2 Preferred Stock, as applicable. If there is more than one (1) Series C2/D2 Initial Holder, the conversion set out in this Subsection 5.1(d) shall be pro rata based on the number of shares held by each such holder, treating for this purpose all such securities as if they had been converted to Class A Common Stock pursuant to the terms of the Certificate of Incorporation immediately prior to conversion.

(e) With respect to the Series C2 Preferred Stock and Series D2 Preferred Stock:

(i) Upon the sale, assignment, transfer or other disposition of any shares of Series C2 Preferred Stock to a person or entity other than the Series C2/D2 Initial Holder, each such outstanding share of Series C2 Preferred Stock shall be automatically converted into one fully paid and non-assessable share of Series C1 Preferred Stock. Upon the occurrence of a Restriction Removal Event, each share of Series C2 Preferred Stock then outstanding shall be automatically converted into one fully paid and non-assessable share of Series C1 Preferred Stock.

(ii) Upon the sale, assignment, transfer or other disposition of any shares of Series D2 Preferred Stock to a person or entity other than the Series C2/D2 Initial Holders, each such outstanding share of Series D2 Preferred Stock shall be automatically converted into one fully paid and non-assessable share of Series D1 Preferred Stock. Upon the occurrence of a Restriction Removal Event, each share of Series D2 Preferred Stock then outstanding shall be automatically converted into one fully paid and non-assessable share of Series D1 Preferred Stock.

5.2 Procedural Requirements. All holders of record of shares of Preferred Stock shall be sent written notice of the Mandatory Conversion Time and the place designated for mandatory conversion of all such shares of Preferred Stock pursuant to this Section 5. Such notice need not be sent in advance of the occurrence of the Mandatory Conversion Time. Upon receipt of such notice, each holder of shares of Preferred Stock shall surrender his, her or its certificate or certificates for all such shares (or, if such holder alleges that such certificate has been lost, stolen or destroyed, a lost certificate affidavit and agreement reasonably acceptable to the Corporation to indemnify the Corporation against any claim that may be made against the Corporation on account of the alleged loss, theft or destruction of such certificate) to the Corporation at the place designated in such notice. If so required by the Corporation, certificates surrendered for conversion shall be endorsed or accompanied by written instrument or instruments of transfer, in form satisfactory to the Corporation, duly executed by the registered holder or by his, her or its attorney duly authorized in writing. All rights with respect to the Preferred Stock converted pursuant to Subsection 5.1, including the rights, if any, to receive notices and vote (other than as a holder of Common Stock), will terminate at the Mandatory Conversion Time (notwithstanding the failure of the holder or holders thereof to surrender the certificates at or prior to such time), except only the rights of the holders thereof, upon surrender of their certificate or certificates (or lost certificate affidavit and agreement) therefor, to receive the items provided for in the next sentence of this Subsection 5.2. As soon as practicable after the Mandatory Conversion Time and the surrender of the certificate or certificates (or lost certificate affidavit and agreement) for Preferred Stock, the Corporation shall issue and deliver to such holder, or to his, her or its nominees, a certificate or certificates for, or a book-entry statement evidencing, the number of full shares of Common Stock issuable on such conversion in accordance with the provisions hereof, together with cash as provided in Subsection 4.2 in lieu of any fraction of a share of Common Stock otherwise issuable upon such conversion and the payment of any declared but unpaid dividends on the shares of Preferred Stock converted. Such converted Preferred Stock shall be retired and cancelled and may not be reissued as shares of such series, and the Corporation may thereafter take such appropriate action (without the need for stockholder action) as may be necessary to reduce the authorized number of shares of Preferred Stock accordingly.

6. Redemption.

6.1 General. Unless prohibited by Delaware law governing distributions to stockholders, shares of Preferred Stock shall be redeemed by the Corporation (the "**General Redemption**") at a price equal to, in the case of Series A1 Preferred Stock, the Series A1 Liquidation Preference per share (the "**General Series A1 Redemption Price**"), in the case of Series B1 Preferred Stock, the Series B1 Liquidation Preference per share (the "**General Series B1 Redemption Price**"), in the case of the Series C1 Preferred Stock, the Series C1 Liquidation Preference per share (the "**General Series C1 Redemption Price**"), in the case of the Series C2 Preferred Stock, the Series C2 Liquidation Preference per share (the "**General Series C2 Redemption Price**"), in the case of the Series D1 Preferred Stock, the Series D1 Liquidation Preference per share (the "**General Series D1 Redemption Price**"), and in the case of the Series D2 Preferred Stock, the Series D2 Liquidation Preference per share (the "**General Series D2 Redemption Price**" and, together with the General Series A1 Redemption Price, the General Series B1 Redemption Price, the General Series C1 Redemption Price and the General Series D1 Redemption Price, the "**General Redemption Prices**"), in three annual installments commencing not more than sixty (60) days after receipt by the Corporation of written notice, at any time on or after the fifth (5^{th}) anniversary of the Series D1 Original Issue Date, from the Requisite Holders (subject to the Series C2/D2 Voting Restriction), requesting redemption of all shares of Preferred Stock (the "**General Redemption Request**"); provided that, if such redemption requires approval of the Board of Directors, then such redemption shall have been ratified by the Board of Directors at the time of redemption (including by the approval of the Board of Directors of such redemption), and in any event such redemption shall be made pursuant to and in accordance with this Subsection 6.1, Subsection 6.3 and Subsection 6.4 of the Certificate of Incorporation, which has been approved by the Board of Directors, and any amendments or changes to this Subsection 6.1, Subsection 6.3 or Subsection 6.4 shall require, in addition to any stockholder approval required under the Certificate of Incorporation, the approval of the Board of Directors. Upon receipt of the General Redemption Request, the Corporation shall apply all of its assets to any such redemption, and to no other corporate purpose, except to the extent prohibited by Delaware law governing distributions to stockholders. The date of each such installment shall be referred to as a "**General Redemption Date**". On the first General Redemption Date, the Corporation shall redeem the shares of Preferred Stock in the amount equal to one-third (1/3) of the aggregate amount of the General Redemption Prices payable calculated as of the date of the first General Redemption Date. On the second General Redemption Date, the Corporation shall redeem the shares of Preferred Stock in the amount equal to fifty percent (50%) of the aggregate amount of the General Redemption Prices unpaid calculated as of the second General Redemption Date. On the third General Redemption Date, the Corporation shall redeem the shares of Preferred Stock in the amount equal to the aggregate amount of the General Redemption Prices unpaid calculated as of the third General Redemption Date. The Corporation shall redeem the shares of Preferred Stock in the following order of priority:

6.1.1 on each General Redemption Date, first among the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock, on a pari passu basis and pro rata based on the number of shares held by each such holder, treating for this purpose all such securities as if they had been converted to Common Stock pursuant to the terms of the Certificate of Incorporation immediately prior to such General Redemption Date, until (v) the holders of shares of Series D1 Preferred Stock have received an aggregate per share amount equal to the General Series D1 Redemption Price, (w) the holders of shares of Series D2 Preferred Stock have received an aggregate per share amount equal to the General Series D2 Redemption Price, (x) the holders of shares of Series C1 Preferred Stock have received an aggregate per share amount equal to the General Series C1 Redemption Price, (y) the holders of shares of Series C2 Preferred Stock have received an aggregate per share amount equal to the General Series C2 Redemption Price and (z) the holders of shares of Series B1 Preferred Stock have received an aggregate per share amount equal to the General Series B1 Redemption Price. If upon any such General Redemption Date, the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock the full amount to which they shall be entitled under this Subsection 6.1.1, the holders of shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

6.1.2 second, on (x) each General Redemption Date commencing on such General Redemption Date in which all of the shares of Series D1 Preferred Stock, Series D2 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock and Series B1 Preferred Stock have been redeemed in full pursuant to Subsection 6.1.1, and (y) each subsequent General Redemption Date (if applicable), among the holders of shares of Series A1 Preferred Stock, on a pari passu basis and pro rata based on the number of shares held by each such holder, until the holders of shares of Series A1 Preferred Stock have received an aggregate per share amount equal to the General Series A1 Redemption Price. If upon any General Redemption Date, the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series A1 Preferred Stock the full amount to which they shall be entitled under this Subsection 6.1.2, the holders of shares of Series A1 Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

If, on any General Redemption Date, Delaware law governing distributions to stockholders prevents the Corporation from redeeming all shares of Preferred Stock to be redeemed, the Corporation shall ratably redeem the maximum number of shares that it may redeem consistent with such law, and shall redeem the remaining shares as soon as it may lawfully do so under such law.

6.2 Special Redemption Right. In addition to the redemption right provided in Subsection 6.1, and unless prohibited by Delaware law governing distributions to stockholders, in the event that (i) the Corporation breaches any of the Specified Conditions (as defined in the amended and restated letter agreement between Colony Harvest Ltd ("**Colony Harvest**") and the Corporation, entered into on the April 28, 2020 (the "**Colony Harvest Letter**")) and (ii) the Corporation has not cured such breach by the date that is one (1) year following written notice to the Corporation specifying that such breach has occurred (the "**Cure Period**"), then Colony Harvest shall have the right to request in writing (the "**Special Redemption Request**") redemption of all shares of Preferred Stock outstanding and held by Colony Harvest as of the first day following the Cure Period (the "**Special Redemption**") at a price equal to two times (2x) the applicable Original Issue Price, plus any applicable Accruing Dividends accrued but unpaid on such shares of Preferred Stock, plus any other dividends declared but unpaid on such shares of Preferred Stock (collectively, the "**Special Redemption Price**" and, together with the General Redemption Prices and the Liquidation Redemption Prices, each a "**Redemption Price**"). The Special Redemption Price shall be payable in three annual installments commencing not more than sixty (60) days after receipt by the Corporation of the Special Redemption Request. The date of each such installment shall be referred to as a "**Special Redemption Date**" (and, together with the General Redemption Date and the Liquidation Redemption Dates, each a "**Redemption Date**"). In the event the Special Redemption Request is made in accordance with the terms of this Subsection 6.2, the Corporation shall notify all other holders of Preferred Stock of the Special Redemption Request (the "**Special Redemption Notice**") within ten (10) days after receipt of such request. The Requisite Holders (subject to the Series C2/D2 Voting Restriction) may elect for all holders of Preferred Stock to participate in the Special Redemption by delivering notice (the "**Participation Notice**") to the Corporation and each other holder of Preferred Stock within ten (10) days after the Corporation's delivery of the Special Redemption Notice. In such case, subject to the next sentence, all holders of Preferred Stock then outstanding shall participate in the Special Redemption alongside Colony Harvest on a pari passu basis pursuant to the applicable provisions of this Section 6. Notwithstanding the foregoing, if the Corporation receives, on or prior to the tenth (10^{th}) day following the date of delivery of the Participation Notice to a holder of Preferred Stock, written notice from such holder that such holder elects to be excluded from the Special Redemption provided in this Subsection 6.2, then the shares of Preferred Stock registered on the books of the Corporation in the name of such holder at the time of the Corporation's receipt of such notice shall not be redeemed pursuant to the provisions of this Subsection 6.2. If on any Special Redemption Date Delaware law governing distributions to stockholders prevents the Corporation from redeeming all shares of Preferred Stock to be redeemed, the Corporation shall ratably redeem the maximum number of shares that it may redeem consistent with such law, and shall redeem the remaining shares as soon as it may lawfully do so under such law.

6.3 Redemption Notice. The Corporation shall send written notice of the mandatory redemption (the "**Redemption Notice**") to each holder of record of Preferred Stock not less than 40 days prior to each Redemption Date. Each Redemption Notice shall state:

(a) the number of shares of Preferred Stock held by the holder that the Corporation shall redeem on the Redemption Date specified in the Redemption Notice;

(b) the Redemption Date and the applicable Redemption Price(s);

(c) the date upon which the holder's right to convert such shares terminates (as determined in accordance with Subsection 4.1); and

(d) that the holder is to surrender to the Corporation, in the manner and at the place designated, his, her or its certificate or certificates representing the shares of Preferred Stock to be redeemed.

6.4 Interest. If any shares of Preferred Stock are not redeemed for any reason on any Redemption Date, all such unredeemed shares shall remain outstanding and entitled to all the rights and preferences provided herein, and the Corporation shall pay interest on the Redemption Price applicable to such unredeemed shares at an aggregate per annum rate equal to ten percent (10%), with such interest to accrue daily in arrears and be compounded annually; provided, however, that in no event shall such interest exceed the maximum permitted rate of interest under applicable law (the "**Maximum Permitted Rate**"), provided, however, that the Corporation shall take all such actions as may be necessary, including without limitation, making any applicable governmental filings, to cause the Maximum Permitted Rate to be the highest possible rate. In the event any provision hereof would result in the rate of interest payable hereunder being in excess of the Maximum Permitted Rate, the amount of interest required to be paid hereunder shall automatically be reduced to eliminate such excess; provided, however, that any subsequent increase in the Maximum Permitted Rate shall be retroactively effective to the applicable Redemption Date to the extent permitted by law.

6.5 Surrender of Certificates; Payment. On or before the applicable Redemption Date, each holder of shares of Preferred Stock to be redeemed on such Redemption Date, unless such holder has exercised his, her or its right to convert such shares as provided in Section 4, shall surrender the certificate or certificates representing such shares (or, if such registered holder alleges that such certificate has been lost, stolen or destroyed, a lost certificate affidavit and agreement reasonably acceptable to the Corporation to indemnify the Corporation against any claim that may be made against the Corporation on account of the alleged loss, theft or destruction of such certificate) to the Corporation, in the manner and at the place designated in the Redemption Notice, and thereupon the applicable Redemption Price for such shares shall be payable to the order of the person whose name appears on such certificate or certificates as the owner thereof. In the event less than all of the shares of Preferred Stock represented by a certificate are redeemed, a new certificate representing the unredeemed shares of Preferred Stock shall promptly be issued to such holder.

6.6 Rights Subsequent to Redemption. If the Redemption Notice shall have been duly given, and if on the applicable Redemption Date the applicable Redemption Price payable upon redemption of the shares of Preferred Stock to be redeemed on such Redemption Date is paid or tendered for payment or deposited with an independent payment agent so as to be available therefor in a timely manner, then notwithstanding that the certificates evidencing any of the shares of Preferred Stock so called for redemption shall not have been surrendered, dividends with respect to such shares of Preferred Stock shall cease to accrue after such Redemption Date and all rights with respect to such shares shall forthwith after the Redemption Date terminate, except only the right of the holders to receive the applicable Redemption Price without interest upon surrender of their certificate or certificates therefor.

6.7 Suspension of Redemption Rights. Notwithstanding anything in this Certificate of Incorporation to the contrary, no shares of Preferred Stock shall have any rights of redemption until, and no Redemption Notice may be delivered, before the date that is 180 days after the date on which all Obligations (as defined in that certain loan and security agreement among the Corporation, Kennedy Lewis Management LP, in its capacity as collateral agent for the lenders party thereto (in such capacity, the "**Collateral Agent**"), and the other parties thereto, dated on or about May 14, 2020 (as amended and/or restated, supplemented or otherwise modified from time to time, the "**Loan Facility**")) have been paid in full in cash and the Loan Facility has been terminated pursuant to the terms therein (the "**Loan Restriction Qualification**"). For the avoidance of doubt, all shares of Preferred Stock, including any such shares that may be issued or subsequently transferred or assigned following May 14, 2020, shall be subject to the Loan Restriction Qualification. The holders of Preferred Stock and the Corporation acknowledge that the foregoing provisions are for the benefit of the Collateral Agent and that the Collateral Agent shall have rights as a third party beneficiary hereunder.

7. Redeemed or Otherwise Acquired Shares. Any shares of Preferred Stock that are redeemed or otherwise acquired by the Corporation or any of its subsidiaries shall be automatically and immediately cancelled and retired and shall not be reissued, sold or transferred. Neither the Corporation nor any of its subsidiaries may exercise any voting or other rights granted to the holders of Preferred Stock following redemption.

8. Waiver. Except as otherwise expressly set forth herein, any of the rights, powers, preferences and other terms of the Preferred Stock set forth herein may be waived on behalf of all holders of Preferred Stock by the affirmative written consent or vote of the Requisite Holders (subject to the Series C2/D2 Voting Restriction); provided that (a) any waiver that would adversely affect the Series A1 Preferred Stock in a manner differently from the other series of Preferred Stock shall require the affirmative written consent of holders of a majority of the outstanding shares of Series A1 Preferred Stock, (b) any waiver that would adversely affect the Series B1 Preferred Stock in a manner differently from the other series of Preferred Stock shall require the affirmative written consent of the Requisite Series B1 Holders, (c) any waiver that would adversely affect the Series C1 Preferred Stock and Series C2 Preferred Stock in a manner differently from the other series of Preferred Stock shall require the affirmative written consent of holders of a majority of the Series C1 Preferred Stock and Series C2 Preferred Stock, voting together as a single class, (d) any waiver that would adversely affect the Series D1 Preferred Stock and Series D2 Preferred Stock in a manner differently from the other series of Preferred Stock shall require the affirmative written consent of holders of a majority of the Series D1 Preferred Stock and Series D2 Preferred Stock, voting together as a single class, and (e) any waiver of Subsection 6.2 hereof shall require the prior written consent of each of the parties to the Colony Harvest Letter.

9. Notices. Any notice required or permitted by the provisions of this Article Fourth to be given to a holder of shares of Preferred Stock shall be mailed, postage prepaid, to the post office address last shown on the records of the Corporation, or given by electronic communication in compliance with the provisions of the General Corporation Law, and shall be deemed sent upon such mailing or electronic transmission.

FIFTH: Subject to any additional vote required by the Certificate of Incorporation or Bylaws, in furtherance and not in limitation of the powers conferred by statute, the Board of Directors is expressly authorized to make, repeal, alter, amend and rescind any or all of the Bylaws of the Corporation.

SIXTH: Subject to any additional vote required by the Certificate of Incorporation, the number of directors of the Corporation shall be determined in the manner set forth in the Bylaws of the Corporation.

Unless otherwise required by applicable law or this Certificate of Incorporation, each director shall have one vote on all matters presented to the Board of Directors for consideration and voting by the directors. If the Board of Directors has an even number of directors then in office and considers and votes on any matter at a duly-convened meeting to consider such matter and (i) all of the directors then in office are present and vote at such duly convened meeting, (ii) such vote results in an equal number of the directors voting in favor of such matter and against such matter (a "**Deadlock**"), and (iii) approval of such matter requires a majority vote in favor of such matter by the directors present at such meeting, then in such case the director then serving as the Corporation's Chief Executive Officer shall have the power and authority to cast an additional vote on such matter for the purpose of breaking the Deadlock.

With respect to any committee established by the Board of Directors, unless otherwise required by applicable law, each director serving on such committee shall have one vote on all matters presented to such committee for its consideration and voting by the directors who are members of such committee.

SEVENTH: Elections of directors need not be by written ballot unless the Bylaws of the Corporation shall so provide.

EIGHTH: Meetings of stockholders may be held within or without the State of Delaware, as the Bylaws of the Corporation may provide. The books of the Corporation may be kept outside the State of Delaware at such place or places as may be designated from time to time by the Board of Directors or in the Bylaws of the Corporation.

NINTH: To the fullest extent permitted by law, a director of the Corporation shall not be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director. If the General Corporation Law or any other law of the State of Delaware is amended after approval by the stockholders of this Article Ninth to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of the Corporation shall be eliminated or limited to the fullest extent permitted by the General Corporation Law as so amended.

Any repeal or modification of the foregoing provisions of this Article Ninth by the stockholders of the Corporation shall not adversely affect any right or protection of a director of the Corporation existing at the time of, or increase the liability of any director of the Corporation with respect to any acts or omissions of such director occurring prior to, such repeal or modification.

TENTH: To the fullest extent permitted by applicable law, the Corporation is authorized to provide indemnification of (and advancement of expenses to) directors, officers and agents of the Corporation (and any other persons to which General Corporation Law permits the Corporation to provide indemnification) through Bylaw provisions, agreements with such agents or other persons, vote of stockholders or disinterested directors or otherwise, in excess of the indemnification and advancement otherwise permitted by Section 145 of the General Corporation Law.

Any amendment, repeal or modification of the foregoing provisions of this Article Tenth shall not adversely affect any right or protection of any director, officer or other agent of the Corporation existing at the time of such amendment, repeal or modification.

ELEVENTH: The Corporation renounces any interest or expectancy of the Corporation in, or in being offered an opportunity to participate in, any Excluded Opportunity. An "**Excluded Opportunity**" is any matter, transaction or interest that is presented to, or acquired, created or developed by, or which otherwise comes into the possession of, (i) any director of the Corporation who is not an employee of the Corporation or any of its subsidiaries, or (ii) any holder of Preferred Stock or any partner, member, director, stockholder, employee or agent of any such holder, other than someone who is an employee of the Corporation or any of its subsidiaries (collectively, "**Covered Persons**"), unless such matter, transaction or interest is presented to, or acquired, created or developed by, or otherwise comes into the possession of, a Covered Person in such Covered Person's capacity as a director of the Corporation.

* * *

3. That the foregoing amendment and restatement was approved by the holders of the requisite number of shares of this corporation in accordance with Section 228 of the General Corporation Law.

4. That this Ninth Amended and Restated Certificate of Incorporation, which restates and integrates and further amends the provisions of this corporation's Certificate of Incorporation, has been duly adopted in accordance with Sections 242 and 245 of the General Corporation Law.

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IN WITNESS WHEREOF, this Ninth Amended and Restated Certificate of Incorporation has been executed by a duly authorized officer of this corporation on this 25th day of June, 2021.

By: /s/ Robert Spignesi
President and Chief Executive Officer

Exhibit 3.2

BYLAWS

OF

RAPID MICRO BIOSYSTEMS, INC.

ARTICLE 1

OFFICES

SECTION 1.01. *Registered Office.* The registered office of Rapid Micro Biosystems, Inc., a Delaware corporation (the "Corporation"), in the State of Delaware shall be located at 1209 Orange Street, in the City of Wilmington, County of New Castle. The name and of the Corporation's registered agent at such address is The Corporation Trust Company.

SECTION 1.02. *Other Offices.* The Corporation may also have offices at such other places both within and without the State of Delaware as the Board of Directors may from time to time determine or the business of the Corporation may require.

SECTION 1.03. *Books.* The books of the Corporation may be kept within or without the State of Delaware as the Board of Directors may from time to time determine or the business of the Corporation may require.

ARTICLE 2

MEETINGS OF STOCKHOLDERS

SECTION 2.01. *Time and Place of Meetings.* (a) All meetings of stockholders shall be held at such place, either within or without the State of Delaware, on such date and at such time as may be determined from time to time by the Board of Directors (or the Chairman in the absence of a designation by the Board of Directors).

(b) The Board of Directors, in its sole discretion, may determine that such meetings be held solely by means of remote communication. For any meeting of stockholders to be held by remote communication, the Corporation shall (i) implement reasonable measures to verify that each person deemed present and permitted to vote at the meeting by remote communication is a stockholder or proxyholder, (ii) implement reasonable measures to provide such stockholders and proxyholders a reasonable opportunity to participate in the meeting and to vote on matters submitted to the stockholders, including an opportunity to read or hear the proceedings of the meeting substantially concurrently with such proceedings, and (iii) if any stockholder or proxyholder votes or takes other action at the meeting by means of remote communication, a record of such vote or other action shall be maintained by the Corporation.

SECTION 2.02. *Annual Meetings.* An annual meeting of stockholders, commencing with the year 2007 shall be held for the election of directors and for the transaction of such other business as may properly be brought before such meeting. Stockholders may, unless the Certificate of Incorporation otherwise provides, act by written consent to elect directors; *provided, however,* that, if such consent is less than unanimous, such action by written consent may be in lieu of holding an annual meeting only if all of the directorships to which directors could be elected at an annual meeting held at the effective time of such action are vacant and are filled by such action.

SECTION 2.03. *Special Meetings.* Special meetings of stockholders for any proper purpose or purposes may be called at any time by the Board of Directors or the Chairman of the Board of Directors and shall be called by the Secretary of the Corporation whenever the stockholders of record owning a majority of the then issued and outstanding capital stock of the Corporation entitled to vote on matters to be submitted to stockholders of the Corporation shall request therefor (either by written instrument signed by a majority, by resolution adopted by a vote of the majority or by a ballot submitted by electronic transmission, provided that any such electronic transmission shall set forth or be submitted with information from which it can be determined that the electronic transmission was authorized by the stockholder or proxyholder). Any such written request shall state a proper purpose or purposes of the meeting and shall be delivered to the President or Secretary of the Corporation.

SECTION 2.04. *Notice of Meetings and Adjourned Meetings; Waivers of Notice.* (a) Whenever stockholders are required or permitted to take any action at a meeting, a notice of the meeting of stockholders shall be given which shall state the hour, means of remote communication, if any, date and place, if any, thereof, and, in the case of a special meeting, the purpose or purposes for which the meeting is called shall, and in the case of an annual meeting may, also be stated in such notice. Unless otherwise provided by law, such notice shall be delivered either personally or by mail, not less than ten (10) nor more than sixty (60) days before the date of the meeting, to each stockholder of record entitled to vote at such meeting. Unless these bylaws otherwise require, when a meeting is adjourned to another time or place (whether or not a quorum is present), notice need not be given of the adjourned meeting if the time and place thereof are announced at the meeting at which the adjournment is taken. At the adjourned meeting, the Corporation may transact any business which might have been transacted at the original meeting. If the adjournment is for more than 30 days, or after the adjournment a new record date is fixed for the adjourned meeting, a notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting.

(b) A written waiver of any such notice signed by the person entitled thereto, whether before or after the time stated therein, shall be deemed equivalent to notice. Attendance of an individual at a meeting in person, by proxy, or by remote communication shall constitute a waiver of notice of such meeting, except when the person attends the meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Business transacted at any special meeting of stockholders shall be limited to the purposes stated in the notice.

SECTION 2.05. *Quorum*. Unless otherwise provided under the Certificate of Incorporation or these bylaws and subject to Delaware Law, the presence, in person, by proxy, or by remote communication, of the holders of record of a majority of the then issued and outstanding capital stock of the Corporation entitled to vote at a meeting of stockholders shall be necessary and sufficient to constitute a quorum for the transaction of business. If, however, such quorum shall not be present or represented at any meeting of the stockholders, any officer entitled to preside at or act as secretary of a meeting of stockholders shall adjourn the meeting, without notice other than announcement at the meeting, until a quorum shall be present or represented. At such adjourned meeting at which a quorum shall be present or represented any business may be transacted which might have been transacted at the meeting as originally notified.

SECTION 2.06. *Voting and Proxies.* (a) Unless otherwise provided in the Certificate of Incorporation and subject to Delaware Law, the holder of Common Stock of the Corporation shall be entitled to one vote for each then issued and outstanding share of Common Stock held by such stockholder. Any share of Preferred Stock of the Corporation, unless otherwise provided for in the Certificate of Incorporation or a certificate of designation, and any share of capital stock of the Corporation held by the Corporation shall have no voting rights. Unless otherwise provided in Delaware Law, the Certificate of Incorporation or these bylaws, the affirmative vote of a majority of the shares of Common Stock of the Corporation present, in person, by means of remote communication, or by written proxy, at a meeting of stockholders and entitled to vote on the subject matter shall be the act of the stockholders.

(b) Any stockholder entitled to vote at a meeting of stockholders or to express consent or dissent to a corporate action in writing without a meeting may authorize another person or persons to act for him by written proxy, provided that the instrument authorizing such proxy to act shall have been executed in writing (which shall include faxing, telegraphing or cabling) or by electronic transmission by the stockholder himself or by such stockholder's duly authorized attorney and no such proxy shall be voted or acted upon after three (3) years from its date of authorization, unless the proxy provides for a longer period.

SECTION 2.07. *Action by Consent.* (a) Unless otherwise provided in the Certificate of Incorporation, any action required to be taken at any annual or special meeting of stockholders, or any action which may be taken at any annual or special meeting of stockholders, may be taken without a meeting, without prior notice and without a vote, if a consent or consents in writing, setting forth the action so taken, shall be signed by the holders of outstanding capital stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all shares entitled to vote thereon were present and voted and shall be delivered to the Corporation by delivery to its registered office in Delaware, its principal place of business, **or** an officer or agent of the Corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to the Corporation's registered office shall be by hand or by certified or registered mail, return receipt requested. Prompt notice of the taking of the corporate action without a meeting by less than unanimous written consent shall be given to those stockholders who have not consented in writing and who, if the action had been taken at a meeting, would have been entitled to notice of the meeting if the record date for such meeting had been the date that written consents signed by a sufficient number of stockholders to take the action were delivered to the Corporation as provided in Section 2.07(b).

(b) Every written consent shall bear the date of signature of each stockholder who signs the consent, and no written consent shall be effective to take the corporate action referred to therein unless, within sixty (60) days of the earliest dated consent delivered in the manner required by this Section and Delaware Law to the Corporation, written consents signed by a sufficient number of holders to take action are delivered to the Corporation by delivery to its registered office in Delaware, its principal place of business, or an officer or agent of the Corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to the Corporation's registered office shall be by hand or by certified or registered mail, return receipt requested.

(c) A telegram, cablegram or other electronic transmission consenting to an action to be taken and transmitted by a stockholder or proxyholder, or by a person or persons authorized to act for a stockholder or proxyholder, shall be deemed to be written, signed and dated for the purpose of this Section 2.07, provided that any such telegram, cablegram or other electronic transmission sets forth or is delivered with information from which the Corporation can determine (i) that the telegram, cablegram or other electronic transmission was transmitted by the stockholder or proxyholder or by a person or persons authorized to act for the stockholder or proxyholder, and (ii) the date on which such stockholder or proxyholder or authorized person or persons transmitted such telegram, cablegram or electronic transmission. The date on which such telegram, cablegram or electronic transmission is transmitted shall be deemed to be the date on which such consent was signed. No consent given by telegram, cablegram or other electronic transmission shall be deemed to have been delivered until such consent is reproduced in paper form and until such paper form shall be delivered to the Corporation by delivery to its registered office, its principal place of business or an officer or agent of the Corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to the Corporation's registered office for written consents shall be made by hand or by certified or registered mail, return receipt requested. Notwithstanding the foregoing limitations on delivery, consents given by telegram, cablegram or other electronic transmission may be otherwise delivered to the principal place of business of the Corporation or to an office or agent of the Corporation having custody of the book in which proceedings of meetings of stockholders are recorded if, to the extent and in the manner provided by resolution of the Board of Directors.

(d) Any copy, facsimile or other reliable reproduction of a consent in writing may be substituted or used in lieu of the original writing for any and all purposes for which the original writing could be used, provided that such copy, facsimile or other reproduction shall be a complete reproduction of the entire original writing.

SECTION 2.08. *Organization.* At each meeting of stockholders, the Chairman of the Board of Directors, if one shall have been elected, or in his absence or if one shall not have been elected, the director designated by the vote of the majority of the shareholders present at such meeting, shall act as chairman of the meeting. The Secretary of the Corporation (or in his absence or inability to act, the person whom the chairman of the meeting shall appoint secretary of the meeting) shall act as secretary of the meeting and keep the minutes thereof.

SECTION 2.09. *Order of Business.* The order of business at all meetings of stockholders shall be as determined by the chairman of the meeting.

SECTION 2.10. *Inspectors of Election.* (a) The Board of Directors, in advance of any meeting of the stockholders, may appoint one or more inspectors to act at the meeting or any adjournment thereof. If any of the inspectors so appointed shall fail to appear or act or if inspectors shall not have been so appointed, the person presiding at a meeting of the stockholders may, and on the request of any stockholder entitled to vote thereat shall, appoint one or more inspectors. Each inspector, before entering upon the discharge of his or her duties, shall take and sign an oath faithfully to execute the duties of inspector at such meeting with strict impartiality and according to the best of his or her ability.

(b) The inspectors, if so appointed, shall determine the number of shares of capital stock outstanding and the voting power of each, the shares represented at the meeting, the existence of a quorum, and the validity and effect of proxies, and shall receive votes, ballots or consents, hear and determine all challenges and questions arising in connection with the right to vote, count and tabulate all votes, ballots or consents, determine the result, and do such acts as are proper to conduct the election or vote with fairness to all stockholders. On request of the person presiding at the meeting or any stockholder entitled to vote thereat, the inspectors shall make a report in writing of any challenge, question or matter determined by them and execute a certificate of any fact found by them. No director or candidate for office shall act as an inspector of an election of directors.

SECTION 2.11. *Lists of Stockholders.* The officer who has charge of the stock ledger of the Corporation shall prepare and make, at least ten (10) days before every meeting of the stockholders, a complete list of the stockholders entitled to vote at the meeting, arranged in alphabetical order, showing the address of each stockholder and the number and class of shares held by each. Nothing contained in this Section 2.11 shall require the Corporation to include electronic mail addresses or other electronic contact information on such list. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting for a period of at least ten (10) days prior to the meeting: (i) on a reasonably accessible electronic network, provided that the information required to gain access to such list is provided with the notice of the meeting, or (ii) during ordinary business hours, at the principal place of business of the Corporation. In the event that the Corporation determines to make the list available on an electronic network, the Corporation may take reasonable steps to ensure that such information is available only to stockholders of the Corporation. If the meeting is to be held at a place, then the list shall be produced and kept at the time and place of the meeting during the whole time thereof, and may be inspected by any stockholder who is present. If the meeting is to be held solely by means of remote communication, then the list shall also be open to the examination of any stockholder during the whole time of the meeting on a reasonably accessible electronic network, and the information required to access such list shall be provided with the notice of the meeting.

ARTICLE 3

DIRECTORS

SECTION 3.01. *General Powers.* Except as otherwise provided in Delaware Law or the Certificate of Incorporation, the business and affairs of the Corporation shall be managed by or under the direction of the Board of Directors.

SECTION 3.02. *Number, Election and Term of Office.* (a) The number of directors which shall constitute the whole Board shall be fixed from time to time by resolution of the Board of Directors but shall not be fewer than one (1) nor more than twelve (12). The directors shall be elected at the annual meeting of the stockholders, and each director so elected shall hold office until his successor is elected and qualified or until his earlier death, resignation or removal. Directors need not be stockholders.

(b) All elections of directors shall be held by written ballot, except as provided in the Certificate of Incorporation, or Section 2.02 and Section 3.12 herein; if authorized by the Board of Directors, such requirement of a written ballot shall be satisfied by a ballot submitted by electronic transmission, provided that any such electronic transmission must either set forth or be submitted with information from which it can be determined that the electronic transmission was authorized by the stockholder or proxy holder.

SECTION 3.03. *Quorum and Manner of Acting.* Unless the Certificate of Incorporation or these bylaws require a greater number, a majority of the total number of directors shall constitute a quorum for the transaction of business, and the affirmative vote of a majority of the directors deemed to be present at a meeting at which a quorum is present shall be the act of the Board of Directors. When a meeting is adjourned to another time or place, if any (whether or not a quorum is present), notice need not be given of the adjourned meeting if the time and place thereof are announced at the meeting at which the adjournment is taken. At the adjourned meeting, the Board of Directors may transact any business which might have been transacted at the original meeting. If a quorum shall not be present at any meeting of the Board of Directors the directors present thereat shall adjourn the meeting, from time to time, without notice other than announcement at the meeting, until a quorum shall be present.

SECTION 3.04. *Time and Place of Meetings.* The Board of Directors shall hold its meetings at such place, either within or without the State of Delaware, or by remote communication, and at such time as may be determined from time to time by the Board of Directors (or the Chairman in the absence of a determination by the Board of Directors).

SECTION 3.05. *Annual Meeting.* The Board of Directors shall meet for the purpose of organization, the election of officers and the transaction of other business, as soon as practicable after each annual meeting of stockholders, on the same day and at the same place where such annual meeting shall be held. Notice of such meeting need not be given. In the event such annual meeting is not so held, the annual meeting of the Board of Directors may be held at such place either within or without the State of Delaware, or by remote communication, on such date and at such time as shall be specified in a notice thereof given as hereinafter provided in Section 3.07 herein or in a waiver of notice thereof signed by any director who chooses to waive the requirement of notice.

SECTION 3.06. *Regular Meetings.* After the place and time of regular meetings of the Board of Directors shall have been determined and notice thereof shall have been once given to each member of the Board of Directors, regular meetings may be held without further notice being given. Regular meetings shall be held at least quarterly for each calendar year.

SECTION 3.07. *Special Meetings.* Special meetings of the Board of Directors may be called by the Chairman of the Board or the President and shall be called by the Chairman of the Board, President or Secretary on the written request of a majority of the directors. Notice of special meetings of the Board of Directors shall be given to each director at least one (1) day before the date of the meeting in such manner as is determined by the Board of Directors. A written waiver of any such notice, signed by the director entitled hereto, whether before or after the time stated therein, shall be deemed equivalent to notice. Attendance of a director at a meeting shall constitute a waiver of notice of such meeting, except when the director attends the meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened.

SECTION 3.08. *Committees.* The Board of Directors may, by resolution passed by a majority of the whole Board, designate one or more committees, each committee to consist of one or more of the directors of the Corporation. The Board of Directors shall establish and maintain a compensation committee, a budget committee and an audit committee. The Board of Directors may designate one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee. In the absence or disqualification of a member of a committee, the member or members present at any meeting and not disqualified from voting, whether or not such member or members constitute a quorum, may unanimously appoint another member of the Board of Directors to act at the meeting in the place of any such absent or disqualified member. Any such committee, to the extent provided in the resolution of the Board of Directors, shall have and may exercise all the powers and authority of the Board of Directors in the management of the business and affairs of the Corporation, and may authorize the seal of the Corporation to be affixed to all papers which may require it; but no such committee shall have the power or authority in reference to the following matters: (i) approving or adopting, or recommending to the stockholders, any action or matter expressly required by Delaware Law to be submitted to the stockholders for approval, (ii) adopting, amending or repealing any bylaw of the Corporation, (iii) amending the Certificate of Incorporation, (iv) adopting an agreement of merger or consolidation, (v) recommending to the stockholders the sale, lease or exchange of all or substantially all of the Corporation's property and assets, or (vi) recommending to the stockholders a dissolution of the Corporation or a revocation of a dissolution and unless the resolution of the Board of Directors or the Certificate of Incorporation expressly so provide, no such committee shall have the power or authority to declare a dividend or to authorize the issuance of stock. Each committee shall keep regular minutes of its meetings and report the same to the Board of Directors when required.

SECTION 3.09. *Action by Consent.* Unless otherwise restricted by the Certificate of Incorporation or these bylaws, any action required or permitted to be taken at any meeting of the Board of Directors or of any committee thereof may be taken without a meeting, if all members of the Board or committee, as the case may be, consent thereto in writing or by electronic transmission, and the writing or writings or electronic transmission or transmissions are filed with the minutes of the proceedings of the Board, or committee. Such filings shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form.

SECTION 3.10. *Telephonic or Electronic Meetings.* Unless otherwise restricted by the Certificate of Incorporation or these bylaws, members of the Board of Directors, or any committee designated by the Board of Directors, may participate in a meeting of the Board of Directors, or such committee, as the case may be, by means of conference telephone, remote communication, or similar communications equipment by means of which all persons participating in the meeting can hear, speak, and/or communicate with each other, and such participation in a meeting shall constitute presence in person at the meeting.

SECTION 3.11. *Resignation.* Any director may resign at any time by giving written notice to the Board of Directors or to the Secretary of the Corporation. The resignation of any director shall take effect upon receipt of notice thereof or at such later time as shall be specified in such notice; and unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective.

SECTION 3.12. *Vacancies.* Unless otherwise provided in the Certificate of Incorporation, vacancies and newly created directorships resulting from any increase in the authorized number of directors to be elected by all the stockholders having the right to vote as a single class may be filled by a majority of the directors then in office, although less than a quorum, or by a sole remaining director. Whenever the holders of any class or classes of stock or series thereof are entitled to elect one or more directors by the Certificate of Incorporation, vacancies and newly created directorships of such class or classes or series may be filled by a majority of directors elected by such class or classes or series thereof then in office, or by a sole remaining director so elected. Each director so chosen shall hold office until his successor is elected and qualified, or until his earlier death, resignation or removal. If there are no directors in office, then an election of directors may be held in accordance with Delaware Law. Unless otherwise provided in the Certificate of Incorporation, when one or more directors shall resign from the Board of Directors, effective at a future date, a majority of the directors then in office shall have the power to fill such vacancy or vacancies, the vote thereon to take effect when such resignation or resignations shall become effective, and each director so chosen shall hold office as provided in the filling of other vacancies.

SECTION 3.13. *Removal.* Any director or the entire Board of Directors may be removed, with or without cause, at any time by the affirmative vote of the holders of a majority of the outstanding capital stock of the Corporation entitled to vote and the vacancies thus created may be filled in accordance with Section 3.12 herein.

SECTION 3.14. *Compensation.* Unless otherwise restricted by the Certificate of Incorporation or these bylaws, the Board of Directors shall have authority to fix the compensation of directors, including fees and reimbursement of expenses.

ARTICLE 4

OFFICERS

SECTION 4.01. *Title.* The principal officers of the Corporation shall be a President, one or more Vice Presidents, a Treasurer and a Secretary, and such other officers with such other titles as the Board of Directors shall determine. One person may hold the offices and perform the duties of any two or more of said offices.

SECTION 4.02. *Election, Term of Office and Remuneration.* The principal officers of the Corporation shall be elected annually by the Board of Directors at the annual meeting thereof. Each such officer shall hold office until his successor is elected and qualified, or until his earlier death, resignation or removal. The remuneration of all officers of the Corporation shall be fixed by the Board of Directors. Any vacancy in any office shall be filled in such manner as the Board of Directors shall determine.

SECTION 4.03. *Subordinate Officers.* In addition to the principal officers enumerated in Section 4.01 herein, the Corporation may have one or more Assistant Treasurers, Assistant Secretaries and Assistant Controllers and such other subordinate officers, agents and employees as the Board of Directors may deem necessary, each of whom shall hold office for such period as the Board of Directors may from time to time determine. The Board of Directors may delegate to any principal officer the power to appoint and to remove any such subordinate officers, agents or employees.

SECTION 4.04. *Removal.* Except as otherwise permitted with respect to subordinate officers, any officer may be removed, with or without cause, at any time, by resolution adopted by the Board of Directors.

SECTION 4.05. *Resignations.* Any officer may resign at any time by giving written notice to the Board of Directors (or to a principal officer if the Board of Directors has delegated to such principal officer the power to appoint and to remove such officer). The resignation of any officer shall take effect upon receipt of notice thereof or at such later time as shall be specified in such notice; and unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective.

SECTION 4.06. *Powers and Duties.* The officers of the Corporation shall have such powers and perform such duties incident to each of their respective offices and such other duties as may from time to time be conferred upon or assigned to them by the Board of Directors.

SECTION 4.07. *President and Vice-Presidents.* The President shall be the chief executive officer of the Corporation, shall preside at all meetings of the stockholders and the Board of Directors unless a Chairman or Vice-chairman of the Board is elected by the Board, empowered to preside, and present at such meeting, shall have general and active management of the business of the Corporation and general supervision of its officers, agents and employees, and shall see that all orders and resolutions of the Board of Directors are carried into effect. In the absence of the President or in the event of his or her inability or refusal to act, the Vice-President if any (or if there be more than one Vice-President, the Vice-Presidents in the order designated by the directors, or in the absence of any designation, then in the order of their election) shall perform the duties of the President, and when so acting, shall have all the powers of and be subject to all the restrictions upon the President. The Board of Directors may assign to any Vice-President the title of Executive Vice-President, Senior Vice-President or any other title selected by the Board of Directors.

SECTION 4.08. *Secretary and Assistant Secretaries.* The Secretary shall attend all meetings of the Board of Directors and of the stockholders and record all the proceedings of such meetings in a book to be kept for that purpose, shall give, or cause to be given, notice of all meetings of the stockholders and special meetings of the Board of Directors, shall maintain a stock ledger and prepare lists of stockholders and their addresses as required and shall have custody of the corporate seal which the Secretary or any Assistant Secretary shall have authority to affix to any instrument requiring it and attest by any of their signatures. The Board of Directors may give general authority to any other officer to affix and attest the seal of the Corporation. The Assistant Secretary if any (or if there by more than one, the Assistant Secretaries in the order determined by the Board of Directors or if there be no such determination, then in the order of their election) shall, in the absence of the Secretary or in the event of the Secretary's inability or refusal to act, perform the duties and exercise the powers of the Secretary.

SECTION 4.09. *Treasurer and Assistant Treasurers.* The Treasurer shall have the custody of the corporate funds and securities, shall keep full and accurate accounts of receipts and disbursements in books belonging to the Corporation and shall deposit all moneys and other valuable effects in the name and to the credit of the Corporation in such depositories as may be designated by the Board of Directors. The Treasurer shall disburse the funds of the Corporation as may be ordered by the Board of Directors or the President, taking proper vouchers for such disbursements, and shall render to the President and the Board of Directors, at its regular meetings, or whenever they may require it, an account of all transactions and of the financial condition of the Corporation. The Assistant Treasurer if any (or if there be more than one, the Assistant Treasurers in the order determined by the Board of Directors or if there be no such determination, then in the order of their election) shall, in the absence of the Treasurer or in the event of his or her inability or refusal to act, perform the duties and exercise the powers of the Treasurer.

SECTION 4.10. *Bonded Officers.* The Board of Directors may require any officer to give the Corporation a bond in such sum and with such surety or sureties as shall be satisfactory to the Board of Directors upon such terms and conditions as the Board of Directors may specify, including without limitation a bond for the faithful performance of the duties of such officer and for the restoration to the Corporation of all property in his or her possession or control belonging to the Corporation.

ARTICLE 5

EXECUTION OF INSTRUMENTS AND DEPOSIT OF CORPORATE FUNDS

SECTION 5.01. *Execution of Instruments Generally.* The Board of Directors may authorize any officer or officers, or agent or agents, to enter into any contract or execute and deliver any instrument in the name and on behalf of the Corporation, and such authorization may be general or confined to specific instances.

SECTION 5.02. *Borrowing.* No loans or advance shall be obtained or contracted for, by or on behalf of the Corporation and no negotiable paper shall be issued in its name, unless and except as authorized by the Board of Directors. Such authorization may be general or confined to specific instances. Any officer or agent of the Corporation thereunto so authorized may obtain loans and advances for the Corporation, and for such loans and advances may make, execute and deliver promissory notes, bonds, or other evidences of indebtedness of the Corporation. Any officer or agent of the Corporation thereunto so authorized may pledge, hypothecate or transfer as security for the payment of any and all loans, advances, indebtedness and liabilities of the Corporation, any and all stocks, bonds, other securities and other personal property at any time held by the Corporation, and to that end may endorse, assign and deliver the same and do every act and thing necessary or proper in connection therewith.

SECTION 5.03. *Deposits.* All funds of the Corporation not otherwise employed shall be deposited from time to time to its credit in such banks or trust companies or with such bankers or other depositories as the Board of Directors may select, or as may be selected by any officer or officers or agent or agents authorized so to do by the Board of Directors. Endorsements for deposit to the credit of the Corporation in any of its duly authorized depositories shall be made in such manner as the Board of Directors from time to time may determine.

SECTION 5.04. *Checks, Drafts, etc.* All checks, drafts or other orders for the payment of money, and all notes or other evidences of indebtedness issued in the name of the Corporation, shall be signed by such officer or officers or agent or agents of the Corporation, and in such manner, as from time to time shall be determined by the Board of Directors.

SECTION 5.05. *Proxies.* Proxies to vote with respect to shares of stock of other corporations owned by or standing in the name of the Corporation may be executed and delivered from time to time on behalf of the Corporation by the President or by any other person or persons thereunto authorized by the Board of Directors.

SECTION 5.06. *Other Contracts and Instruments.* All other contracts and instruments binding the Corporation shall be executed in the name and on the behalf of the Corporation by those officers, employees or agents of the Corporation as may be authorized by the Board of Directors. That authorization may be general or confirmed to specific instances.

ARTICLE 6

CERTIFICATES OF STOCK

SECTION 6.01. *Form and Execution of Certificates.* The interest of each stockholder of the Corporation shall be evidenced by a certificate or certificates for shares of stock in such form as the Board of Directors may from time to time prescribe. The certificates of stock of each class shall be consecutively numbered and signed by the Chairman of the Board or the Chief Executive Officer and by the President or the Treasurer or an Assistant Treasurer or the Secretary or an Assistant Secretary, and shall bear the corporate seal or a printed or engraved facsimile thereof. Any or all of the signatures on the certificate may be a facsimile. The Board of Directors shall have the power to appoint one or more transfer agents and/or registrars for the transfer or registration of certificates of stock of any class, and may require stock certificates to be countersigned or registered by one or more of such transfer agents and/or registrars.

SECTION 6.02. *Transfer of Shares.* The shares of the stock of the Corporation shall be transferrable on the books of the Corporation by the holder thereof in person or by his or her attorney lawfully constituted, upon surrender for cancellation of certificates for the same number of shares, with an assignment and power of transfer endorsed thereon or attached thereto, duly executed, with such proof or guaranty of the authenticity of the signature as the Corporation or its agents may reasonably require. A record shall be made of each transfer. Whenever any transfer of shares shall be made for collateral security, and not absolutely, it shall be so expressed in the entry of the transfer if, when the certificates are presented, both the transferor and transferee request the Corporation to do so. The Board of Directors shall have the power and authority to make such rules and regulations as it may deem necessary or proper concerning the issue, transfer and registration of certificates for shares of stock of the Corporation.

SECTION 6.03. *Closing of Transfer Books.* The stock transfer books of the Corporation may, if deemed appropriate by the Board of Directors, be closed for such length of time not exceeding fifty (50) days as the Board may determine, preceding the date of any meeting of stockholders or the date for the payment of any dividend or the date for the allotment of rights or the date when the issuance, change, conversion or exchange of capital stock shall go into effect, during which time no transfer of stock on the books of the Corporation may be made.

SECTION 6.04. *Fixing the Record Date.* (a) In order that the Corporation may determine the stockholders entitled to notice of or to vote at any meeting of stockholders or any adjournment thereof, the Board of Directors may fix a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted by the Board of Directors, and which record date shall not be more than sixty (60) nor less than ten (10) days before the date of such meeting. If no record date is fixed by the Board of Directors, the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day next preceding the day on which notice is given, or, if notice is waived, at the close of business on the day next preceding the day on which the meeting is held. A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting, *provided* that the Board of Directors may fix a new record date for the adjourned meeting.

(b) In order that the Corporation may determine the stockholders entitled to consent to corporate action in writing without a meeting, the Board of Directors may fix a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted by the Board of Directors, and which date shall not be more than ten (10) days after the date upon which the resolution fixing the record date is adopted by the Board of Directors. If no record date has been fixed by the Board of Directors, the record date for determining stockholders entitled to consent to corporate action in writing without a meeting, when no prior action by the Board of Directors is required by Delaware Law, shall be the first date on which a signed written consent setting forth the action taken or proposed to be taken is delivered to the Corporation by delivery to its registered office in Delaware, its principal place of business, or an officer or agent of the Corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to the Corporation's registered office shall be by hand or by certified or registered mail, return receipt requested. If no record date has been fixed by the Board of Directors and prior action by the Board of Directors is required by Delaware Law, the record date for determining stockholders entitled to consent to corporate action in writing without a meeting shall be at the close of business on the day on which the Board of Directors adopts the resolution taking such prior action.

(c) In order that the Corporation may determine the stockholders entitled to receive payment of any dividend or other distribution or allotment of any rights or the stockholders entitled to exercise any rights in respect of any change, conversion or exchange of stock, or for the purpose of any other lawful action, the Board of Directors may fix a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted, and which record date shall be not more than sixty (60) days prior to such action. If no record date is fixed, the record date for determining stockholders for any such purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating thereto.

SECTION 6.05. *Lost or Destroyed Certificates.* A new certificate of stock may be issued in the place of any certificate previously issued by the Corporation, alleged to have been lost, stolen, destroyed or mutilated, and the Board of Directors may, in its discretion, require the owner of such lost, stolen, destroyed or mutilated certificate, or his or her legal representative, to give the Corporation a bond, in such sum as the Board of Directors may direct, in order to indemnify the Corporation against any claims that may be made against it in connection therewith.

ARTICLE 7

INDEMNIFICATION

SECTION 7.01 *Indemnification.* (a) A director of the Corporation shall not be liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director to the fullest extent permitted by Delaware Law. The foregoing shall not eliminate or limit any liability that may exist with respect to (i) a breach of the director's duty of loyalty to the Corporation or its stockholders, (ii) acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) liability under Section 174 of Delaware Law, or (iv) a transaction from which the director derived an improper personal benefit.

(b) (1) Each person (and the heirs, executors or administrators of such person) who was or is a party or is threatened to be made a party to, or is involved in any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that such person is or was a director or officer of the Corporation or is or was serving at the request of the Corporation as a director or officer of another corporation, partnership, joint venture, trust or other enterprise, shall be indemnified and held harmless by the Corporation to the fullest extent permitted by Delaware Law. The right to indemnification conferred in this Article 7 shall also include the right to be paid by the Corporation the expenses incurred in connection with any such proceeding in advance of its final disposition to the fullest extent authorized by Delaware Law. The right to indemnification conferred in this Article 7 shall be a contract right.

(2) The Corporation may, by action of its Board of Directors, provide indemnification to such of the employees and agents of the Corporation to such extent and to such effect as the Board of Directors shall determine to be appropriate and authorized by Delaware Law.

(c) The Corporation shall have power to purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the Corporation, or is or was serving at the request of the Corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any expense, liability or loss incurred by such person in any such capacity or arising out of his status as such, whether or not the Corporation would have the power to indemnify him against such liability under Delaware Law.

(d) The rights and authority conferred in this Article 7 shall not be exclusive of any other right which any person may otherwise have or hereafter acquire.

(e) Neither the amendment nor repeal of this Article 7 nor the adoption of any provision of these By-Laws or the Certificate of Incorporation of the Corporation, nor, to the fullest extent permitted by Delaware Law, any modification of law, shall eliminate or reduce the effect of this Article 7 in respect of any acts or omissions occurring prior to such amendment, repeal, adoption or modification.

ARTICLE 8

GENERAL PROVISIONS

SECTION 8.01. *Dividends.* Subject to limitations contained in Delaware Law and the Certificate of Incorporation, the Board of Directors may declare and pay dividends upon the shares of capital stock of the Corporation, which dividends may be paid either in cash, in property or in shares of the capital stock of the Corporation.

SECTION 8.02. *Year.* The fiscal year of the Corporation shall commence on January 1 and end on December 31 of each year.

SECTION 8.03. *Corporate Seal.* The corporate seal shall have inscribed thereon the name of the Corporation, the year of its organization and the words "Corporate Seal, Delaware". The seal may be used by causing it or a facsimile thereof to be impressed, affixed or otherwise reproduced.

SECTION 8.04. *Voting of Stock Owned by the Corporation.* The Board of Directors may authorize any person, on behalf of the Corporation, to attend, vote at and grant proxies to be used at any meeting of stockholders of any Corporation (except this Corporation) in which the Corporation may hold stock.

SECTION 8.05. *Amendments.* These bylaws or any of them, may be altered, amended or repealed, or new bylaws may be made, by the stockholders entitled to vote thereon at any annual or special meeting thereof or by the Board of Directors.

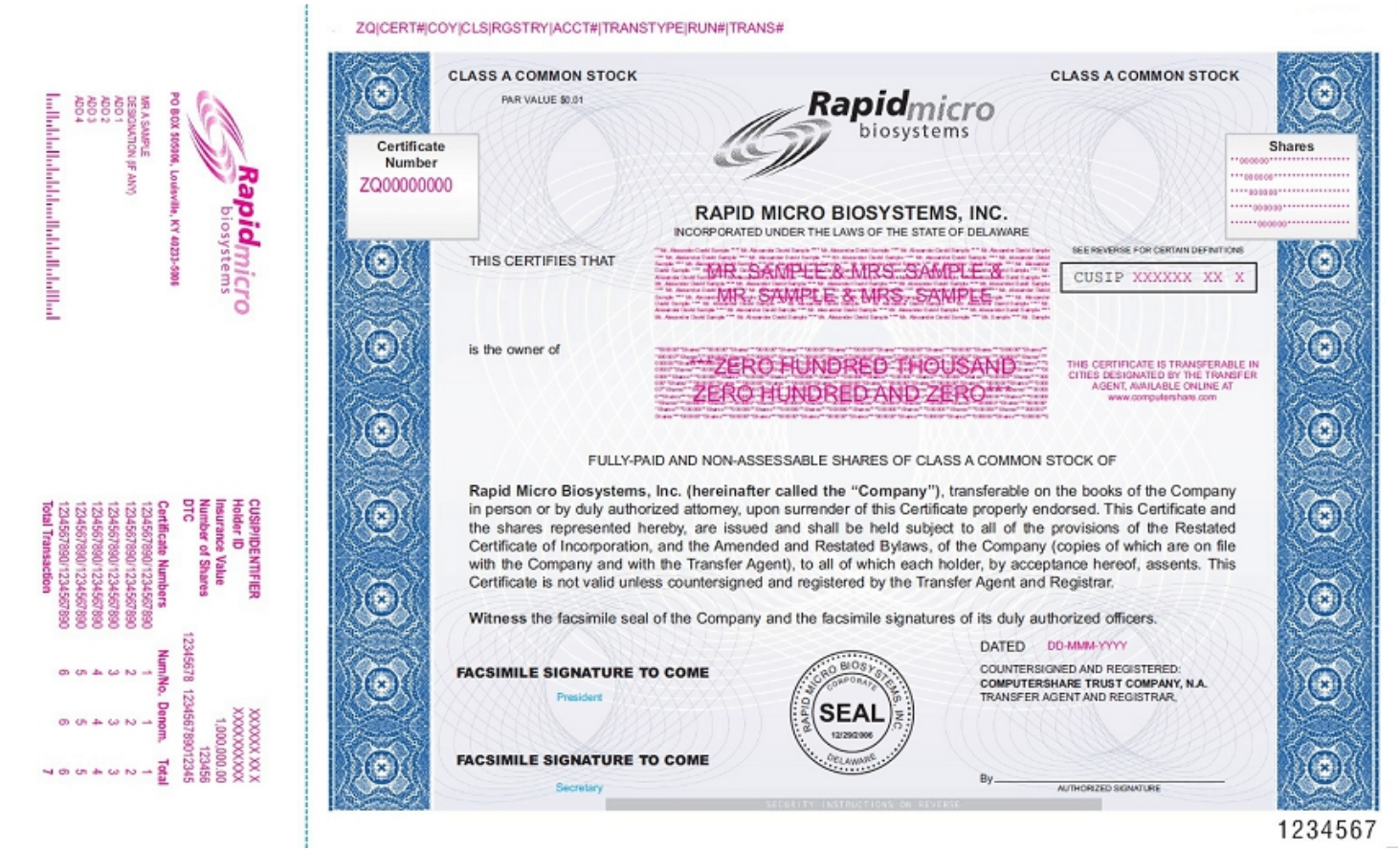
SECTION 8.06 *Notice.* (a) Whenever notice is required to be given by law, the Certificate of Incorporation or these bylaws, such notice may be mailed or given by a form of electronic transmission consented to by the person to whom the notice is given. Any such consent shall be revocable by such person by written notice to the Corporation. Any such consent shall be deemed revoked if (a) the Corporation is unable to deliver by electronic transmission two consecutive notices in accordance with such consent and (b) such inability becomes known to the secretary or an assistant secretary of the Corporation or to the transfer agent or other person responsible for the giving of notice; *provided, however,* the inadvertent failure to treat such inability as a revocation shall not invalidate any meeting or other action.

(b) Notice given pursuant to these bylaws shall be deemed given: (i) if mailed, when deposited in the United States mail, postage pre-paid, addressed to the person entitled to such notice at his or her address as it appears on the books and records of the Corporation, (ii) if by facsimile telecommunication, when directed to a number at which such person has consented to receive notice; (iii) if by electronic mail, when directed to an electronic mail address at which such person has consented to receive notice; (iv) if by a posting on an electronic network together with separate notice to such person of such specific posting, upon the later of (A) such posting and (B) the giving of such separate notice; and (v) if by any other form of electronic transmission, when directed to such person. An affidavit of the Secretary or an Assistant Secretary or of the transfer agent or other agent of the Corporation that the notice has been given by a form of electronic transmission shall, in the absence of fraud, be prima facie evidence of the facts stated herein.

(c) For purposes of these bylaws, "electronic transmission" means any form of communication, not directly involving the physical transmission of paper, that creates a record that may be retained, retrieved, and reviewed by a recipient thereof, and that may be directly reproduced in paper form by such a recipient through an automated process.

SECTION 8.07. *Waiver of Notice.* Whenever notice is required to be given by law, the Certificate of Incorporation or these bylaws, a waiver thereof submitted by electronic transmission or in writing signed by the person entitled to notice, whether before or after the time stated therein, shall be deemed equivalent to notice. Attendance of an individual at a meeting, in person, by written proxy, or by means of remote communication, shall constitute a waiver of notice of such meeting, except when the person attends a meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened, and the execution by a person of a consent in writing or by electronic transmission in lieu of meeting shall constitute a waiver of notice of the action taken by such consent. Neither the business to be transacted at, nor the purpose of, any meeting of the stockholders, directors, or members of a committee of the Board of Directors need be specified in any such waiver or notice.

Exhibit 4.1



ZQ|CERT#|COY|CLS|RGSTRY|ACCT#|TRANSTYPE|RUN#|TRANS#

CLASS A COMMON STOCK

PAR VALUE $0.01

CLASS A COMMON STOCK

Rapidmicro biosystems

Certificate Number

ZQ00000000

Shares

RAPID MICRO BIOSYSTEMS, INC.

INCORPORATED UNDER THE LAWS OF THE STATE OF DELAWARE

THIS CERTIFIES THAT

MR. SAMPLE & MRS. SAMPLE & MR. SAMPLE & MRS. SAMPLE

SEE REVERSE FOR CERTAIN DEFINITIONS

CUSIP XXXXXX XX X

is the owner of

ZERO HUNDRED THOUSAND ZERO HUNDRED AND ZERO

THIS CERTIFICATE IS TRANSFERABLE IN CITIES DESIGNATED BY THE TRANSFER AGENT, AVAILABLE ONLINE AT www.computershare.com

FULLY-PAID AND NON-ASSESSABLE SHARES OF CLASS A COMMON STOCK OF

Rapid Micro Biosystems, Inc. (hereinafter called the "Company"), transferable on the books of the Company in person or by duly authorized attorney, upon surrender of this Certificate properly endorsed. This Certificate and the shares represented hereby, are issued and shall be held subject to all of the provisions of the Restated Certificate of Incorporation, and the Amended and Restated Bylaws, of the Company (copies of which are on file with the Company and with the Transfer Agent), to all of which each holder, by acceptance hereof, assents. This Certificate is not valid unless countersigned and registered by the Transfer Agent and Registrar.

Witness the facsimile seal of the Company and the facsimile signatures of its duly authorized officers.

DATED DD-MMM-YYYY

FACSIMILE SIGNATURE TO COME

President

RAPID MICRO BIOSYSTEMS, INC. CORPORATE SEAL 12/29/2006 DELAWARE

COUNTERSIGNED AND REGISTERED:
COMPUTERSHARE TRUST COMPANY, N.A.
TRANSFER AGENT AND REGISTRAR,

FACSIMILE SIGNATURE TO COME

Secretary

By _____
AUTHORIZED SIGNATURE

SECURITY INSTRUCTIONS ON REVERSE

1234567

Rapidmicro biosystems

PO BOX 55555, Louisville, KY 40233-5555

MR A SAMPLE
DESIGNATION (IF ANY)
ADD 1
ADD 2
ADD 3
ADD 4

CUSIP/IDENTIFIER	XXXXXX XX X
Holder ID	XXXXXXXXXX
Insurance Value	1,000,000.00
Number of Shares	123456
DTC	12345678 12345678912345

Certificate Numbers	Num/No.	Denom.	Total
12345678901234567890	1	1	1
12345678901234567890	2	2	2
12345678901234567890	3	3	3
12345678901234567890	4	4	4
12345678901234567890	5	5	5
12345678901234567890	6	6	6
Total Transaction			7

RAPID MICRO BIOSYSTEMS, INC.

THE COMPANY WILL FURNISH WITHOUT CHARGE TO EACH SHAREHOLDER WHO SO REQUESTS, A SUMMARY OF THE POWERS, DESIGNATIONS, PREFERENCES AND RELATIVE, PARTICIPATING, OPTIONAL OR OTHER SPECIAL RIGHTS OF EACH CLASS OF STOCK OF THE COMPANY AND THE QUALIFICATIONS, LIMITATIONS OR RESTRICTIONS OF SUCH PREFERENCES AND RIGHTS, AND THE VARIATIONS IN RIGHTS, PREFERENCES AND LIMITATIONS DETERMINED FOR EACH SERIES, WHICH ARE FIXED BY THE ARTICLES OF INCORPORATION OF THE COMPANY, AS AMENDED, AND THE RESOLUTIONS OF THE BOARD OF DIRECTORS OF THE COMPANY, AND THE AUTHORITY OF THE BOARD OF DIRECTORS TO DETERMINE VARIATIONS FOR FUTURE SERIES. SUCH REQUEST MAY BE MADE TO THE OFFICE OF THE SECRETARY OF THE COMPANY OR TO THE TRANSFER AGENT. THE BOARD OF DIRECTORS MAY REQUIRE THE OWNER OF A LOST OR DESTROYED STOCK CERTIFICATE, OR HIS LEGAL REPRESENTATIVES, TO GIVE THE COMPANY A BOND TO INDEMNIFY IT AND ITS TRANSFER AGENTS AND REGISTRARS AGAINST ANY CLAIM THAT MAY BE MADE AGAINST THEM ON ACCOUNT OF THE ALLEGED LOSS OR DESTRUCTION OF ANY SUCH CERTIFICATE.

The following abbreviations, when used in the inscription on the face of this certificate, shall be construed as though they were written out in full according to applicable laws or regulations:

TEN COM - as tenants in common	UNIF GIFT MIN ACT -	(Cust) Custodian (Minor)
TEN ENT - as tenants by the entireties		under Uniform Gifts to Minors Act (State)
JT TEN - as joint tenants with right of survivorship and not as tenants in common	UNIF TRF MIN ACT -	(Cust) Custodian (until age) (Minor) under Uniform Transfers to Minors Act (State)

Additional abbreviations may also be used though not in the above list.

PLEASE INSERT SOCIAL SECURITY OR OTHER IDENTIFYING NUMBER OF ASSIGNEE

For value received, _____ hereby sell, assign and transfer unto

_____

(PLEASE PRINT OR TYPEWRITE NAME AND ADDRESS, INCLUDING POSTAL ZIP CODE, OF ASSIGNEE)

_____

_____

_____ Shares

of the Class A Common Stock represented by the within Certificate, and do hereby irrevocably constitute and appoint

_____ Attorney

to transfer the said stock on the books of the within-named Company with full power of substitution in the premises.

Dated: _____ 20____

Signature: _____

Signature: _____

Notice: The signature to this assignment must correspond with the name as written upon the face of the certificate, in every particular, without alteration or enlargement, or any change whatever.

Signature(s) Guaranteed: Medallion Guarantee Stamp

THE SIGNATURE(S) SHOULD BE GUARANTEED BY AN ELIGIBLE GUARANTOR INSTITUTION (Banks, Stockbrokers, Savings and Loan Associations and Credit Unions) WITH MEMBERSHIP IN AN APPROVED SIGNATURE GUARANTEE MEDALLION PROGRAM, PURSUANT TO S.E.C. RULE 17Ad-15.

SECURITY INSTRUCTIONS

THIS IS WATERMARKED PAPER. DO NOT ACCEPT WITHOUT NOTING WATERMARK. HOLD TO LIGHT TO VERIFY WATERMARK.

The IRS requires that the named transfer agent ("we") report the cost basis of certain shares or units acquired after January 1, 2011. If your shares or units are covered by the legislation, and you requested to sell or transfer the shares or units using a specific cost basis calculation method, then we have processed as you requested. If you did not specify a cost basis calculation method, then we have defaulted to the first in, first out (FIFO) method. Please consult your tax advisor if you need additional information about cost basis.

If you do not keep in contact with the issuer or do not have any activity in your account for the time period specified by state law, your property may become subject to state unclaimed property laws and transferred to the appropriate state.

154257

Schedule of Holders of Warrants
to Purchase Common Stock

Holder Name

KPCB Holdings, Inc.
Longitude Venture Partners II, L.P.
Quaker BioVentures II, L.P.
TPG RAMB Holdings, L.P.

THIS WARRANT AND THE SECURITIES ISSUABLE UPON THE EXERCISE HEREOF HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. THEY MAY NOT BE SOLD, OFFERED FOR SALE, PLEDGED, HYPOTHECATED, OR OTHERWISE TRANSFERRED EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY THAT REGISTRATION IS NOT REQUIRED UNDER SUCH ACT OR UNLESS SOLD PURSUANT TO RULE 144 UNDER SUCH ACT.

Date of Issuance: March 22, 2015

Void after March 9, 2022,
unless earlier terminated
pursuant to the terms hereof

RAPID MICRO BIOSYSTEMS, INC.
WARRANT TO PURCHASE SHARES OF PREFERRED STOCK

For the Purchase Price of Warrant stipulated in that certain Note and Warrant Purchase Agreement, dated as of March 9, 2015, among the Company, Lender and certain other investors, as the same may be amended, restated or otherwise modified from time to time (the "Purchase Agreement") the receipt and sufficiency of which is hereby acknowledged, this Warrant is issued to _____ or its assigns (the "Holder") by **Rapid Micro Biosystems, Inc.**, a Delaware corporation (the "Company"). Capitalized terms not defined herein shall have the meaning set forth in the Purchase Agreement.

1. Purchase of Shares.

(a) Number of Conversion Shares. Subject to the terms and conditions set forth herein and set forth in the Purchase Agreement, and provided that the Holder has invested at least its Pro Rata Portion of both (i) the Aggregate Note Financing Amount in principal of Notes to be issued pursuant to the Purchase Agreement, and (ii) the Aggregate Next Equity Financing Amount for the purchase of shares of Equity Securities in the Next Equity Financing, the Holder is entitled, upon surrender of this Warrant at the principal office of the Company (or at such other place as the Company shall notify the Holder in writing), to purchase from the Company up to the number of fully paid and nonassessable Conversion Shares as described in Section 3 of the Purchase Agreement (as adjusted pursuant to Section 6 hereof).

(b) Exercise Price. The purchase price for the Conversion Shares issuable pursuant to this Section 1 shall be the exercise price described in Section 3 of the Purchase Agreement. The Conversion Shares and the purchase price of such Conversion Shares shall be subject to adjustment pursuant to Section 6 hereof. Such purchase price, as adjusted from time to time, is herein referred to as the "Exercise Price."

2. Exercise Period; Termination. Provided that the Holder has satisfied the conditions specified in Sections 1(a)(i) and 1(a)(ii) hereof, and unless earlier terminated pursuant to the terms hereof, this Warrant shall be exercisable, in whole or in part, during the period commencing on the closing date of the Company's Next Equity Financing and ending at 5:00 p.m. pacific time on March 9, 2022 (the "Exercise Period"). Notwithstanding the foregoing, this Warrant shall terminate in full and be of no further force or effect at the earliest to occur of (i) 5:00 p.m. pacific time on the Second Anniversary Date if the Next Equity Financing has not been consummated by such time, (ii) upon the closing of the Next Equity Financing if consummated on or before the Second Anniversary Date, and each Lender, including the Holder, has invested at least its Pro Rata Portion of both (A) the Aggregate Note Financing Amount in principal of Notes to be issued pursuant to the Purchase Agreement, and (B) the Aggregate Next Equity Financing Amount for the purchase of shares of Equity Securities in the Next Equity Financing, (iii) upon the closing of the Next Equity Financing if consummated on or before the Second Anniversary Date, and the Holder has not invested at least its Pro Rata Portion of the Aggregate Next Equity Financing Amount for the purchase of shares of Equity Securities in the Next Equity Financing, or (iv) upon the consummation of Corporate Transaction. In the event that this Warrant has not been otherwise terminated pursuant to this Section 2, upon the expiration of the Exercise Period or immediately prior to the consummation of a Corporate Transaction (whichever is earlier), the fair market value of one Conversion Share (or other security issuable upon the exercise hereof) as determined in accordance with Section 4 below is greater than the Exercise Price in effect on such date, then this Warrant, to the extent then exercisable, shall automatically be deemed on and as of such date to be exercised pursuant to Section 4 below as to all Conversion Shares (or such other securities) for which it shall not have been previously exercised, and the Company shall, within a reasonable time, deliver a certificate representing the Conversion Shares (or such other securities) issued upon such exercise to Holder.

3. Method of Exercise.

(a) While this Warrant remains outstanding and exercisable in accordance with Section 2 above, the Holder may exercise, in whole or in part, the purchase rights evidenced hereby. Such exercise shall be effected by:

(i) the surrender of the Warrant, together with a duly executed copy of the Notice of Exercise attached hereto, to the Secretary of the Company at its principal office (or at such other place as the Company shall notify the Holder in writing); and

(ii) the payment to the Company of an amount equal to the aggregate Exercise Price for the number of Conversion Shares being purchased.

(b) Each exercise of this Warrant shall be deemed to have been effected immediately prior to the close of business on the day on which this Warrant is surrendered to the Company as provided in Section 3(a) above. At such time, the person or persons in whose name or names any certificate for the Conversion Shares shall be issuable upon such exercise as provided in Section 3(c) below shall be deemed to have become the holder or holders of record of the Conversion Shares represented by such certificate.

(c) As soon as practicable after the exercise of this Warrant in whole or in part, and in any event within twenty (20) days thereafter, the Company at its expense will cause to be issued in the name of, and delivered to, the Holder, or as such Holder (upon payment by such Holder of any applicable transfer taxes) may direct:

(i) a certificate or certificates for the number of Conversion Shares to which such Holder shall be entitled, and

(ii) in case such exercise is in part only, a new warrant or warrants (dated the date hereof) of like tenor, calling in the aggregate on the face or faces thereof for the number of Conversion Shares equal to the number of such Conversion Shares called for on the face of this Warrant minus the number of Conversion Shares purchased by the Holder upon all exercises made in accordance with Section 3(a) above or Section 4 below.

4. Net Exercise. In lieu of exercising this Warrant for cash, the Holder may elect to receive shares equal to the value of this Warrant (or the portion thereof being exercised) by surrender of this Warrant at the principal office of the Company together with notice of such election (a "Net Exercise"). A Holder who Net Exercises shall have the rights described in Sections 3(b) and 3(c) hereof, and the Company shall issue to such Holder a number of Conversion Shares computed using the following formula:

$$X = \frac{Y(A-B)}{A}$$

Where

X = The number of Conversion Shares to be issued to the Holder.

Y = The number of Conversion Shares purchasable under this Warrant or, if only a portion of the Warrant is being exercised, the portion of the Warrant being cancelled (at the date of such calculation).

A = The fair market value of one (1) Conversion Share (at the date of such calculation).
B = The Exercise Price (as adjusted to the date of such calculations).

For purposes of this Section 4, the fair market value of a Conversion Share shall mean the average of the closing price of the Conversion Shares (or equivalent shares of Common Stock underlying the Conversion Shares) quoted in the over-the-counter market in which the Conversion Shares (or equivalent shares of Common Stock underlying the Conversion Shares) are traded or the closing price quoted on any exchange or electronic securities market on which the Conversion Shares (or equivalent shares of Common Stock underlying the Warrants) are listed, whichever is applicable, as published in *The Wall Street Journal* for the five (5) trading days prior to the date of determination of fair market value (or such shorter period of time during which such Conversion Shares were traded over-the-counter or on such exchange). In the event that this Warrant is exercised pursuant to this Section 4 in connection with the Company's Initial Public Offering, the fair market value per Conversion Share shall be the product of (a) the per share offering price to the public of the Company's Initial Public Offering, and (b) the number of shares of Common Stock into which each Conversion Share is convertible at the time of such exercise or, if the Conversion Shares are shares of Common Stock, one. In the event that this Warrant is exercised pursuant to this Section 4 in connection with a Corporate Transaction (whether automatically in accordance with Section 2 above or upon notice by the Holder), the fair market value per Conversion Share shall be the per share price paid to a holder of Equity Securities issued in the Next Equity Financing. In the event that this Warrant is exercised not in connection with the Initial Public Offering or Corporate Transaction and the Conversion Shares are not traded on the over-the-counter market, an exchange or an electronic securities market, the fair market value shall be the price per Conversion Share that the Company could obtain from a willing buyer for Conversion Shares sold by the Company from authorized but unissued Conversion Shares, as such prices shall be determined in reasonable good faith by the Company's Board of Directors.

5. Covenants of the Company.

(a) Notices of Record Date. In the event of any taking by the Company of a record of the holders of any class of securities for the purpose of determining the holders thereof who are entitled to receive any dividend (other than a cash dividend which is the same as cash dividends paid in previous quarters or a stock dividend) or other distribution, the Company shall mail to the Holder, at least ten (10) days prior to such record date, a notice specifying the date on which any such record is to be taken for the purpose of such dividend or distribution.

(b) Covenants as to Exercise Shares. The Company covenants and agrees that all Conversion Shares that may be issued upon the exercise of the rights represented by this Warrant will, upon issuance in accordance with the terms hereof, be validly issued and outstanding, fully paid and nonassessable, and free from all taxes, liens and charges with respect to the issuance thereof. The Company further covenants and agrees that the Company will at all times during the Exercise Period have authorized and reserved, free from preemptive rights, a sufficient number of shares of its Preferred Stock to provide for the exercise of the rights represented by this Warrant. If at any time during the Exercise Period the number of authorized but unissued shares of Preferred Stock shall not be sufficient to permit exercise of this Warrant, the Company will take such corporate action as may, in the opinion of its counsel, be necessary to increase its authorized but unissued shares of Preferred Stock to such number of shares as shall be sufficient for such purposes.

6. Adjustment of Exercise Price and Number of Conversion Shares. The number and kind of Conversion Shares purchasable upon exercise of this Warrant and the Exercise Price shall be subject to adjustment from time to time as follows:

(a) Subdivisions, Combinations and Other Issuances. If the Company shall at any time after the issuance but prior to the expiration of this Warrant subdivide its Preferred Stock, by split-up or otherwise, or combine its Preferred Stock, or issue additional shares of its Preferred Stock or Common Stock as a dividend with respect to any shares of its Preferred Stock, the number of Conversion Shares issuable on the exercise of this Warrant shall forthwith be proportionately increased in the case of a subdivision or stock dividend, or proportionately decreased in the case of a combination. Appropriate adjustments shall also be made to the Exercise Price payable per share, but the aggregate Exercise Price payable for the total number of Conversion Shares purchasable under this Warrant (as adjusted) shall remain the same. Any adjustment under this Section 6(a) shall become effective at the close of business on the date the subdivision or combination becomes effective, or as of the record date of such dividend, or in the event that no record date is fixed, upon the making of such dividend.

(b) Reclassification, Reorganization and Consolidation. In case of any reclassification, capital reorganization or change in the capital stock of the Company (other than as a result of a subdivision, combination or stock dividend provided for in Section 6(a) above), then, as a condition of such reclassification, reorganization or change, lawful provision shall be made, and duly executed documents evidencing the same from the Company or its successor shall be delivered to the Holder, so that the Holder shall have the right at any time prior to the expiration of this Warrant to purchase, at a total price equal to that payable upon the exercise of this Warrant, the kind and amount of shares of stock and other securities or property receivable in connection with such reclassification, reorganization or change by a holder of the same number and type of securities as were purchasable as Conversion Shares by the Holder immediately prior to such reclassification, reorganization or change. In any such case appropriate provisions shall be made with respect to the rights and interest of the Holder so that the provisions hereof shall thereafter be applicable with respect to any shares of stock or other securities or property deliverable upon exercise hereof, and appropriate adjustments shall be made to the Exercise Price per Conversion Share payable hereunder, provided the aggregate Exercise Price shall remain the same.

(c) Adjustments for Diluting Issuances. Without duplication of any adjustment otherwise provided for in this Section 6, the number of shares of common stock issuable upon conversion of the Conversion Shares shall be subject to anti-dilution adjustment from time to time in the manner set forth in the Company's Certificate of Incorporation as if the Conversion Shares were issued and outstanding on and as of the date of any such required adjustment.

(d) Notice of Adjustment. When any adjustment is required to be made in the number or kind of shares purchasable upon exercise of the Warrant, or in the Exercise Price, the Company shall promptly notify the Holder of such event and of the number of Conversion Shares or other securities or property thereafter purchasable upon exercise of this Warrant.

(e) Conversion of Preferred Stock. In the event that all outstanding shares of Preferred Stock are converted to Common Stock, or any other security, in accordance with the terms of the Restated Certificate in connection with the Initial Public Offering, a Corporate Transaction or other event, this Warrant shall become exercisable for Common Stock or such other security.

7. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant, but in lieu of such fractional shares the Company shall make a cash payment therefor on the basis of the Exercise Price then in effect.

8. No Stockholder Rights. Other than in respect of the adjustments provided in Section 6 hereof, prior to exercise of this Warrant, the Holder shall not be entitled to any rights of a stockholder with respect to the Conversion Shares, including (without limitation) the right to vote such Conversion Shares, receive dividends or other distributions thereon, exercise preemptive rights or be notified of stockholder meetings, and except as otherwise provided in this Warrant or the Purchase Agreement, such Holder shall not be entitled to any stockholder notice or other communication concerning the business or affairs of the Company.

9. Notice of Certain Events. If the Company proposes at any time to:

(a) declare any dividend or distribution upon the outstanding shares of the Company's capital stock, whether in cash, property, stock, or other securities and whether or not a regular cash dividend;

(b) effect any reclassification, exchange, combination, substitution, reorganization or recapitalization of the outstanding shares of the Company's capital stock;

(c) effect a Corporate Transaction or to liquidate, dissolve or wind up; or

(d) effect an Initial Public Offering;

then, in connection with each such event, the Company shall give Holder:

(i) at least seven (7) Business Days prior written notice of the date on which a record will be taken for such dividend, distribution, or subscription rights (and specifying the date on which the holders of outstanding shares of the Company's capital stock will be entitled thereto) or for determining rights to vote, if any, in respect of the matters referred to in (a) above;

(ii) in the case of the matters referred to in (b) and (c) above at least seven (7) business days prior written notice of the date when the same will take place (and specifying the date on which the holders of outstanding shares of the Company's capital stock will be entitled to exchange their shares for the securities or other property deliverable upon the occurrence of such event and such reasonable information as Holder may reasonably require regarding the treatment of this Warrant in connection with such event giving rise to the notice); and

(iii) with respect to the Initial Public Offering, at least seven (7) business days prior written notice of the date on which the Company proposes to file its registration statement in connection therewith.

Company will also provide information requested by Holder that is reasonably necessary to enable Holder to comply with Holder's accounting or reporting requirements.

10. Transfer of Warrant. Subject to compliance with applicable federal and state securities laws and any other contractual restrictions between the Company and the Holder contained in the Purchase Agreement, this Warrant and all rights hereunder are transferable in whole or in part by the Holder to any person or entity upon written notice to the Company. Within a reasonable time after the Company's receipt of an executed Assignment Form in the form attached hereto, the transfer shall be recorded on the books of the Company upon the surrender of this Warrant, properly endorsed, to the Company at its principal offices, and the payment to the Company of all transfer taxes and other governmental charges imposed on such transfer. In the event of a partial transfer, the Company shall issue to the new holders one or more appropriate new warrants.

11. Governing Law. This Warrant and any controversy arising out of or relating to this Warrant shall be governed by, and construed in accordance with, the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters (including contract law, tort law and matters of fraud) shall be governed by, and construed in accordance with, the internal laws of the State of California, without regard to conflict of law principles that would result in the application of any law other than the law of the State of California.

12. Successors and Assigns. The terms and provisions of this Warrant and the Purchase Agreement shall inure to the benefit of, and be binding upon, the Company and the holders hereof and their respective successors and assigns.

13. Titles and Subtitles. The titles and subtitles used in this Warrant are used for convenience only and are not to be considered in construing or interpreting this Warrant.

14. Notices. All notices and other communications given or made pursuant hereto shall be in writing and shall be deemed effectively given: (a) upon personal delivery to the party to be notified, (b) when sent by confirmed electronic mail or facsimile if sent during normal business hours of the recipient, and if not so confirmed, then on the next business day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) day after deposit with a nationally recognized overnight courier, specifying next day delivery, with written verification of receipt. All communications shall be sent to the respective parties at the following addresses (or at such other addresses as shall be specified by notice given in accordance with this Section 14):

If to the Company:

RAPID MICRO BIOSYSTEMS, INC.

1001 Pawtucket Blvd.

Lowell, MA 01854

Attention: Chief Executive Officer

If to Holders:

At the addresses shown on the signature pages hereto.

15. Amendments and Waivers; Resolutions of Dispute; Notice. The amendment or waiver of any term of this Warrant, the resolution of any controversy or claim arising out of or relating to this Warrant and the provision of notice shall be conducted pursuant to the terms of the Purchase Agreement.

16. Severability. If any provision of this Warrant is held to be unenforceable under applicable law, such provision shall be excluded from this Warrant and the balance of the Warrant shall be interpreted as if such provision were so excluded and shall be enforceable in accordance with its terms.

[Signature Page Follows]

IN WITNESS WHEREOF, the parties have executed this Warrant as of the date first written above.

RAPID MICRO BIOSYSTEMS, INC.

By: _____
President and Chief Executive Officer

[Signature Page to Warrant]

NOTICE OF EXERCISE

RAPID MICRO BIOSYSTEMS, INC.

Attention: Corporate Secretary

The undersigned hereby elects to purchase, pursuant to the provisions of the Warrant, as follows:

☐ _____Conversion Shares pursuant to the terms of the attached Warrant, and tenders herewith payment in cash of the Exercise Price of such Conversion Shares in full, together with all applicable transfer taxes, if any.

☐ Net Exercise the attached Warrant with respect to_____Conversion Shares.

The undersigned hereby represents and warrants that Representations and Warranties in Section 6 of the Purchase Agreement are true and correct as of the date hereof.

HOLDER:

Date: _____ By: _____

Address: _____

_____

Name in which shares should be registered:

_____

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: _____
(Please Print)

Address: _____
(Please Print)

Dated: _____

Holder's
Signature: _____

Holder's
Address: _____

NOTE: The signature to this Assignment Form must correspond with the name as it appears on the face of the Warrant. Officers of corporations and those acting in a fiduciary or other representative capacity should provide proper evidence of authority to assign the foregoing Warrant.

Schedule of Holders of Warrants
to Purchase Common Stock

Name	Date of Issuance		Conversion Shares Numerator
Andrew Khouri	March 4, 2016	$	450.00
Biomedical Sciences Investment Fund Pte Ltd	March 4, 2016	$	109,173.20
Fletcher Spaght Ventures II, L.P.	March 4, 2016	$	316.87
Foster & Foster Capital V LLC	March 4, 2016	$	32,751.96
Foundation Investments of Ohio Ltd.	March 4, 2016	$	21,834.62
FSV II, L.P.	March 4, 2016	$	31.88
FSV II-B, L.P.	March 4, 2016	$	150.89
Hepalink USA Inc.	March 4, 2016	$	109,173.20
KPCB Holdings, Inc.	March 4, 2016	$	163,822.95
Longitude Venture Partners II, L.P.	March 4, 2016	$	284,614.07
Manbro P.E. IV, LP	March 4, 2016	$	54,586.58
Mellon Family Investment Company V	March 4, 2016	$	32,751.96
MSF Private Equity Fund LLC	March 4, 2016	$	32,751.96
Philip Stewart	March 4, 2016	$	2,183.44
Quaker Bioventures II, L.P.	March 4, 2016	$	258,758.44
Richard King Mellon Foundation	March 4, 2016	$	32,751.96
Robert Spignesi	March 4, 2016	$	1,310.07
Steve Furlong	March 4, 2016	$	760.85
TPG RAMB Holdings, L.P.	March 4, 2016	$	213,460.56
TVM Life Science Ventures VI GmbH & Co. K.G.	May 13, 2016	$	110,492.69
TVM Life Science Ventures VI, L.P.	May 13, 2016	$	37,871.77

THIS WARRANT AND THE SECURITIES ISSUABLE UPON THE EXERCISE HEREOF HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. THEY MAY NOT BE SOLD, OFFERED FOR SALE, PLEDGED, HYPOTHECATED, OR OTHERWISE TRANSFERRED EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY THAT REGISTRATION IS NOT REQUIRED UNDER SUCH ACT OR UNLESS SOLD PURSUANT TO RULE 144 UNDER SUCH ACT.

Date of Issuance: _____ __, 2016 Void after March 4, 2026 unless earlier terminated pursuant to the terms hereof.

RAPID MICRO BIOSYSTEMS, INC.
WARRANT TO PURCHASE SHARES OF PREFERRED STOCK

This Warrant is issued to _____ or [his][her][its] assigns (the "**Holder**") by Rapid Micro Biosystems, Inc., a Delaware corporation (the "**Company**"). Unless otherwise defined herein, capitalized terms shall have the following meanings:

"**Conversion Shares**" shall mean (a) shares of such series of Preferred Stock as are issued in the Next Equity Financing if the Next Equity Financing is consummated on or prior to February 28, 2017; or (b) shares of Series C Preferred Stock if the Next Equity Financing has not been consummated on or prior to February 28, 2017.

"**Corporate Transaction**" shall mean (A) the closing of the sale, transfer or other disposition of all or substantially all of the Company's assets, (B) the consummation of the merger or consolidation of the Company with or into another entity (except a merger or consolidation in which the holders of capital stock of the Company immediately prior to such merger or consolidation continue to hold at least 50% of the voting power of the capital stock of the Company or the surviving or acquiring entity), or (C) the closing of the transfer (whether by merger, consolidation or otherwise), in one transaction or a series of related transactions, to a person or group of affiliated persons (other than an underwriter of this corporation's securities), of the Company's securities if, after such closing, such person or group of affiliated persons would hold 50% or more of the outstanding voting stock of this corporation (or the surviving or acquiring entity); provided, however, that a transaction shall not constitute a Corporate Transaction if its sole purpose is to change the state of the Company's incorporation or to create a holding company that will be owned in substantially the same proportions by the persons who held the Company's securities immediately prior to such transaction. Notwithstanding the prior sentence, the sale of shares of Preferred Stock in a bona fide financing transaction shall not be deemed a Corporate Transaction.

"**Exercise Price**" shall mean: (a) the Next Round Price if this Warrant is exercisable for shares of Preferred Stock issued in the Next Equity Financing; or (b) $1.19583365 if this Warrant is exercisable for shares of Series C Preferred Stock.

"**Next Equity Financing**" shall mean the next sale (or series of related sales) by the Company of its Preferred Stock following [Original Date of Issuance] [March 4, 2016] from which the Company receives aggregate gross proceeds of not less than $10,000,000 (excluding the aggregate amount of any indebtedness of the Company converted into Preferred Stock in the Next Equity Financing).

"**Next Round Price**" shall mean the price per share of Preferred Stock paid by the investors in the Next Equity Financing (excluding, if applicable, any discounts applied to the purchase price of any Preferred Stock issued in the Next Equity Financing upon conversion or cancellation of indebtedness).

"**Original Date of Issuance**" shall mean _____ __, 2016.

"**Preferred Stock**" shall mean the Company's preferred stock, $0.01 par value

per share.

"**Series C Preferred Stock**" shall mean the Company's Series C Preferred Stock,

$0.01 par value per share.

1. Purchase of Shares; Number of Conversion Shares and Exercise Price. Subject to the terms and conditions set forth herein, the Holder is entitled, upon surrender of this Warrant at the principal office of the Company (or at such other place as the Company shall notify the Holder in writing), to purchase from the Company up to a number of fully paid and nonassessable Conversion Shares equal to $_____ divided by the Exercise Price. The Conversion Shares and the Exercise Price of the Conversion Shares shall be subject to adjustment pursuant to Section 7 hereof.

2. Exercise Period; Termination. Unless earlier terminated pursuant to the terms hereof, this Warrant shall be exercisable, in whole or in part, during the period commencing on the Original Date of Issuance and ending at 5:00 p.m. pacific time on March 4, 2026 (the "**Exercise Period**"). In the event that this Warrant has not been otherwise terminated pursuant to this Section 2, upon the expiration of the Exercise Period, if the fair market value of one Conversion Share (or other security issuable upon the exercise hereof) as determined in accordance with Section 4 below is greater than the Exercise Price in effect on such date, then this Warrant, to the extent then exercisable, shall automatically be deemed on and as of such date to be exercised pursuant to Section 4 below as to all Conversion Shares (or such other securities) for which it shall not have been previously exercised, and the Company shall, within a reasonable time, deliver a certificate representing the Conversion Shares (or such other securities) issued upon such exercise to Holder.

3. Method of Exercise.

(a) While this Warrant remains outstanding and exercisable in accordance with Section 2 above, the Holder may exercise, in whole or in part, the purchase rights evidenced hereby. Such exercise shall be effected by:

(i) the surrender of the Warrant, together with a duly executed copy of the Notice of Exercise attached hereto, to the Secretary of the Company at its principal office (or at such other place as the Company shall notify the Holder in writing); and

(ii) the payment to the Company of an amount equal to the aggregate Exercise Price for the number of Conversion Shares being purchased.

(b) Each exercise of this Warrant shall be deemed to have been effected immediately prior to the close of business on the day on which this Warrant is surrendered to the Company as provided in Section 3(a) above. At such time, the person or persons in whose name or names any certificate for the Conversion Shares shall be issuable upon such exercise as provided in Section 3(c) below shall be deemed to have become the holder or holders of record of the Conversion Shares represented by such certificate.

(c) As soon as practicable after the exercise of this Warrant in whole or in part, and in any event within twenty (20) days thereafter, the Company at its expense will cause to be issued in the name of, and delivered to, the Holder, or as such Holder (upon payment by such Holder of any applicable transfer taxes) may direct:

(i) a certificate or certificates for the number of Conversion Shares to which such Holder shall be entitled, and

(ii) in case such exercise is in part only, a new warrant or warrants (dated the date hereof) of like tenor, calling in the aggregate on the face or faces thereof for the number of Conversion Shares equal to the number of such Conversion Shares called for on the face of this Warrant minus the number of Conversion Shares purchased by the Holder upon all exercises made in accordance with Section 3(a) above or Section 4 below.

4. Net Exercise. In lieu of exercising this Warrant for cash, the Holder may elect to receive shares equal to the value of this Warrant (or the portion thereof being exercised) by surrender of this Warrant at the principal office of the Company together with notice of such election (a "**Net Exercise**"). A Holder who Net Exercises shall have the rights described in Sections 3(b) and 3(c) hereof, and the Company shall issue to such Holder a number of Conversion Shares computed using the following formula:

$$X = \frac{Y(A-B)}{A}$$

Where

X = The number of Conversion Shares to be issued to the Holder.
Y = The number of Conversion Shares purchasable under this Warrant or, if only a portion of the Warrant is being exercised, the portion of the Warrant being cancelled (at the date of such calculation).

A = The fair market value of one (1) Conversion Share (at the date of such calculation).
B = The Exercise Price (as adjusted to the date of such calculations).

For purposes of this Section 4, the fair market value of a Conversion Share shall mean the average of the closing price of the Conversion Shares (or equivalent shares of Common Stock underlying the Conversion Shares) quoted in the over-the-counter market in which the Conversion Shares (or equivalent shares of Common Stock underlying the Conversion Shares) are traded or the closing price quoted on any exchange or electronic securities market on which the Conversion Shares (or equivalent shares of Common Stock underlying the Warrants) are listed, whichever is applicable, as published in *The Wall Street Journal* for the five (5) trading days prior to the date of determination of fair market value (or such shorter period of time during which such Conversion Shares were traded over-the-counter or on such exchange). In the event that this Warrant is exercised pursuant to this Section 4 in connection with the Company's first underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended (the "**IPO**"), the fair market value per Conversion Share shall be the product of (a) the per share offering price to the public of the IPO, and (b) the number of shares of Common Stock into which each Conversion Share is convertible at the time of such exercise or, if the Conversion Shares are shares of Common Stock, one. In the event that this Warrant is exercised not in connection with the IPO and the Conversion Shares are not traded on the over- the-counter market, an exchange or an electronic securities market, the fair market value shall be the price per Conversion Share that the Company could obtain from a willing buyer for Conversion Shares sold by the Company from authorized but unissued Conversion Shares, as such prices shall be determined in reasonable good faith by the Company's Board of Directors.

5. Representations and Warranties of the Company and the Holder.

(a) The Company hereby represents and warrants to the Holder as follows:

(i) The Company is a corporation duly organized, validly existing, and in good standing under the laws of the State of Delaware and has all requisite corporate power and authority to carry on its business as now conducted. The Company is duly qualified to transact business and is in good standing in each jurisdiction in which the failure to so qualify would have a material adverse effect on its business or properties.

(ii) Except for the authorization and issuance of the Conversion Shares issuable in connection with the Next Equity Financing, all corporate action has been taken on the part of the Company, its officers, directors and stockholders necessary for the authorization, execution and delivery of this Warrant. Except as may be limited by applicable bankruptcy, insolvency, reorganization, or similar laws relating to or affecting the enforcement of creditors' rights, the Company has taken all corporate action required to make all of the obligations of the Company reflected in the provisions of this Warrant, the valid and enforceable obligations they purport to be.

(iii) The issuance and delivery of this Warrant will not constitute or result in a material default or violation of any law or regulation applicable to the Company or any material term or provision of the Company's Fourth Amended and Restated Certificate of Incorporation filed with the Secretary of State of the State of Delaware on April 21, 2015 (the "**Restated Certificate**") or the Company's current bylaws or any material agreement or instrument by which it is bound or to which its properties or assets are subject.

(b) The Holder hereby represents and warrants to the Company as follows:

(i) This Warrant, the Conversion Shares issuable upon exercise of this Warrant and any other securities issuable upon conversion of the Conversion Shares (collectively, the "**Securities**"), are being acquired for investment for Holder's own account, not as a nominee or agent, and not with a view to the resale or distribution of any part thereof. Holder has no present intention of selling, granting any participation in, or otherwise distributing the same. Holder does not have any contract, undertaking, agreement or arrangement with any person to sell, transfer or grant participations to such person or to any third person, with respect to the Securities.

(ii) Holder acknowledges that it has received all the information it considers necessary or appropriate for deciding whether to acquire the Securities. Holder further represents that it has had an opportunity to ask questions and receive answers from the Company regarding the terms and conditions of the offering of the Securities.

(iii) Holder is an investor in securities of companies in the development stage and acknowledges that it is able to fend for itself, can bear the economic risk of its investment and has such knowledge and experience in financial or business matters that it is capable of evaluating the merits and risks of the investment in the Securities. If other than an individual, Holder also represents it has not been organized solely for the purpose of acquiring the Securities.

(iv) Holder is an "accredited investor" within the meaning of Rule 501 of Regulation D of the Securities and Exchange Commission (the "**SEC**"), as presently in effect.

(v) Holder understands that the Securities are characterized as "restricted securities" under the federal securities laws inasmuch as they are being acquired from the Company in a transaction not involving a public offering and that under such laws and applicable regulations such securities may be resold without registration under the Securities Act of 1933, as amended, only in certain limited circumstances. Holder represents that it is familiar with SEC Rule 144, as presently in effect, and understands the resale limitations imposed thereby and by the Securities Act of 1933, as amended.

(vi) Holder understands that the Securities may bear the following

legend:

> "THESE SECURITIES HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. THEY MAY NOT BE SOLD, OFFERED FOR SALE, PLEDGED, HYPOTHECATED, OR OTHERWISE TRANSFERRED EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY THAT REGISTRATION IS NOT REQUIRED UNDER SUCH ACT OR UNLESS SOLD PURSUANT TO RULE 144 UNDER SUCH ACT."

6. Covenants of the Company.

(a) Notices of Record Date. In the event of any taking by the Company of a record of the holders of any class of securities for the purpose of determining the holders thereof who are entitled to receive any dividend (other than a cash dividend which is the same as cash dividends paid in previous quarters or a stock dividend) or other distribution, the Company shall mail to the Holder, at least ten (10) days prior to such record date, a notice specifying the date on which any such record is to be taken for the purpose of such dividend or distribution.

(b) Covenants as to Exercise Shares. The Company covenants and agrees that all Conversion Shares that may be issued upon the exercise of the rights represented by this Warrant will, upon issuance in accordance with the terms hereof, be validly issued and outstanding, fully paid and nonassessable, and free from all taxes, liens and charges with respect to the issuance thereof. The Company further covenants and agrees that the Company will at all times during the Exercise Period have authorized and reserved, free from preemptive rights, a sufficient number of shares of its Preferred Stock to provide for the exercise of the rights represented by this Warrant. If at any time during the Exercise Period the number of authorized but unissued shares of Preferred Stock shall not be sufficient to permit exercise of this Warrant, the Company will take such corporate action as may, in the opinion of its counsel, be necessary to increase its authorized but unissued shares of Preferred Stock to such number of shares as shall be sufficient for such purposes.

7. Adjustment of Exercise Price and Number of Conversion Shares. The number and kind of Conversion Shares purchasable upon exercise of this Warrant and the Exercise Price shall be subject to adjustment from time to time as follows:

(a) Subdivisions, Combinations and Other Issuances. If the Company shall at any time after the issuance but prior to the expiration of this Warrant subdivide its Preferred Stock, by split-up or otherwise, or combine its Preferred Stock, or issue additional shares of its Preferred Stock or Common Stock as a dividend with respect to any shares of its Preferred Stock, the number of Conversion Shares issuable on the exercise of this Warrant shall forthwith be proportionately increased in the case of a subdivision or stock dividend, or proportionately decreased in the case of a combination. Appropriate adjustments shall also be made to the Exercise Price payable per share, but the aggregate Exercise Price payable for the total number of Conversion Shares purchasable under this Warrant (as adjusted) shall remain the same. Any adjustment under this Section 7(a) shall become effective at the close of business on the date the subdivision or combination becomes effective, or as of the record date of such dividend, or in the event that no record date is fixed, upon the making of such dividend.

(b) Reclassification, Reorganization and Consolidation. In case of any reclassification, capital reorganization or change in the capital stock of the Company (other than as a result of a subdivision, combination or stock dividend provided for in Section 7(a) above), then, as a condition of such reclassification, reorganization or change, lawful provision shall be made, and duly executed documents evidencing the same from the Company or its successor shall be delivered to the Holder, so that the Holder shall have the right at any time prior to the expiration of this Warrant to purchase, at a total price equal to that payable upon the exercise of this Warrant, the kind and amount of shares of stock and other securities or property receivable in connection with such reclassification, reorganization or change by a holder of the same number and type of securities as were purchasable as Conversion Shares by the Holder immediately prior to such reclassification, reorganization or change. In any such case appropriate provisions shall be made with respect to the rights and interest of the Holder so that the provisions hereof shall thereafter be applicable with respect to any shares of stock or other securities or property deliverable upon exercise hereof, and appropriate adjustments shall be made to the Exercise Price per Conversion Share payable hereunder, provided the aggregate Exercise Price shall remain the same.

(c) Corporate Transaction. In the event of a Corporate Transaction, pursuant to which the Holder would have been entitled to receive cash consideration per Conversion Share in an amount greater than the Exercise Price if the Holder had exercised its rights pursuant to this Warrant immediately prior thereto, the Company shall pay to the Holder, at the closing of such transaction, an amount equal to (i) the number of Conversion Shares issuable hereunder, multiplied by (ii) the difference of (A) the cash consideration per Conversion Share that the Holder would have received if it had exercised its rights pursuant to this Warrant immediately prior to the closing of such transaction, minus (B) the Exercise Price. This Warrant, and all rights of the Holder hereunder, shall automatically be terminated immediately upon delivery of such payment. If the Holder would have been entitled to receive cash consideration per Share in an amount equal to or less than the Warrant Price if the Holder had exercised its rights pursuant to this Warrant immediately prior to any such transaction, then this Warrant, and all rights of the Holder hereunder, shall automatically be terminated upon the closing of any such transaction.

(d) Adjustments for Diluting Issuances. Without duplication of any adjustment otherwise provided for in this Section 7, the number of shares of common stock issuable upon conversion of the Conversion Shares shall be subject to anti-dilution adjustment from time to time in the manner set forth in the Company's Certificate of Incorporation as if the Conversion Shares were issued and outstanding on and as of the date of any such required adjustment.

(e) Notice of Adjustment. When any adjustment is required to be made in the number or kind of shares purchasable upon exercise of the Warrant, or in the Exercise Price, the Company shall promptly notify the Holder of such event and of the number of Conversion Shares or other securities or property thereafter purchasable upon exercise of this Warrant.

(f) Conversion of Preferred Stock. In the event that all outstanding shares of Preferred Stock are converted to Common Stock, or any other security, in accordance with the terms of the Restated Certificate in connection with the IPO, a Corporate Transaction or other event, this Warrant shall become exercisable for Common Stock or such other security.

8. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant, but in lieu of such fractional shares the Company shall make a cash payment therefor on the basis of the Exercise Price then in effect.

9. No Stockholder Rights. Other than in respect of the adjustments provided in Section 7 hereof, prior to exercise of this Warrant, the Holder shall not be entitled to any rights of a stockholder with respect to the Conversion Shares, including (without limitation) the right to vote such Conversion Shares, receive dividends or other distributions thereon, exercise preemptive rights or be notified of stockholder meetings, and except as otherwise provided in this Warrant or the Purchase Agreement, such Holder shall not be entitled to any stockholder notice or other communication concerning the business or affairs of the Company.

10. Notice of Certain Events. If the Company proposes at any time to:

(a) declare any dividend or distribution upon the outstanding shares of the Company's capital stock, whether in cash, property, stock, or other securities and whether or not a regular cash dividend;

(b) effect any reclassification, exchange, combination, substitution, reorganization or recapitalization of the outstanding shares of the Company's capital stock;

(c) effect a Corporate Transaction or to liquidate, dissolve or wind up; or

(d) effect the IPO;

then, in connection with each such event, the Company shall give Holder:

(i) at least seven (7) Business Days prior written notice of the date on which a record will be taken for such dividend, distribution, or subscription rights (and specifying the date on which the holders of outstanding shares of the Company's capital stock will be entitled thereto) or for determining rights to vote, if any, in respect of the matters referred to in (a) above;

(ii) in the case of the matters referred to in (b) and (c) above at least seven (7) business days prior written notice of the date when the same will take place (and specifying the date on which the holders of outstanding shares of the Company's capital stock will be entitled to exchange their shares for the securities or other property deliverable upon the occurrence of such event and such reasonable information as Holder may reasonably require regarding the treatment of this Warrant in connection with such event giving rise to the notice); and

(iii) with respect to the IPO, at least seven (7) business days prior written notice of the date on which the Company proposes to file its registration statement in connection therewith.

Company will also provide information requested by Holder that is reasonably necessary to enable Holder to comply with Holder's accounting or reporting requirements.

11. Transfer of Warrant. Subject to compliance with applicable federal and state securities laws, this Warrant and all rights hereunder are transferable in whole or in part by the Holder to any person or entity upon written notice to the Company. Within a reasonable time after the Company's receipt of an executed Assignment Form in the form attached hereto, the transfer shall be recorded on the books of the Company upon the surrender of this Warrant, properly endorsed, to the Company at its principal offices, and the payment to the Company of all transfer taxes and other governmental charges imposed on such transfer. In the event of a partial transfer, the Company shall issue to the new holders one or more appropriate new warrants.

12. Governing Law. This Warrant and any controversy arising out of or relating to this Warrant shall be governed by, and construed in accordance with, the internal laws of the State of Delaware, without regard to conflict of law principles that would result in the application of any law other than the law of the State of Delaware.

13. Successors and Assigns. The terms and provisions of this Warrant shall inure to the benefit of, and be binding upon, the Company and the holders hereof and their respective successors and assigns.

14. Titles and Subtitles. The titles and subtitles used in this Warrant are used for convenience only and are not to be considered in construing or interpreting this Warrant.

15. Notices. All notices and other communications given or made pursuant hereto shall be in writing and shall be deemed effectively given: (a) upon personal delivery to the party to be notified, (b) when sent by confirmed electronic mail or facsimile if sent during normal business hours of the recipient, and if not so confirmed, then on the next business day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) day after deposit with a nationally recognized overnight courier, specifying next day delivery, with written verification of receipt. All communications shall be sent to the respective parties at the following addresses (or at such other addresses as shall be specified by notice given in accordance with this Section 15):

If to the Company:

RAPID MICRO BIOSYSTEMS, INC.
1001 Pawtucket Blvd.
Lowell, MA 01854
Attention: Chief Executive

Officer If to Holders:

At the addresses shown on the signature pages hereto.

16. Amendments and Waivers. This Warrant is one of a series of Warrants to Purchase Shares of Preferred Stock in substantially the same form and issued as part of a bridge financing consummated by the Company and the other parties thereto on or about March 4, 2016 (collectively, the "**Warrants**"). Any term of this Warrant may be amended and the observance of any term of this Warrant may be waived (either generally or in a particular instance and either retroactively or prospectively), with the written consent of the Company and the holders of Warrants holding at least 66% of the Conversion Shares issuable upon exercise of the Warrants; provided that such amendment affects each such holder in materially the same manner. Any waiver or amendment effected in accordance with this Section shall be binding upon each party to a Warrant at the time outstanding and each future holder of all such Warrants.

17. Severability. If any provision of this Warrant is held to be unenforceable under applicable law, such provision shall be excluded from this Warrant and the balance of the Warrant shall be interpreted as if such provision were so excluded and shall be enforceable in accordance with its terms.

[Signature Page Follows]

IN WITNESS WHEREOF, the parties have executed this Warrant as of the date first written above.

RAPID MICRO BIOSYSTEMS, INC.

By: _____
President and Chief Executive Officer

[Signature Page to Warrant]

IN WITNESS WHEREOF, the parties have executed this Warrant as of the date first written above.

Name:

[Signature Page to Warrant]

NOTICE OF EXERCISE

RAPID MICRO BIOSYSTEMS, INC.

Attention: Corporate Secretary

The undersigned hereby elects to purchase, pursuant to the provisions of the Warrant, as follows:

☐ _____ Conversion Shares pursuant to the terms of the attached Warrant, and tenders herewith payment in cash of the Exercise Price of such Conversion Shares in full, together with all applicable transfer taxes, if any.

☐ Net Exercise the attached Warrant with respect to _____ Conversion Shares.

The undersigned hereby represents and warrants that Representations and Warranties in Section 5(b) of the Warrant are true and correct as of the date hereof.

HOLDER:

Date: _____ By: _____

Address: _____

_____

Name in which shares should be registered:

_____

_____

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute
this form and supply required information.
Do not use this form to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: _____
(Please Print)

Address: _____
(Please Print)

Dated: _____

Holder's
Signature: _____

Holder's
Address: _____

NOTE: The signature to this Assignment Form must correspond with the name as it appears on the face of the Warrant. Officers of corporations and those acting in a fiduciary or other representative capacity should provide proper evidence of authority to assign the foregoing Warrant.

Schedule of Holders of Warrants
to Purchase Common Stock

Name	Date of Issuance	Expiration Date	Conversion Shares Numerator
Andrea Monath Schumacher	September 29, 2016	September 29, 2026	$ 3,613.04
Andrew Khouri	September 29, 2016	September 29, 2026	$ 225.00
Biomedical Sciences Investment Fund Pte Ltd	September 29, 2016	September 29, 2026	$ 82,164.96
Fletcher Spaght Ventures II, L.P.	September 29, 2016	September 29, 2026	$ 238.49
Foster & Foster Capital V LLC	September 29, 2016	September 29, 2026	$ 24,649.49
Foundation Investments of Ohio Ltd.	September 29, 2016	September 29, 2026	$ 16,432.98
FSV II, L.P.	September 29, 2016	September 29, 2026	$ 23.99
FSV II-B, L.P.	September 29, 2016	September 29, 2026	$ 113.56
Hepalink USA Inc.	October 5, 2016	October 5, 2026	$ 82,164.96
KPCB Holdings, Inc.	September 29, 2016	September 29, 2026	$ 90,325.99
Longitude Venture Partners II, L.P.	September 29, 2016	September 29, 2026	$ 214,203.70
Manbro P.E. IV, LP	September 29, 2016	September 29, 2026	$ 41,082.47
Margaret Blake Garvan Trust Margaret B Garvan And Thomas P Monath Co-TTE UA 11-01-2001	September 29, 2016	September 29, 2026	$ 6,774.45
Mellon Family Investment Company V	September 29, 2016	September 29, 2026	$ 24,649.49
MSF Private Equity Fund LLC	September 29, 2016	September 29, 2026	$ 24,649.49
Philip Stewart	September 29, 2016	September 29, 2026	$ 1,643.28
Quaker Bioventures II, L.P.	September 29, 2016	September 29, 2026	$ 194,744.47
Richard King Mellon Foundation	September 29, 2016	September 29, 2026	$ 24,649.49
Robert Spignesi	September 29, 2016	September 29, 2026	$ 985.98
TPG RAMB Holdings, L.P.	September 29, 2016	September 29, 2026	$ 160,652.79
TVM Life Science Ventures VI GmbH & Co. KG	September 29, 2016	September 29, 2026	$ 83,157.07
TVM Life Science Ventures VI, L.P.	September 29, 2016	September 29, 2026	$ 28,503.67
Waycross Ventures LLC	September 29, 2016	September 29, 2026	$ 22,581.50
Andrea Monath Schumacher	December 16, 2016	September 29, 2026	$ 3,613.04
Andrew Khouri	December 16, 2016	September 29, 2026	$ 225.00
Biomedical Sciences Investment Fund Pte Ltd	December 16, 2016	September 29, 2026	$ 82,164.96
Fletcher Spaght Ventures II, L.P.	December 16, 2016	September 29, 2026	$ 238.49
Foster & Foster Capital V LLC	December 16, 2016	September 29, 2026	$ 24,649.49
Foundation Investments of Ohio Ltd.	December 16, 2016	September 29, 2026	$ 16,432.98
FSV II, L.P.	December 16, 2016	September 29, 2026	$ 23.99
FSV II-B, L.P.	December 16, 2016	September 29, 2026	$ 113.56
Hepalink USA Inc.	December 16, 2016	September 29, 2026	$ 82,164.96
KPCB Holdings, Inc.,	December 16, 2016	September 29, 2026	$ 90,325.99
Longitude Venture Partners II, L.P.	December 16, 2016	September 29, 2026	$ 214,203.70
Manbro P.E. IV, LP	December 16, 2016	September 29, 2026	$ 41,082.47
Margaret Blake Garvan Trust Margaret B Garvan And Thomas P Monath Co-TTE UA 11-01-2001	December 16, 2016	September 29, 2026	$ 6,774.45
Mellon Family Investment Company V	December 16, 2016	September 29, 2026	$ 24,649.49
MSF Private Equity Fund LLC	December 16, 2016	September 29, 2026	$ 24,649.49
Philip Stewart	December 16, 2016	September 29, 2026	$ 1,643.28

Quaker Bioventures II, L.P.	December 16, 2016	September 29, 2026	$	194,744.47
Richard King Mellon Foundation	December 16, 2016	September 29, 2026	$	24,649.49
Robert Spignesi	December 16, 2016	September 29, 2026	$	985.98
TPG RAMB Holdings, L.P.	December 16, 2016	September 29, 2026	$	160,652.79
TVM Life Science Ventures VI GmbH & Co. KG	December 16, 2016	September 29, 2026	$	83,157.07
TVM Life Science Ventures VI, L.P.	December 16, 2016	September 29, 2026	$	28,503.67
Waycross Ventures LLC	December 16, 2016	September 29, 2026	$	22,581.50
Andrea Monath Schumacher	March 30, 2017	September 29, 2026	$	2,408.69
Biomedical Sciences Investment Fund Pte Ltd	March 30, 2017	September 29, 2026	$	54,776.64
Foster & Foster Capital V LLC	March 30, 2017	September 29, 2026	$	16,432.99
Foundation Investments of Ohio Ltd.	March 30, 2017	September 29, 2026	$	10,955.32
Hepalink USA Inc.	March 30, 2017	September 29, 2026	$	54,776.64
KPCB Holdings Inc.	March 30, 2017	September 29, 2026	$	60,217.32
Longitude Venture Partners II, L.P.	March 30, 2017	September 29, 2026	$	142,802.47
Manbro P.E. IV, LP	March 30, 2017	September 29, 2026	$	27,388.31
Margaret Blake Garvan Trust Margaret B Garvan And Thomas P Monath Co-TTE UA 11-01-2001	March 30, 2017	September 29, 2026	$	4,516.30
Mellon Family Investment Company V	March 30, 2017	September 29, 2026	$	16,432.99
MSF Private Equity Fund LLC	March 30, 2017	September 29, 2026	$	16,432.99
Quaker Bioventures II, L.P.	March 30, 2017	September 29, 2026	$	129,829.65
Richard King Mellon Foundation	March 30, 2017	September 29, 2026	$	16,432.99
TPG RAMB Holdings, L.P.	March 30, 2017	September 29, 2026	$	107,101.86
TVM Life Science Ventures VI GmbH & Co. KG	March 30, 2017	September 29, 2026	$	55,438.05
TVM Life Science Ventures VI, L.P.	March 30, 2017	September 29, 2026	$	19,002.44
Waycross Ventures LLC	March 30, 2017	September 29, 2026	$	15,054.33

THIS WARRANT AND THE SECURITIES ISSUABLE UPON THE EXERCISE HEREOF HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. THEY MAY NOT BE SOLD, OFFERED FOR SALE, PLEDGED, HYPOTHECATED, OR OTHERWISE TRANSFERRED EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY THAT REGISTRATION IS NOT REQUIRED UNDER SUCH ACT OR UNLESS SOLD PURSUANT TO RULE 144 UNDER SUCH ACT.

Date of Issuance:
_____ __, ____

Void after _____ __, 2026,
[unless earlier terminated pursuant to the terms hereof]

RAPID MICRO BIOSYSTEMS, INC.
WARRANT TO PURCHASE SHARES OF PREFERRED STOCK

This Warrant is issued to _____ or [his][her][its] assigns (the "**Holder**") by Rapid Micro Biosystems, Inc., a Delaware corporation (the "**Company**"), pursuant to that certain Note and Warrant Purchase Agreement dated September 6, 2016 among the Company, the Holder and certain other investors, as the same may be amended, restated or otherwise modified from time to time (the "**Purchase Agreement**"). Unless otherwise defined herein or in the Purchase Agreement, capitalized terms shall have the following meanings:

"**Conversion Shares**" shall mean (a) shares of such series of Preferred Stock as are issued in the Next Equity Financing if the Next Equity Financing is consummated on or prior to [June 30][March 31], 2017; or (b) shares of Series C Preferred Stock if the Next Equity Financing has not been consummated on or prior to [June 30][March 31], 2017.

"**Corporate Transaction**" shall mean (A) the closing of the sale, transfer or other disposition of all or substantially all of the Company's assets, (B) the consummation of the merger or consolidation of the Company with or into another entity (except a merger or consolidation in which the holders of capital stock of the Company immediately prior to such merger or consolidation continue to hold at least 50% of the voting power of the capital stock of the Company or the surviving or acquiring entity), or (C) the closing of the transfer (whether by merger, consolidation or otherwise), in one transaction or a series of related transactions, to a person or group of affiliated persons (other than an underwriter of this corporation's securities), of the Company's securities if, after such closing, such person or group of affiliated persons would hold 50% or more of the outstanding voting stock of this corporation (or the surviving or acquiring entity); provided, however, that a transaction shall not constitute a Corporate Transaction if its sole purpose is to change the state of the Company's incorporation or to create a holding company that will be owned in substantially the same proportions by the persons who held the Company's securities immediately prior to such transaction. Notwithstanding the prior sentence, the sale of shares of Preferred Stock in a bona fide financing transaction shall not be deemed a Corporate Transaction.

"**Exercise Price**" shall mean: (a) the Next Round Price if this Warrant is exercisable for shares of Preferred Stock issued in the Next Equity Financing; or (b) $1.19583365 (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar event with respect to the Series C Preferred Stock) if this Warrant is exercisable for shares of Series C Preferred Stock.

"**Next Equity Financing**" shall mean the next sale (or series of related sales) by the Company of its Preferred Stock following the Original Date of Issuance from which the Company receives aggregate gross proceeds of not less than $10,000,000 (excluding the aggregate amount of any indebtedness of the Company converted into Preferred Stock in the Next Equity Financing).

"**Next Round Price**" shall mean the price per share of Preferred Stock paid by the investors in the Next Equity Financing (excluding, if applicable, any discounts applied to the purchase price of any Preferred Stock issued in the Next Equity Financing upon conversion or cancellation of indebtedness).

"**Original Date of Issuance**" shall mean _____.

"**Preferred Stock**" shall mean the Company's preferred stock, $0.01 par value

per share.

"**Series C Preferred Stock**" shall mean the Company's Series C Preferred Stock,

$0.01 par value per share.

1. Purchase of Shares; Number of Conversion Shares and Exercise Price. Subject to the terms and conditions set forth herein, the Holder is entitled, upon surrender of this Warrant at the principal office of the Company (or at such other place as the Company shall notify the Holder in writing), to purchase from the Company up to a number of fully paid and nonassessable Conversion Shares equal to $_____.__ divided by the Exercise Price. The Conversion Shares and the Exercise Price of the Conversion Shares shall be subject to adjustment pursuant to Section 7 hereof.

2. Exercise Period; Termination. Unless earlier terminated pursuant to the terms hereof, this Warrant shall be exercisable, in whole or in part, during the period commencing on the Original Date of Issuance and ending at 5:00 p.m. pacific time on _____ __, 2026 (the "**Exercise Period**"). In the event that this Warrant has not been otherwise terminated pursuant to this Section 2, upon the expiration of the Exercise Period, if the fair market value of one Conversion Share (or other security issuable upon the exercise hereof) as determined in accordance with Section 4 below is greater than the Exercise Price in effect on such date, then this Warrant, to the extent then exercisable, shall automatically be deemed on and as of such date to be exercised pursuant to Section 4 below as to all Conversion Shares (or such other securities) for which it shall not have been previously exercised, and the Company shall, within a reasonable time, deliver a certificate representing the Conversion Shares (or such other securities) issued upon such exercise to Holder.

3. Method of Exercise.

(a) While this Warrant remains outstanding and exercisable in accordance with Section 2 above, the Holder may exercise, in whole or in part, the purchase rights evidenced hereby. Such exercise shall be effected by:

(i) the surrender of the Warrant, together with a duly executed copy of the Notice of Exercise attached hereto, to the Secretary of the Company at its principal office (or at such other place as the Company shall notify the Holder in writing); and

(ii) the payment to the Company of an amount equal to the aggregate Exercise Price for the number of Conversion Shares being purchased.

(b) Each exercise of this Warrant shall be deemed to have been effected immediately prior to the close of business on the day on which this Warrant is surrendered to the Company as provided in Section 3(a) above. At such time, the person or persons in whose name or names any certificate for the Conversion Shares shall be issuable upon such exercise as provided in Section 3(c) below shall be deemed to have become the holder or holders of record of the Conversion Shares represented by such certificate.

(c) As soon as practicable after the exercise of this Warrant in whole or in part, and in any event within twenty (20) days thereafter, the Company at its expense will cause to be issued in the name of, and delivered to, the Holder, or as such Holder (upon payment by such Holder of any applicable transfer taxes) may direct:

(i) a certificate or certificates for the number of Conversion Shares to which such Holder shall be entitled, and

(ii) in case such exercise is in part only, a new warrant or warrants (dated the date hereof) of like tenor, calling in the aggregate on the face or faces thereof for the number of Conversion Shares equal to the number of such Conversion Shares called for on the face of this Warrant minus the number of Conversion Shares purchased by the Holder upon all exercises made in accordance with Section 3(a) above or Section 4 below.

4. Net Exercise. In lieu of exercising this Warrant for cash, the Holder may elect to receive shares equal to the value of this Warrant (or the portion thereof being exercised) by surrender of this Warrant at the principal office of the Company together with notice of such election (a "**Net Exercise**"). A Holder who Net Exercises shall have the rights described in Sections 3(b) and 3(c) hereof, and the Company shall issue to such Holder a number of Conversion Shares computed using the following formula:

$$X = \frac{Y(A-B)}{A}$$

Where

X = The number of Conversion Shares to be issued to the Holder.

Y = The number of Conversion Shares purchasable under this Warrant or, if only a portion of the Warrant is being exercised, the portion of the Warrant being cancelled (at the date of such calculation).

A = The fair market value of one (1) Conversion Share (at the date of such calculation).

B = The Exercise Price (as adjusted to the date of such calculations).

For purposes of this Section 4, the fair market value of a Conversion Share shall mean the average of the closing price of the Conversion Shares (or equivalent shares of Common Stock underlying the Conversion Shares) quoted in the over-the-counter market in which the Conversion Shares (or equivalent shares of Common Stock underlying the Conversion Shares) are traded or the closing price quoted on any exchange or electronic securities market on which the Conversion Shares (or equivalent shares of Common Stock underlying the Warrants) are listed, whichever is applicable, as published in *The Wall Street Journal* for the five (5) trading days prior to the date of determination of fair market value (or such shorter period of time during which such Conversion Shares were traded over-the-counter or on such exchange). In the event that this Warrant is exercised pursuant to this Section 4 in connection with the Company's first underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended (the "**IPO**"), the fair market value per Conversion Share shall be the product of (a) the per share offering price to the public of the IPO, and (b) the number of shares of Common Stock into which each Conversion Share is convertible at the time of such exercise or, if the Conversion Shares are shares of Common Stock, one. In the event that this Warrant is exercised not in connection with the IPO and the Conversion Shares are not traded on the over- the-counter market, an exchange or an electronic securities market, the fair market value shall be the price per Conversion Share that the Company could obtain from a willing buyer for Conversion Shares sold by the Company from authorized but unissued Conversion Shares, as such prices shall be determined in reasonable good faith by the Company's Board of Directors.

5. [Omitted.]

6. Covenants of the Company.

(a) Notices of Record Date. In the event of any taking by the Company of a record of the holders of any class of securities for the purpose of determining the holders thereof who are entitled to receive any dividend (other than a cash dividend which is the same as cash dividends paid in previous quarters or a stock dividend) or other distribution, the Company shall mail to the Holder, at least ten (10) days prior to such record date, a notice specifying the date on which any such record is to be taken for the purpose of such dividend or distribution.

(b) Covenants as to Exercise Shares. The Company covenants and agrees that all Conversion Shares that may be issued upon the exercise of the rights represented by this Warrant will, upon issuance in accordance with the terms hereof, be validly issued and outstanding, fully paid and nonassessable, and free from all taxes, liens and charges with respect to the issuance thereof. The Company further covenants and agrees that the Company will at all times during the Exercise Period have authorized and reserved, free from preemptive rights, a sufficient number of shares of its Preferred Stock to provide for the exercise of the rights represented by this Warrant. If at any time during the Exercise Period the number of authorized but unissued shares of Preferred Stock shall not be sufficient to permit exercise of this Warrant, the Company will take such corporate action as may, in the opinion of its counsel, be necessary to increase its authorized but unissued shares of Preferred Stock to such number of shares as shall be sufficient for such purposes.

7. Adjustment of Exercise Price and Number of Conversion Shares. The number and kind of Conversion Shares purchasable upon exercise of this Warrant and the Exercise Price shall be subject to adjustment from time to time as follows:

(a) Subdivisions, Combinations and Other Issuances. If the Company shall at any time after the issuance but prior to the expiration of this Warrant subdivide its Preferred Stock, by split-up or otherwise, or combine its Preferred Stock, or issue additional shares of its Preferred Stock or Common Stock as a dividend with respect to any shares of its Preferred Stock, the number of Conversion Shares issuable on the exercise of this Warrant shall forthwith be proportionately increased in the case of a subdivision or stock dividend, or proportionately decreased in the case of a combination. Appropriate adjustments shall also be made to the Exercise Price payable per share, but the aggregate Exercise Price payable for the total number of Conversion Shares purchasable under this Warrant (as adjusted) shall remain the same. Any adjustment under this Section 7(a) shall become effective at the close of business on the date the subdivision or combination becomes effective, or as of the record date of such dividend, or in the event that no record date is fixed, upon the making of such dividend.

(b) Reclassification, Reorganization and Consolidation. In case of any reclassification, capital reorganization or change in the capital stock of the Company (other than as a result of a subdivision, combination or stock dividend provided for in Section 7(a) above), then, as a condition of such reclassification, reorganization or change, lawful provision shall be made, and duly executed documents evidencing the same from the Company or its successor shall be delivered to the Holder, so that the Holder shall have the right at any time prior to the expiration of this Warrant to purchase, at a total price equal to that payable upon the exercise of this Warrant, the kind and amount of shares of stock and other securities or property receivable in connection with such reclassification, reorganization or change by a holder of the same number and type of securities as were purchasable as Conversion Shares by the Holder immediately prior to such reclassification, reorganization or change. In any such case appropriate provisions shall be made with respect to the rights and interest of the Holder so that the provisions hereof shall thereafter be applicable with respect to any shares of stock or other securities or property deliverable upon exercise hereof, and appropriate adjustments shall be made to the Exercise Price per Conversion Share payable hereunder, provided the aggregate Exercise Price shall remain the same.

(c) Corporate Transaction. In the event of a Corporate Transaction, pursuant to which the Holder would have been entitled to receive cash consideration per Conversion Share in an amount greater than the Exercise Price if the Holder had exercised [his][her][its] rights pursuant to this Warrant immediately prior thereto, the Company shall pay to the Holder, at the closing of such transaction, an amount equal to (i) the number of Conversion Shares issuable hereunder, multiplied by (ii) the difference of (A) the cash consideration per Conversion Share that the Holder would have received if [he][she][it] had exercised [his][her][its] rights pursuant to this Warrant immediately prior to the closing of such transaction, minus (B) the Exercise Price. This Warrant, and all rights of the Holder hereunder, shall automatically be terminated immediately upon delivery of such payment. If the Holder would have been entitled to receive cash consideration per Share in an amount equal to or less than the Warrant Price if the Holder had exercised [his][her][its] rights pursuant to this Warrant immediately prior to any such transaction, then this Warrant, and all rights of the Holder hereunder, shall automatically be terminated upon the closing of any such transaction.

(d) Adjustments for Diluting Issuances. Without duplication of any adjustment otherwise provided for in this Section 7, the number of shares of common stock issuable upon conversion of the Conversion Shares shall be subject to anti-dilution adjustment from time to time in the manner set forth in the Company's Certificate of Incorporation as if the Conversion Shares were issued and outstanding on and as of the date of any such required adjustment.

(e) Notice of Adjustment. When any adjustment is required to be made in the number or kind of shares purchasable upon exercise of the Warrant, or in the Exercise Price, the Company shall promptly notify the Holder of such event and of the number of Conversion Shares or other securities or property thereafter purchasable upon exercise of this Warrant.

(f) Conversion of Preferred Stock. In the event that all outstanding shares of Preferred Stock are converted to Common Stock, or any other security, in accordance with the terms of the Restated Certificate in connection with the IPO, a Corporate Transaction or other event, this Warrant shall become exercisable for Common Stock or such other security.

8. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant, but in lieu of such fractional shares the Company shall make a cash payment therefor on the basis of the Exercise Price then in effect.

9. No Stockholder Rights. Other than in respect of the adjustments provided in Section 7 hereof, prior to exercise of this Warrant, the Holder shall not be entitled to any rights of a stockholder with respect to the Conversion Shares, including (without limitation) the right to vote such Conversion Shares, receive dividends or other distributions thereon, exercise preemptive rights or be notified of stockholder meetings, and except as otherwise provided in this Warrant or the Purchase Agreement, such Holder shall not be entitled to any stockholder notice or other communication concerning the business or affairs of the Company.

10. Notice of Certain Events. If the Company proposes at any time to:

(a) declare any dividend or distribution upon the outstanding shares of the Company's capital stock, whether in cash, property, stock, or other securities and whether or not a regular cash dividend;

(b) effect any reclassification, exchange, combination, substitution, reorganization or recapitalization of the outstanding shares of the Company's capital stock;

(c) effect a Corporate Transaction or to liquidate, dissolve or wind up; or

(d) effect the IPO;

then, in connection with each such event, the Company shall give Holder:

(i) at least seven (7) Business Days prior written notice of the date on which a record will be taken for such dividend, distribution, or subscription rights (and specifying the date on which the holders of outstanding shares of the Company's capital stock will be entitled thereto) or for determining rights to vote, if any, in respect of the matters referred to in (a) above;

(ii) in the case of the matters referred to in (b) and (c) above at least seven (7) business days prior written notice of the date when the same will take place (and specifying the date on which the holders of outstanding shares of the Company's capital stock will be entitled to exchange their shares for the securities or other property deliverable upon the occurrence of such event and such reasonable information as Holder may reasonably require regarding the treatment of this Warrant in connection with such event giving rise to the notice); and

(iii) with respect to the IPO, at least seven (7) business days prior written notice of the date on which the Company proposes to file its registration statement in connection therewith.

Company will also provide information requested by Holder that is reasonably necessary to enable Holder to comply with Holder's accounting or reporting requirements.

11. Transfer of Warrant. Subject to compliance with applicable federal and state securities laws, this Warrant and all rights hereunder are transferable in whole or in part by the Holder to any person or entity upon written notice to the Company. Within a reasonable time after the Company's receipt of an executed Assignment Form in the form attached hereto, the transfer shall be recorded on the books of the Company upon the surrender of this Warrant, properly endorsed, to the Company at its principal offices, and the payment to the Company of all transfer taxes and other governmental charges imposed on such transfer. In the event of a partial transfer, the Company shall issue to the new holders one or more appropriate new warrants.

12. Successors and Assigns. The terms and provisions of this Warrant shall inure to the benefit of, and be binding upon, the Company and the holders hereof and their respective successors and assigns.

13. Titles and Subtitles. The titles and subtitles used in this Warrant are used for convenience only and are not to be considered in construing or interpreting this Warrant.

14. Amendments and Waivers; Resolution of Controversies; Notices. The amendment or waiver of any term of this Warrant, the resolution of any controversy or claim arising out of or relating to this Warrant and the provision of any notices under this Warrant shall be conducted pursuant to the terms of the Purchase Agreement.

15. Severability. If any provision of this Warrant is held to be unenforceable under applicable law, such provision shall be excluded from this Warrant and the balance of the Warrant shall be interpreted as if such provision were so excluded and shall be enforceable in accordance with its terms.

IN WITNESS WHEREOF, the parties have executed this Warrant as of the date first written above.

RAPID MICRO BIOSYSTEMS, INC.

By: _____
President and Chief Executive Officer

IN WITNESS WHEREOF, the parties have executed this Warrant as of the date first written above.

By: _____
Name:

NOTICE OF EXERCISE

RAPID MICRO BIOSYSTEMS, INC.

Attention: Corporate Secretary

The undersigned hereby elects to purchase, pursuant to the provisions of the Warrant, as follows:

☐ _____ Conversion Shares pursuant to the terms of the attached Warrant, and tenders herewith payment in cash of the Exercise Price of such Conversion Shares in full, together with all applicable transfer taxes, if any.

☐ Net Exercise the attached Warrant with respect to _____ Conversion Shares.

The undersigned hereby represents and warrants that Representations and Warranties of the undersigned in Section 5 of the Purchase Agreement are true and correct as of the date hereof.

HOLDER:

Date: _____ By: _____

Address: _____

_____

Name in which shares should be registered:

_____

_____

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute
this form and supply required information.
Do not use this form to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: _____
(Please Print)

Address: _____
(Please Print)

Dated: _____

Holder's
Signature: _____

Holder's
Address: _____

NOTE: The signature to this Assignment Form must correspond with the name as it appears on the face of the Warrant. Officers of corporations and those acting in a fiduciary or other representative capacity should provide proper evidence of authority to assign the foregoing Warrant.

Exhibit 4.3

Schedule of Holders
of
Warrants to Purchase Series A1 Preferred Stock
Of Rapid Micro Biosystems, Inc.

Holder	Number of Shares	Issuance Date	Expiration Date
Foster & Foster Capital V LLC	39,266	July 24, 2017	July 24, 2027
Longitude Venture Partners II, L.P.	2,500,000	July 24, 2017	July 24, 2027
Mellon Family Investment Company V	273,227	July 24, 2017	July 24, 2027
Quaker Bioventures II, L.P.	410,051	July 24, 2017	July 24, 2027
Richard King Mellon Foundation	273,227	July 24, 2017	July 24, 2027
TVM Life Science Ventures VI GmbH & Co. K.G.	244,093	July 24, 2017	July 24, 2027
TVM Life Science Ventures VI, L.P.	83,660	July 24, 2017	July 24, 2027

THIS WARRANT AND THE SECURITIES ISSUABLE UPON THE EXERCISE HEREOF HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. THEY MAY NOT BE SOLD, OFFERED FOR SALE, PLEDGED, HYPOTHECATED, OR OTHERWISE TRANSFERRED EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY THAT REGISTRATION IS NOT REQUIRED UNDER SUCH ACT OR UNLESS SOLD PURSUANT TO RULE 144 UNDER SUCH ACT.

Date of Issuance:
July 24, 2017

Void after July 24, 2027, unless earlier terminated pursuant to the terms hereof

RAPID MICRO BIOSYSTEMS, INC.
WARRANT TO PURCHASE SHARES OF SERIES A1 PREFERRED STOCK

This Warrant (this "**Warrant**") is issued to [ ] or his, her or its assigns (the "**Holder**") by Rapid Micro Biosystems, Inc., a Delaware corporation (the "**Company**"), pursuant to that certain Series A1 Preferred Stock Purchase Agreement dated as of July 24, 2017 among the Company, the Holder and certain other investors, as the same may be amended, restated or otherwise modified from time to time (the "**Purchase Agreement**" and all warrants issued under the Purchase Agreement collectively, the "**Warrants**").

Unless otherwise defined herein or in the Purchase Agreement, capitalized terms shall have the following meanings:

"**Corporate Transaction**" shall mean (A) the closing of the sale, transfer or other disposition of all or substantially all of the Company's assets, (B) the consummation of the merger or consolidation of the Company with or into another entity (except a merger or consolidation in which the holders of capital stock of the Company immediately prior to such merger or consolidation continue to hold at least 50% of the voting power of the capital stock of the Company or the surviving or acquiring entity), or (C) the closing of the transfer (whether by merger, consolidation or otherwise), in one transaction or a series of related transactions, to a person or group of affiliated persons (other than an underwriter of this corporation's securities), of the Company's securities if, after such closing, such person or group of affiliated persons would hold 50% or more of the outstanding voting stock of this corporation (or the surviving or acquiring entity); provided, however, that a transaction shall not constitute a Corporate Transaction if its sole purpose is to change the state of the Company's incorporation or to create a holding company that will be owned in substantially the same proportions by the persons who held the Company's securities immediately prior to such transaction. Notwithstanding the prior sentence, the sale of shares of Preferred Stock in a bona fide financing transaction shall not be deemed a Corporate Transaction.

"**Exercise Price**" shall mean $0.01 per Share.

"**Original Date of Issuance**" shall mean July 24, 2017.

"**Preferred Stock**" shall mean the Company's Series A1 Preferred Stock, $0.01 par value per share.

"**Shares**" shall mean shares of Preferred Stock.

1. Purchase of Shares; Number of Shares and Exercise Price. Subject to the terms and conditions set forth herein, the Holder is entitled, upon surrender of this Warrant at the principal office of the Company (or at such other place as the Company shall notify the Holder in writing), to purchase from the Company up to [ ] fully paid and nonassessable Shares. The Shares and the Exercise Price of the Shares shall be subject to adjustment pursuant to Section 6 hereof.

2. Exercise Period; Termination. Unless earlier terminated pursuant to the terms hereof, this Warrant shall be exercisable, in whole or in part, during the period commencing on the Original Date of Issuance and ending at 5:00 p.m. pacific time on July 24, 2027 (the "**Exercise Period**"). In the event that this Warrant has not been otherwise terminated pursuant to this Section 2, upon the expiration of the Exercise Period, if the fair market value of one Conversion Share (or other security issuable upon the exercise hereof) as determined in accordance with Section 4 below is greater than the Exercise Price in effect on such date, then this Warrant, to the extent then exercisable, shall automatically be deemed on and as of such date to be exercised pursuant to Section 4 below as to all Shares (or such other securities) for which it shall not have been previously exercised, and the Company shall, within a reasonable time, deliver a certificate representing the Shares (or such other securities) issued upon such exercise to Holder.

3. Method of Exercise.

(a) While this Warrant remains outstanding and exercisable in accordance with Section 2 above, the Holder may exercise, in whole or in part, the purchase rights evidenced hereby. Such exercise shall be effected by:

(i) the surrender of the Warrant, together with a duly executed copy of the Notice of Exercise attached hereto, to the Secretary of the Company at its principal office (or at such other place as the Company shall notify the Holder in writing); and

(ii) the payment to the Company of an amount equal to the aggregate Exercise Price for the number of Shares being purchased.

(b) Each exercise of this Warrant shall be deemed to have been effected immediately prior to the close of business on the day on which this Warrant is surrendered to the Company as provided in Section 3(a) above. At such time, the person or persons in whose name or names any certificate for the Shares shall be issuable upon such exercise as provided in Section 3(c) below shall be deemed to have become the holder or holders of record of the Shares represented by such certificate.

(c) As soon as practicable after the exercise of this Warrant in whole or in part, and in any event within twenty (20) days thereafter, the Company at its expense will cause to be issued in the name of, and delivered to, the Holder, or as such Holder (upon payment by such Holder of any applicable transfer taxes) may direct:

(i) a certificate or certificates for the number of Shares to which such Holder shall be entitled, and

(ii) in case such exercise is in part only, a new warrant or warrants (dated the date hereof) of like tenor, calling in the aggregate on the face or faces thereof for the number of Shares equal to the number of such Shares called for on the face of this Warrant minus the number of Shares purchased by the Holder upon all exercises made in accordance with Section 3(a) above or Section 4 below.

4. Net Exercise. In lieu of exercising this Warrant for cash, the Holder may elect to receive shares equal to the value of this Warrant (or the portion thereof being exercised) by surrender of this Warrant at the principal office of the Company together with notice of such election (a "**Net Exercise**"). A Holder who Net Exercises shall have the rights described in Sections 3(b) and 3(c) hereof, and the Company shall issue to such Holder a number of Shares computed using the following formula:

$$X = \frac{Y(A - B)}{A}$$

Where

X = The number of Shares to be issued to the Holder.

Y = The number of Shares purchasable under this Warrant or, if only a portion of the Warrant is being exercised, the portion of the Warrant being cancelled (at the date of such calculation).

A = The fair market value of one (1) Conversion Share (at the date of such calculation).

B = The Exercise Price (as adjusted to the date of such calculations).

For purposes of this Section 4, the fair market value of a Conversion Share shall mean the average of the closing price of the Shares (or equivalent shares of Common Stock underlying the Shares) quoted in the over-the-counter market in which the Shares (or equivalent shares of Common Stock underlying the Shares) are traded or the closing price quoted on any exchange or electronic securities market on which the Shares (or equivalent shares of Common Stock underlying the Warrant) are listed, whichever is applicable, as published in *The Wall Street Journal* for the five (5) trading days prior to the date of determination of fair market value (or such shorter period of time during which such Shares were traded over-the-counter or on such exchange). In the event that this Warrant is exercised pursuant to this Section 4 in connection with the Company's first underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended (the "**IPO**"), the fair market value per Conversion Share shall be the product of (a) the per share offering price to the public of the IPO, and (b) the number of shares of Common Stock into which each Conversion Share is convertible at the time of such exercise or, if the Shares are shares of Common Stock, one. In the event that this Warrant is exercised not in connection with the IPO and the Shares are not traded on the over-the-counter market, an exchange or an electronic securities market, the fair market value shall be the price per Conversion Share that the Company could obtain from a willing buyer for Shares sold by the Company from authorized but unissued Shares, as such prices shall be determined in reasonable good faith by the Company's Board of Directors.

5. Covenants of the Company.

(a) Notices of Record Date. In the event of any taking by the Company of a record of the holders of any class of securities for the purpose of determining the holders thereof who are entitled to receive any dividend (other than a cash dividend which is the same as cash dividends paid in previous quarters or a stock dividend) or other distribution, the Company shall mail to the Holder, at least ten (10) days prior to such record date, a notice specifying the date on which any such record is to be taken for the purpose of such dividend or distribution.

(b) Covenants as to Exercise Shares. The Company covenants and agrees that all Shares that may be issued upon the exercise of the rights represented by this Warrant will, upon issuance in accordance with the terms hereof, be validly issued and outstanding, fully paid and nonassessable, and free from all taxes, liens and charges with respect to the issuance thereof. The Company further covenants and agrees that the Company will at all times during the Exercise Period have authorized and reserved, free from preemptive rights, a sufficient number of shares of its Preferred Stock to provide for the exercise of the rights represented by this Warrant. If at any time during the Exercise Period the number of authorized but unissued shares of Preferred Stock shall not be sufficient to permit exercise of this Warrant, the Company will take such corporate action as may, in the opinion of its counsel, be necessary to increase its authorized but unissued shares of Preferred Stock to such number of shares as shall be sufficient for such purposes.

6. Adjustment of Exercise Price and Number of Shares. The number and kind of Shares purchasable upon exercise of this Warrant and the Exercise Price shall be subject to adjustment from time to time as follows:

(a) Subdivisions, Combinations and Other Issuances. If the Company shall at any time after the issuance but prior to the expiration of this Warrant subdivide its Preferred Stock, by split-up or otherwise, or combine its Preferred Stock, or issue additional shares of its Preferred Stock or Common Stock as a dividend with respect to any shares of its Preferred Stock, the number of Shares issuable on the exercise of this Warrant shall forthwith be proportionately increased in the case of a subdivision or stock dividend, or proportionately decreased in the case of a combination. Appropriate adjustments shall also be made to the Exercise Price payable per share, but the aggregate Exercise Price payable for the total number of Shares purchasable under this Warrant (as adjusted) shall remain the same. Any adjustment under this Section 6(a) shall become effective at the close of business on the date the subdivision or combination becomes effective, or as of the record date of such dividend, or in the event that no record date is fixed, upon the making of such dividend.

(b) Reclassification, Reorganization and Consolidation. In case of any reclassification, capital reorganization or change in the capital stock of the Company (other than as a result of a subdivision, combination or stock dividend provided for in Section 6(a) above), then, as a condition of such reclassification, reorganization or change, lawful provision shall be made, and duly executed documents evidencing the same from the Company or its successor shall be delivered to the Holder, so that the Holder shall have the right at any time prior to the expiration of this Warrant to purchase, at a total price equal to that payable upon the exercise of this Warrant, the kind and amount of shares of stock and other securities or property receivable in connection with such reclassification, reorganization or change by a holder of the same number and type of securities as were purchasable as Shares by the Holder immediately prior to such reclassification, reorganization or change. In any such case appropriate provisions shall be made with respect to the rights and interest of the Holder so that the provisions hereof shall thereafter be applicable with respect to any shares of stock or other securities or property deliverable upon exercise hereof, and appropriate adjustments shall be made to the Exercise Price per Conversion Share payable hereunder, provided the aggregate Exercise Price shall remain the same.

(c) Corporate Transaction. In the event of a Corporate Transaction, pursuant to which the Holder would have been entitled to receive cash consideration per Conversion Share in an amount greater than the Exercise Price if the Holder had exercised his, her or its rights pursuant to this Warrant immediately prior thereto, the Company shall pay to the Holder, at the closing of such transaction, an amount equal to (i) the number of Shares issuable hereunder, multiplied by (ii) the difference of (A) the cash consideration per Conversion Share that the Holder would have received if he, she or it had exercised his, her or its rights pursuant to this Warrant immediately prior to the closing of such transaction, minus (B) the Exercise Price. This Warrant, and all rights of the Holder hereunder, shall automatically be terminated immediately upon delivery of such payment. If the Holder would have been entitled to receive cash consideration per Share in an amount equal to or less than the Exercise Price if the Holder had exercised his, her or its rights pursuant to this Warrant immediately prior to any such transaction, then this Warrant, and all rights of the Holder hereunder, shall automatically be terminated upon the closing of any such transaction.

(d) Adjustments for Diluting Issuances. Without duplication of any adjustment otherwise provided for in this Section 6, the number of shares of common stock issuable upon conversion of the Shares shall be subject to anti-dilution adjustment from time to time in the manner set forth in the Company's Certificate of Incorporation as if the Shares were issued and outstanding on and as of the date of any such required adjustment.

(e) Notice of Adjustment. When any adjustment is required to be made in the number or kind of shares purchasable upon exercise of the Warrant, or in the Exercise Price, the Company shall promptly notify the Holder of such event and of the number of Shares or other securities or property thereafter purchasable upon exercise of this Warrant.

(f) Conversion of Preferred Stock. In the event that all outstanding shares of Preferred Stock are converted to Common Stock, or any other security, in accordance with the terms of the Restated Certificate in connection with the IPO, a Corporate Transaction or other event, this Warrant shall become exercisable for Common Stock or such other security.

7. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant, but in lieu of such fractional shares the Company shall make a cash payment therefor on the basis of the Exercise Price then in effect.

8. No Stockholder Rights. Other than in respect of the adjustments provided in Section 6 hereof, prior to exercise of this Warrant, the Holder shall not be entitled to any rights of a stockholder with respect to the Shares, including (without limitation) the right to vote such Shares, receive dividends or other distributions thereon, exercise preemptive rights or be notified of stockholder meetings, and except as otherwise provided in this Warrant or the Purchase Agreement, such Holder shall not be entitled to any stockholder notice or other communication concerning the business or affairs of the Company.

9. Notice of Certain Events. If the Company proposes at any time to:

(a) declare any dividend or distribution upon the outstanding shares of the Company's capital stock, whether in cash, property, stock, or other securities and whether or not a regular cash dividend;

(b) effect any reclassification, exchange, combination, substitution, reorganization or recapitalization of the outstanding shares of the Company's capital stock;

(c) effect a Corporate Transaction or to liquidate, dissolve or wind up; or

(d) effect the IPO;

then, in connection with each such event, the Company shall give Holder:

(i) at least seven (7) business days prior written notice of the date on which a record will be taken for such dividend, distribution, or subscription rights (and specifying the date on which the holders of outstanding shares of the Company's capital stock will be entitled thereto) or for determining rights to vote, if any, in respect of the matters referred to in (a) above;

(ii) in the case of the matters referred to in (b) and (c) above at least seven (7) business days prior written notice of the date when the same will take place (and specifying the date on which the holders of outstanding shares of the Company's capital stock will be entitled to exchange their shares for the securities or other property deliverable upon the occurrence of such event and such reasonable information as Holder may reasonably require regarding the treatment of this Warrant in connection with such event giving rise to the notice); and

(iii) with respect to the IPO, at least seven (7) business days prior written notice of the date on which the Company proposes to file its registration statement in connection therewith.

The Company will also provide information requested by Holder that is reasonably necessary to enable Holder to comply with Holder's accounting or reporting requirements.

10. Transfer of Warrant. Subject to compliance with applicable federal and state securities laws, this Warrant and all rights hereunder are transferable in whole or in part by the Holder to any person or entity upon written notice to the Company. Within a reasonable time after the Company's receipt of an executed Assignment Form in the form attached hereto, the transfer shall be recorded on the books of the Company upon the surrender of this Warrant, properly endorsed, to the Company at its principal offices, and the payment to the Company of all transfer taxes and other governmental charges imposed on such transfer. In the event of a partial transfer, the Company shall issue to the new holders one or more appropriate new warrants.

11. Successors and Assigns. The terms and provisions of this Warrant shall inure to the benefit of, and be binding upon, the Company and the holders hereof and their respective successors and assigns.

12. Titles and Subtitles. The titles and subtitles used in this Warrant are used for convenience only and are not to be considered in construing or interpreting this Warrant.

13. Amendments and Waivers. Any term of this Warrant may be amended and the observance of any term of this Warrant may be waived (either generally or in a particular instance and either retroactively or prospectively), with the written consent of the Company and the holders of Warrants holding a majority of the Shares issuable upon exercise of the Warrants issued pursuant to the Purchase Agreement; provided that such amendment affects each such holder in materially the same manner. Any waiver or amendment effected in accordance with this Section 13 shall be binding upon each holder of a Warrant at the time outstanding and each future holder of all such Warrants.

14. Governing Law. This Warrant and any controversy arising out of or relating to this Warrant shall be governed by, and construed in accordance with, the internal laws of the State of Delaware.

15. Notices. All notices and other communications given or made pursuant hereto shall be in writing and shall be deemed effectively given: (a) upon personal delivery to the party to be notified, (b) when sent by confirmed electronic mail or facsimile if sent during normal business hours of the recipient, and if not so confirmed, then on the next business day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) day after deposit with a nationally recognized overnight courier, specifying next day delivery, with written verification of receipt. All communications shall be sent to the respective parties at the following addresses (or at such other addresses as shall be specified by notice given in accordance with this Section 15):

If to the Company:

RAPID MICRO BIOSYSTEMS, INC.
1001 Pawtucket Blvd.
Lowell, MA 01854
Attention: Chief Executive Officer

If to Holders:

At the addresses shown on the signature pages hereto.

16. Severability. If any provision of this Warrant is held to be unenforceable under applicable law, such provision shall be excluded from this Warrant and the balance of the Warrant shall be interpreted as if such provision were so excluded and shall be enforceable in accordance with its terms.

[*Remainder of Page Intentionally Left Blank*]

IN WITNESS WHEREOF, the parties have executed this Warrant as of the date first written above.

RAPID MICRO BIOSYSTEMS, INC.

By: /s/ Robert Spignesi
Name: Robert Spignesi
Title: President and Chief Executive Officer

IN WITNESS WHEREOF, the parties have executed this Warrant as of the date first written above.

[l]

By: _____
Name: _____
Title: _____

Address:

_____

_____

NOTICE OF EXERCISE

RAPID MICRO BIOSYSTEMS, INC.

Attention: Corporate Secretary

The undersigned hereby elects to purchase, pursuant to the provisions of the Warrant, as follows:

☐ _____ Shares pursuant to the terms of the attached Warrant, and tenders herewith payment in cash of the Exercise Price of such Shares in full, together with all applicable transfer taxes, if any.

☐ Net Exercise the attached Warrant with respect to _____ Shares.

The undersigned hereby represents and warrants that Representations and Warranties of the undersigned in Section 3 of the Purchase Agreement are true and correct as of the date hereof.

HOLDER:

Date: _____ By: _____

Address: _____

_____

Name in which shares should be registered:

_____

_____

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute
this form and supply required information.
Do not use this form to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: _____
(Please Print)

Address: _____
(Please Print)

Dated: _____

Holder's
Signature: _____

Holder's
Address: _____

NOTE: The signature to this Assignment Form must correspond with the name as it appears on the face of the Warrant. Officers of corporations and those acting in a fiduciary or other representative capacity should provide proper evidence of authority to assign the foregoing Warrant.

Exhibit 4.4

Schedule of Holders
of
Warrants to Purchase Series B1 Preferred Stock
Of Rapid Micro Biosystems, Inc.

Holder	Number of Shares	Issuance Date	Expiration Date
Foster & Foster Capital V LLC	19,354	December 6, 2017	December 6, 2027
Foster & Foster Capital V LLC	19,354	January 17, 2018	January 17, 2028
Longitude Venture Partners II, L.P.	322,580	December 6, 2017	December 6, 2027
Longitude Venture Partners II, L.P.	322,580	January 17, 2018	January 17, 2028
Mellon Family Investment Company V	64,516	December 6, 2017	December 6, 2027
Mellon Family Investment Company V	64,516	January 17, 2018	January 17, 2028
Quaker Bioventures II, L.P.	64,516	December 6, 2017	December 6, 2027
Quaker Bioventures II, L.P.	64,516	January 17, 2018	January 17, 2028
Richard King Mellon Foundation	64,516	December 6, 2017	December 6, 2027
Richard King Mellon Foundation	64,516	January 17, 2018	January 17, 2028
TVM Life Science Ventures VI GmbH & Co. K.G.	48,048	December 6, 2017	December 6, 2027
TVM Life Science Ventures VI GmbH & Co. K.G.	48,048	January 17, 2018	January 17, 2028
TVM Life Science Ventures VI, L.P.	16,467	December 6, 2017	December 6, 2027
TVM Life Science Ventures VI, L.P.	16,467	January 17, 2018	January 17, 2028

THIS WARRANT AND THE SECURITIES ISSUABLE UPON THE EXERCISE HEREOF HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. THEY MAY NOT BE SOLD, OFFERED FOR SALE, PLEDGED, HYPOTHECATED, OR OTHERWISE TRANSFERRED EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY THAT REGISTRATION IS NOT REQUIRED UNDER SUCH ACT OR UNLESS SOLD PURSUANT TO RULE 144 UNDER SUCH ACT.

Date of Issuance: [ ] Void after [ ], unless earlier terminated pursuant to the terms hereof

RAPID MICRO BIOSYSTEMS, INC.
WARRANT TO PURCHASE SHARES OF PREFERRED STOCK

This Warrant is issued to [ ] or its assigns (the "**Holder**") by Rapid Micro Biosystems, Inc., a Delaware corporation (the "**Company**"), pursuant to that certain Note and Warrant Purchase Agreement dated December 6, 2017 among the Company, the Holder and certain other investors, as the same may be amended, restated or otherwise modified from time to time (the "**Purchase Agreement**"). Unless otherwise defined herein or in the Purchase Agreement, capitalized terms shall have the following meanings:

"**Conversion Shares**" shall mean (a) shares of such series of Preferred Stock as are issued in the Next Equity Financing if the Next Equity Financing is consummated on or prior to December 6, 2018; or (b) shares of Series A1 Preferred Stock if the Next Equity Financing has not been consummated on or prior to December 6, 2018.

"**Corporate Transaction**" shall mean (A) the closing of the sale, transfer or other disposition of all or substantially all of the Company's assets, (B) the consummation of the merger or consolidation of the Company with or into another entity (except a merger or consolidation in which the holders of capital stock of the Company immediately prior to such merger or consolidation continue to hold at least 50% of the voting power of the capital stock of the Company or the surviving or acquiring entity), or (C) the closing of the transfer (whether by merger, consolidation or otherwise), in one transaction or a series of related transactions, to a person or group of affiliated persons (other than an underwriter of this corporation's securities), of the Company's securities if, after such closing, such person or group of affiliated persons would hold 50% or more of the outstanding voting stock of this corporation (or the surviving or acquiring entity); provided, however, that a transaction shall not constitute a Corporate Transaction if its sole purpose is to change the state of the Company's incorporation or to create a holding company that will be owned in substantially the same proportions by the persons who held the Company's securities immediately prior to such transaction. Notwithstanding the prior sentence, the sale of shares of Preferred Stock in a bona fide financing transaction shall not be deemed a Corporate Transaction.

"**Exercise Price**" shall mean $0.01 (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar event with respect to the Preferred Stock).

"**Next Equity Financing**" shall mean the next sale (or series of related sales) by the Company of its Preferred Stock following the Original Date of Issuance from which the Company receives aggregate gross proceeds of not less than $10,000,000 (excluding the aggregate amount of any indebtedness of the Company converted into Preferred Stock in the Next Equity Financing).

"**Next Round Price**" shall mean the price per share of Preferred Stock paid by the investors in the Next Equity Financing (excluding, if applicable, any discounts applied to the purchase price of any Preferred Stock issued in the Next Equity Financing upon conversion or cancellation of indebtedness).

"**Original Date of Issuance**" shall mean December 6, 2017.

"**Preferred Stock**" shall mean the Company's preferred stock, $0.01 par value per share.

"**Series A1 Preferred Stock**" shall mean the Company's Series A1 Preferred Stock, $0.01 par value per share.

Warrant Price" shall mean: (a) if this Warrant is exercised or converted into Preferred Stock in the Next Equity Financing, the Next Round Price; or (b) if this Warrant is exercised or converted into Series A1 Preferred Stock, $1.00 (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar event with respect to the Series A1 Preferred Stock).

1. Purchase of Shares; Number of Conversion Shares and Exercise Price. Subject to the terms and conditions set forth herein, the Holder is entitled, upon surrender of this Warrant at the principal office of the Company (or at such other place as the Company shall notify the Holder in writing), to purchase from the Company up to a number of fully paid and nonassessable Conversion Shares equal to $[ ] divided by the Warrant Price. The Conversion Shares and the Exercise Price of the Conversion Shares shall be subject to adjustment pursuant to Section 6 hereof.

2. Exercise Period; Termination. Unless earlier terminated pursuant to the terms hereof, this Warrant shall be exercisable, in whole or in part, during the period commencing on the Original Date of Issuance and ending at 5:00 p.m. pacific time on December 6, 2027 (the "**Exercise Period**"). In the event that this Warrant has not been otherwise terminated pursuant to this Section 2, upon the expiration of the Exercise Period, if the fair market value of one Conversion Share (or other security issuable upon the exercise hereof) as determined in accordance with Section 4 below is greater than the Exercise Price in effect on such date, then this Warrant, to the extent then exercisable, shall automatically be deemed on and as of such date to be exercised pursuant to Section 4 below as to all Conversion Shares (or such other securities) for which it shall not have been previously exercised, and the Company shall, within a reasonable time, deliver a certificate representing the Conversion Shares (or such other securities) issued upon such exercise to Holder.

3. Method of Exercise.

(a) While this Warrant remains outstanding and exercisable in accordance with Section 2 above, the Holder may exercise, in whole or in part, the purchase rights evidenced hereby. Such exercise shall be effected by:

(i) the surrender of the Warrant, together with a duly executed copy of the Notice of Exercise attached hereto, to the Secretary of the Company at its principal office (or at such other place as the Company shall notify the Holder in writing); and

(ii) the payment to the Company of an amount equal to the aggregate Exercise Price for the number of Conversion Shares being purchased.

(b) Each exercise of this Warrant shall be deemed to have been effected immediately prior to the close of business on the day on which this Warrant is surrendered to the Company as provided in Section 3(a) above. At such time, the person or persons in whose name or names any certificate for the Conversion Shares shall be issuable upon such exercise as provided in Section 3(c) below shall be deemed to have become the holder or holders of record of the Conversion Shares represented by such certificate.

(c) As soon as practicable after the exercise of this Warrant in whole or in part, and in any event within twenty (20) days thereafter, the Company at its expense will cause to be issued in the name of, and delivered to, the Holder, or as such Holder (upon payment by such Holder of any applicable transfer taxes) may direct:

(i) a certificate or certificates for the number of Conversion Shares to which such Holder shall be entitled, and

(ii) in case such exercise is in part only, a new warrant or warrants (dated the date hereof) of like tenor, calling in the aggregate on the face or faces thereof for the number of Conversion Shares equal to the number of such Conversion Shares called for on the face of this Warrant minus the number of Conversion Shares purchased by the Holder upon all exercises made in accordance with Section 3(a) above or Section 4 below.

4. Net Exercise. In lieu of exercising this Warrant for cash, the Holder may elect to receive shares equal to the value of this Warrant (or the portion thereof being exercised) by surrender of this Warrant at the principal office of the Company together with notice of such election (a "**Net Exercise**"). A Holder who Net Exercises shall have the rights described in Sections 3(b) and 3(c) hereof, and the Company shall issue to such Holder a number of Conversion Shares computed using the following formula:

$$X = \frac{Y(A - B)}{A}$$

Where

X = The number of Conversion Shares to be issued to the Holder.

Y = The number of Conversion Shares purchasable under this Warrant or, if only a portion of the Warrant is being exercised, the portion of the Warrant being cancelled (at the date of such calculation).

A = The fair market value of one (1) Conversion Share (at the date of such calculation).

B = The Exercise Price (as adjusted to the date of such calculations).

For purposes of this Section 4, the fair market value of a Conversion Share shall mean the average of the closing price of the Conversion Shares (or equivalent shares of Common Stock underlying the Conversion Shares) quoted in the over-the-counter market in which the Conversion Shares (or equivalent shares of Common Stock underlying the Conversion Shares) are traded or the closing price quoted on any exchange or electronic securities market on which the Conversion Shares (or equivalent shares of Common Stock underlying the Warrants) are listed, whichever is applicable, as published in *The Wall Street Journal* for the five (5) trading days prior to the date of determination of fair market value (or such shorter period of time during which such Conversion Shares were traded over-the-counter or on such exchange). In the event that this Warrant is exercised pursuant to this Section 4 in connection with the Company's first underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended (the "**IPO**"), the fair market value per Conversion Share shall be the product of (a) the per share offering price to the public of the IPO, and (b) the number of shares of Common Stock into which each Conversion Share is convertible at the time of such exercise or, if the Conversion Shares are shares of Common Stock, one. In the event that this Warrant is exercised not in connection with the IPO and the Conversion Shares are not traded on the over-the-counter market, an exchange or an electronic securities market, the fair market value shall be the price per Conversion Share that the Company could obtain from a willing buyer for Conversion Shares sold by the Company from authorized but unissued Conversion Shares, as such prices shall be determined in reasonable good faith by the Company's Board of Directors.

5. Covenants of the Company.

(a) Notices of Record Date. In the event of any taking by the Company of a record of the holders of any class of securities for the purpose of determining the holders thereof who are entitled to receive any dividend (other than a cash dividend which is the same as cash dividends paid in previous quarters or a stock dividend) or other distribution, the Company shall mail to the Holder, at least ten (10) days prior to such record date, a notice specifying the date on which any such record is to be taken for the purpose of such dividend or distribution.

(b) Covenants as to Exercise Shares. The Company covenants and agrees that all Conversion Shares that may be issued upon the exercise of the rights represented by this Warrant will, upon issuance in accordance with the terms hereof, be validly issued and outstanding, fully paid and nonassessable, and free from all taxes, liens and charges with respect to the issuance thereof. The Company further covenants and agrees that the Company will at all times during the Exercise Period have authorized and reserved, free from preemptive rights, a sufficient number of shares of its Preferred Stock to provide for the exercise of the rights represented by this Warrant. If at any time during the Exercise Period the number of authorized but unissued shares of Preferred Stock shall not be sufficient to permit exercise of this Warrant, the Company will take such corporate action as may, in the opinion of its counsel, be necessary to increase its authorized but unissued shares of Preferred Stock to such number of shares as shall be sufficient for such purposes.

6. Adjustment of Exercise Price and Number of Conversion Shares. The number and kind of Conversion Shares purchasable upon exercise of this Warrant and the Exercise Price shall be subject to adjustment from time to time as follows:

(a) Subdivisions, Combinations and Other Issuances. If the Company shall at any time after the issuance but prior to the expiration of this Warrant subdivide its Preferred Stock, by split-up or otherwise, or combine its Preferred Stock, or issue additional shares of its Preferred Stock or Common Stock as a dividend with respect to any shares of its Preferred Stock, the number of Conversion Shares issuable on the exercise of this Warrant shall forthwith be proportionately increased in the case of a subdivision or stock dividend, or proportionately decreased in the case of a combination. Appropriate adjustments shall also be made to the Exercise Price payable per share, but the aggregate Exercise Price payable for the total number of Conversion Shares purchasable under this Warrant (as adjusted) shall remain the same. Any adjustment under this Section 6(a) shall become effective at the close of business on the date the subdivision or combination becomes effective, or as of the record date of such dividend, or in the event that no record date is fixed, upon the making of such dividend.

(b) Reclassification, Reorganization and Consolidation. In case of any reclassification, capital reorganization or change in the capital stock of the Company (other than as a result of a subdivision, combination or stock dividend provided for in Section 6(a) above), then, as a condition of such reclassification, reorganization or change, lawful provision shall be made, and duly executed documents evidencing the same from the Company or its successor shall be delivered to the Holder, so that the Holder shall have the right at any time prior to the expiration of this Warrant to purchase, at a total price equal to that payable upon the exercise of this Warrant, the kind and amount of shares of stock and other securities or property receivable in connection with such reclassification, reorganization or change by a holder of the same number and type of securities as were purchasable as Conversion Shares by the Holder immediately prior to such reclassification, reorganization or change. In any such case appropriate provisions shall be made with respect to the rights and interest of the Holder so that the provisions hereof shall thereafter be applicable with respect to any shares of stock or other securities or property deliverable upon exercise hereof, and appropriate adjustments shall be made to the Exercise Price per Conversion Share payable hereunder, provided the aggregate Exercise Price shall remain the same.

(c) Corporate Transaction. In the event of a Corporate Transaction, pursuant to which the Holder would have been entitled to receive cash consideration per Conversion Share in an amount greater than the Exercise Price if the Holder had exercised its rights pursuant to this Warrant immediately prior thereto, the Company shall pay to the Holder, at the closing of such transaction, an amount equal to (i) the number of Conversion Shares issuable hereunder, multiplied by (ii) the difference of (A) the cash consideration per Conversion Share that the Holder would have received if it had exercised its rights pursuant to this Warrant immediately prior to the closing of such transaction, minus (B) the Exercise Price. This Warrant, and all rights of the Holder hereunder, shall automatically be terminated immediately upon delivery of such payment. If the Holder would have been entitled to receive cash consideration per Share in an amount equal to or less than the Exercise Price if the Holder had exercised its rights pursuant to this Warrant immediately prior to any such transaction, then this Warrant, and all rights of the Holder hereunder, shall automatically be terminated upon the closing of any such transaction.

(d) Adjustments for Diluting Issuances. Without duplication of any adjustment otherwise provided for in this Section 6, the number of shares of common stock issuable upon conversion of the Conversion Shares shall be subject to anti-dilution adjustment from time to time in the manner set forth in the Restated Certificate as if the Conversion Shares were issued and outstanding on and as of the date of any such required adjustment.

(e) Notice of Adjustment. When any adjustment is required to be made in the number or kind of shares purchasable upon exercise of the Warrant, or in the Exercise Price, the Company shall promptly notify the Holder of such event and of the number of Conversion Shares or other securities or property thereafter purchasable upon exercise of this Warrant.

(f) Conversion of Preferred Stock. In the event that all outstanding shares of Preferred Stock are converted to Common Stock, or any other security, in accordance with the terms of the Restated Certificate in connection with the IPO, a Corporate Transaction or other event, this Warrant shall become exercisable for Common Stock or such other security.

7. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant, but in lieu of such fractional shares the Company shall make a cash payment therefor on the basis of the Exercise Price then in effect.

8. No Stockholder Rights. Other than in respect of the adjustments provided in Section 6 hereof, prior to exercise of this Warrant, the Holder shall not be entitled to any rights of a stockholder with respect to the Conversion Shares, including (without limitation) the right to vote such Conversion Shares, receive dividends or other distributions thereon, exercise preemptive rights or be notified of stockholder meetings, and except as otherwise provided in this Warrant or the Purchase Agreement, such Holder shall not be entitled to any stockholder notice or other communication concerning the business or affairs of the Company.

9. Notice of Certain Events. If the Company proposes at any time to:

(a) declare any dividend or distribution upon the outstanding shares of the Company's capital stock, whether in cash, property, stock, or other securities and whether or not a regular cash dividend;

(b) effect any reclassification, exchange, combination, substitution, reorganization or recapitalization of the outstanding shares of the Company's capital stock;

(c) effect a Corporate Transaction or to liquidate, dissolve or wind up; or

(d) effect the IPO;

then, in connection with each such event, the Company shall give Holder:

(i) at least seven (7) business days prior written notice of the date on which a record will be taken for such dividend, distribution, or subscription rights (and specifying the date on which the holders of outstanding shares of the Company's capital stock will be entitled thereto) or for determining rights to vote, if any, in respect of the matters referred to in (a) above;

(ii) in the case of the matters referred to in (b) and (c) above at least seven (7) business days prior written notice of the date when the same will take place (and specifying the date on which the holders of outstanding shares of the Company's capital stock will be entitled to exchange their shares for the securities or other property deliverable upon the occurrence of such event and such reasonable information as Holder may reasonably require regarding the treatment of this Warrant in connection with such event giving rise to the notice); and

(iii) with respect to the IPO, at least seven (7) business days prior written notice of the date on which the Company proposes to file its registration statement in connection therewith.

Company will also provide information requested by Holder that is reasonably necessary to enable Holder to comply with Holder's accounting or reporting requirements.

10. Transfer of Warrant. Subject to compliance with applicable federal and state securities laws, this Warrant and all rights hereunder are transferable in whole or in part by the Holder to any person or entity upon written notice to the Company. Within a reasonable time after the Company's receipt of an executed Assignment Form in the form attached hereto, the transfer shall be recorded on the books of the Company upon the surrender of this Warrant, properly endorsed, to the Company at its principal offices, and the payment to the Company of all transfer taxes and other governmental charges imposed on such transfer. In the event of a partial transfer, the Company shall issue to the new holders one or more appropriate new warrants.

11. Successors and Assigns. The terms and provisions of this Warrant shall inure to the benefit of, and be binding upon, the Company and the holders hereof and their respective successors and assigns.

12. Titles and Subtitles. The titles and subtitles used in this Warrant are used for convenience only and are not to be considered in construing or interpreting this Warrant.

13. Amendments and Waivers; Resolution of Controversies; Notices. The amendment or waiver of any term of this Warrant, the resolution of any controversy or claim arising out of or relating to this Warrant and the provision of any notices under this Warrant shall be conducted pursuant to the terms of the Purchase Agreement.

14. Severability. If any provision of this Warrant is held to be unenforceable under applicable law, such provision shall be excluded from this Warrant and the balance of the Warrant shall be interpreted as if such provision were so excluded and shall be enforceable in accordance with its terms.

IN WITNESS WHEREOF, the parties have executed this Warrant as of the date first written above.

RAPID MICRO BIOSYSTEMS, INC.

By: /s/ Robert Spignesi
Robert Spignesi
President and Chief Executive Officer

IN WITNESS WHEREOF, the parties have executed this Warrant as of the date first written above.

[l]

By: _____
Name: _____
Title: _____

NOTICE OF EXERCISE

RAPID MICRO BIOSYSTEMS, INC.

Attention: Corporate Secretary

The undersigned hereby elects to purchase, pursuant to the provisions of the Warrant, as follows:

☐ _____ Conversion Shares pursuant to the terms of the attached Warrant, and tenders herewith payment in cash of the Exercise Price of such Conversion Shares in full, together with all applicable transfer taxes, if any.

☐ Net Exercise the attached Warrant with respect to _____ Conversion Shares.

The undersigned hereby represents and warrants that "Representations and Warranties" of the undersigned in Section 5 of the Purchase Agreement are true and correct as of the date hereof.

HOLDER:

Date: _____ By: _____

Address: _____

_____

Name in which shares should be registered:

_____

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: _____
(Please Print)

Address: _____
(Please Print)

Dated: _____

Holder's
Signature: _____

Holder's
Address: _____

NOTE: The signature to this Assignment Form must correspond with the name as it appears on the face of the Warrant. Officers of corporations and those acting in a fiduciary or other representative capacity should provide proper evidence of authority to assign the foregoing Warrant.

Exhibit 4.5

Execution Version

NEITHER THIS WARRANT NOR THE SECURITIES ISSUABLE UPON ITS EXERCISE HAVE BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "***ACT***"), OR ANY APPLICABLE STATE SECURITIES LAWS, AND MAY NOT BE OFFERED, SOLD OR OTHERWISE TRANSFERRED, PLEDGED OR HYPOTHECATED IN THE ABSENCE OF SUCH REGISTRATION OR AN EXEMPTION THEREFROM UNDER THE ACT AND APPLICABLE LAWS.

Warrant No. 2020-1

Number of Shares: 1,195,652
(subject to adjustment)

Date of Issuance: May 14, 2020

RAPID MICRO BIOSYSTEMS, INC.

PREFERRED STOCK PURCHASE WARRANT
(as amended and restated)

Rapid Micro Biosystems, Inc., a Delaware corporation (the "***Company***"), for value received, hereby certifies that Kennedy Lewis Capital Partners Master Fund II LP and its Affiliates (collectively, "***KLIM***") and/or any of their respective assigns (the "***Registered Holder***"), is entitled, subject to the terms and conditions set forth in this agreement (this "***Agreement***"), to purchase from the Company, in whole or in part, at any time and from time to time on or after the Date of Issuance and prior to the expiration hereof, 1,195,652 shares of Series C1 Preferred Stock, par value $0.01 per share, of the Company (the "***Preferred Stock***"), at an exercise price of $1.15 per share. The shares of Preferred Stock purchasable upon exercise of this warrant issued to the Registered Holder (this "***Warrant***") and the exercise price per share, each as adjusted from time to time pursuant to the provisions of this Warrant, are hereinafter referred to as the "***Warrant Shares***" and the "***Exercise Price***," respectively. "***Affiliates***" shall mean, as applied to any person, any other person who controls, is controlled by, or is under common control with, such person. For purposes of this definition, "***control***" means the possession, directly or indirectly through one or more intermediaries, of the power to direct the management and policies of a person, whether through the ownership of equity, by contract, or otherwise. "***Common Stock***" shall mean the Company's common stock, par value $0.01 and "***Convertible Common Stock***" shall mean the shares of Common Stock issuable upon the conversion of the Warrant Shares into shares of Common Stock on the terms set forth in the Seventh Amended and Restated Certificate of Incorporation of the Company (as amended, amended and restated, or otherwise modified from time to time, the "***Charter***"). The Company and KLIM acknowledge and agree that this Warrant amends and restates in its entirety and replaces that certain Preferred Stock Purchase Warrant originally issued by the Company to KLIM on May 14, 2020.

1. **Exercise**.

(a) This Warrant may be exercised, in whole or in part at any time and from time to time, by the Registered Holder by surrendering this Warrant, along with the purchase form appended hereto as Exhibit A duly executed and completed by the Registered Holder or by the Registered Holder's duly authorized representative, at the principal office of the Company, or at such other office or agency as the Company may designate by notice in writing to the Registered Holder, accompanied by either (i) cash or certified cashier's check payable to the Company (or wire transfer of immediately available funds), in lawful money of the United States, of the Exercise Price payable in respect of the number of Warrant Shares purchased upon such exercise (the "***Aggregate Exercise Price***"); or (ii) a written notice to the Company that the Registered Holder is exercising this Warrant on a "cashless" exercise basis by authorizing the Company to withhold from issuance a number of shares of Preferred Stock issuable upon such exercise of the Warrant which, when multiplied by the Fair Market Value of the Preferred Stock (or Common Stock, as applicable), is equal to the Aggregate Exercise Price (and such withheld shares shall no longer be issuable under this Warrant).

(b) Each exercise of this Warrant shall be deemed to have been effected immediately prior to the close of business on the day on which this Warrant shall have been surrendered to the Company as provided in Section 1(a) above (the "***Exercise Date***"), and the party entitled to receive the Preferred Stock issuable upon such exercise shall be treated for all purposes as the holder of record of such Preferred Stock (or, if the Registered Holder elects to immediately convert the Warrant Shares into shares of Convertible Common Stock, the holder of record of such shares of Convertible Common Stock) as of the close of business on such date.

(c) Within three (3) business days after the date of exercise of this Warrant, the Company, at its expense, will cause to be issued in the name of, and delivered to, the Registered Holder, or as such Registered Holder (upon payment by such Registered Holder of any applicable transfer taxes) may direct, a certificate or certificates for the number of full Warrant Shares to which the Registered Holder shall be entitled upon such exercise plus, in lieu of any fractional share to which the Registered Holder would otherwise be entitled, cash in an amount determined pursuant to Section 4 hereof; provided, however, that the Company shall not be required to pay any tax that may be payable in respect of any transfer involving the issuance and delivery of any such certificate upon exercise in a name other than that of the Registered Holder. Notwithstanding the foregoing, the Registered Holder shall be solely responsible for any income taxes payable and arising from the issuance or exercise of this Warrant, or any *ad valorem* property or intangible tax assessed against the Registered Holder.

(d) The Company shall assist and cooperate with any Registered Holder required to make any governmental filings or obtain any governmental approvals prior to or in connection with any exercise of this Warrant (including, without limitation, making any filings required to be made by the Company, which shall be at the Company's sole cost and expense).

(e) Notwithstanding any other provision of this Warrant, if the exercise of all or any portion of this Warrant is to be made in connection with an IPO (as defined below), Change of Control (as defined below), or any other transaction or event, such exercise may, at the election of the Registered Holder, be conditioned upon consummation of such transaction or event and in which case such exercise shall not be deemed effective until the consummation of such transaction or event.

2. **Adjustments**. The Exercise Price and number of Warrant Shares purchasable hereunder (and as a result the number of shares of the Convertible Common Stock issuable hereunder in lieu of Warrant Shares) shall be subject to adjustment from time to time as provided in this Section 2.

(a) Adjustment for Reclassification, Exchange and Substitution. If the Company shall at any time on or after the date on which this Warrant was first issued to the Registered Holder (the "***Original Issue Date***"), while this Warrant remains outstanding in whole or in part, by reclassification of securities or otherwise, change any of the securities as to which purchase rights under this Warrant exist into the same or a different number of securities of any other class or classes, this Warrant shall thereafter represent the right to acquire such number and kind of securities as would have been issuable as the result of such change with respect to the securities that were subject to the purchase rights under this Warrant immediately prior to such reclassification or other change, and the Exercise Price shall be appropriately adjusted, subject to further adjustment as provided in this Section 2. Any adjustment under this paragraph shall become effective at the close of business on the date the subdivision or combination becomes effective.

(b) Adjustment for Stock Splits and Combinations. If the Company shall at any time on or after the Original Issue Date, while this Warrant remains outstanding in whole or in part, (i) split, subdivide or combine the securities as to which purchase rights under this Warrant exist, into a different number of securities of the same class, or (ii) issue additional securities as a dividend with respect to any shares of its Preferred Stock, the number of shares of Preferred Stock subject hereto shall be proportionately adjusted and the Exercise Price, in the case of a split or subdivision, shall be proportionately decreased and, in the case of a combination or issuance of dividends, shall be proportionately increased, such that this Warrant shall represent the right to acquire the same number of shares of Preferred Stock (or, for the avoidance of doubt, if elected by the Registered Holder, the same number of shares of Convertible Common Stock) as would have been issuable immediately prior to such part, split, subdivision, combination, or issuance of dividends, without any increase in the amount of consideration paid therefor.

(c) Conversion Rate. Without duplication of any adjustment otherwise provided for in this Section 2, any events or circumstances that result in an adjustment to (i) the Series C1 Conversion Price (as defined in the Charter) of the Preferred Stock or (ii) the number of shares of Convertible Common Stock, in each case as provided for in Article Fourth, Part B, Section 4 of the Charter, shall be given effect upon the exercise of this Warrant as if the Warrant Shares were issued and outstanding on and as of the date of any such required adjustment.

(d) Conversion of Preferred Stock. In the event that all outstanding shares of Preferred Stock are converted to Common Stock, or any other security, in accordance with the terms of the Charter in connection with the Company's first underwritten public offering pursuant to an effective registration statement under the Act (an "***IPO***"), Change of Control, or other event, this Warrant shall automatically become exercisable for Common Stock or such other security.

(e) Certificates as to Adjustments.

(i) Upon the occurrence of each adjustment or readjustment of the Exercise Price and number of Warrant Shares pursuant to this Section 2, the Company at its expense shall promptly compute such adjustment or readjustment in accordance with the terms hereof and promptly furnish to the Registered Holder a certificate setting forth such adjustment or readjustment (including the kind and amount of securities, cash or other property for which this Warrant shall be exercisable and the Exercise Price) and showing in detail the facts upon which such adjustment or readjustment is based, and shall cause a copy of such certificate to be sent by electronic mail or mailed (by first-class mail, postage prepaid) to the Registered Holder in accordance with the notice provisions of Section 13 hereof.

(ii) The Company shall, upon the written request at any time of the Registered Holder, promptly furnish or cause to be furnished to the Registered Holder a certificate setting forth (A) the Exercise Price then in effect and (B) the number of shares of Preferred Stock, Convertible Common Stock and the amount, if any, of other securities, cash or property which then would be received upon the exercise of this Warrant and any rights under the Preferred Stock, and shall cause a copy of such certificate to be distributed to the Registered Holder.

3. **Treatment of Warrant Upon a Change of Control**. The Company shall give the Registered Holder written notice at least ten (10) business days prior to the closing of a Change of Control. In such event, notwithstanding any other provision of this Warrant to the contrary, the Company may terminate this Warrant in exchange for issuing to the Registered Holder substitute rights (which may be provided in the purchase or merger agreement governing the Change of Control or in a separate instrument) to receive the net economic benefits of this Warrant. Such net economic benefits shall be determined by deducting the aggregate exercise price of this Warrant from the aggregate proceeds which would be payable on account of the Warrant Shares (or, if elected by the Registered Holder, the Convertible Common Stock), including any post-closing payments or adjustments to the consideration received by the Company or its stockholders, as if this Warrant and/or any of the rights under the Preferred Stock had been fully exercised by the Registered Holder immediately before the Change of Control (but without requiring such exercise). Such substitute rights shall provide the Registered Holder the right to receive such net economic benefits when and as the correlative proceeds in excess of the aggregate exercise price would become payable on account of the Warrant Shares (or, if elected by the Registered Holder, the Convertible Common Stock). For the avoidance of doubt (i) to the extent the consideration to be provided in the Change of Control is a security that is not listed on a national securities exchange, the Registered Holder shall be entitled to elect to receive either (1) cash in an amount equal to the Fair Market Value of the net economic benefits of this Warrant or (2) an amount of such securities having deal value equal to the net economic benefit of this Warrant and (ii) at any time prior to the Change of Control, the Registered Holder may exercise this Warrant in accordance with the terms hereof, in which case such Registered Holder shall be entitled to receive any consideration to be received by holders of Preferred Stock (or Convertible Common Stock if elected by the Registered Holder).

4. **Fractional Shares**. The Company shall not be required upon the exercise of this Warrant to issue any fractional shares, but shall make an adjustment therefor in cash on the basis of the fair market value ("***Fair Market Value***") per share of Preferred Stock (or Common Stock, as applicable), such Fair Market Value to be determined as follows:

(a) If traded on a national securities exchange or through the Nasdaq Capital Market, the Fair Market Value shall be deemed to be the average of the closing prices of the securities on such exchanges over the thirty (30) day period ending three (3) days prior to the closing. If actively traded over the counter, the value shall be deemed to be the average of the closing bid or sales prices (whichever is applicable) over the thirty (30) day period ending three (3) days prior to the closing;

(b) In the event that this Warrant is exercised in connection with the IPO, the Fair Market Value shall be the per share offering price to the public of the IPO; or

(c) If at any time such security is not listed on any national securities exchange or the Nasdaq Capital Market or quoted in the over-the-counter markets, and this Warrant is not being exercised in connection with the IPO, the Fair Market Value shall be the fair value thereof, as determined jointly and in good faith by the Company's Board of Directors and the Registered Holder of the Warrants then remaining outstanding. If such parties are unable to reach agreement on such fair value within a reasonable period of time, such fair value shall be determined by an independent appraiser experienced in valuing securities jointly and in good faith selected by the Company's Board of Directors and the Registered Holder of the Warrants then remaining outstanding. The determination of the appraiser shall be final and binding upon the parties and the Company shall pay the fees and expenses of such appraiser.

5. **Requirements for Transfer**.

(a) This Warrant and the Warrant Shares shall not be sold or transferred unless either (i) they first shall have been registered under the Act or (ii) such sale or transfer is exempt from the registration requirements of the Act. A transferring Registered Holder will cause any proposed transferee of this Warrant to agree to take and hold this Warrant subject to the provisions of and upon the conditions specified in this Warrant.

(b) Each certificate representing Warrant Shares shall bear a legend substantially in the following form:

"THE SECURITIES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED, AND MAY NOT BE OFFERED, SOLD OR OTHERWISE TRANSFERRED, PLEDGED OR HYPOTHECATED UNLESS AND UNTIL SUCH SECURITIES ARE REGISTERED UNDER SUCH ACT OR UNLESS SOLD PURSUANT TO AN EXEMPTION THEREFROM, OR EXCEPTION THERETO, AND IN ACCORDANCE WITH APPLICABLE SECURITIES LAWS."

The foregoing legend shall be removed from the certificates representing any Warrant Shares, at the request of the holder thereof, at such time as all of the applicable conditions of Rule 144 (then in effect) are met (other than the information requirements thereof, which shall be the responsibility of the Company to maintain and make available to prospective investors).

6. **No Impairment**. The Company will not, by amendment of the Charter or through reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such action as may be necessary or appropriate in order to protect the rights of the Registered Holder against impairment. Without limiting the generality of the foregoing, the Company will (a) not increase the par value of any shares of Preferred Stock or Convertible Common Stock obtainable upon the exercise of this Warrant or any of the rights under the Preferred Stock and (b) take all such actions as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable shares of Preferred Stock upon the exercise of this Warrant and Convertible Common Stock upon the exercise of any rights under the Preferred Stock.

7. **Notices of Record Date, etc**. In the event:

(a) the Company shall propose at any time to (i) declare any dividend or other distribution upon the outstanding shares of Preferred Stock (or other stock or securities at the time deliverable upon the exercise of this Warrant) or (ii) grant to the holders of Preferred Stock (or other stock or securities at the time deliverable upon the exercise of this Warrant) any right to subscribe for or purchase any shares of stock of any class or any other securities (other than pursuant to contractual right held by such holders), or to receive any other right; or

(b) any sale, license, or other disposition of all or substantially all of the Company's assets (including intellectual property) (a "***Sale***"), or any reorganization, consolidation, merger, sale of the voting securities of the Company or other transaction or series of related transactions where the holders of the Company's securities before the transaction or series of related transactions beneficially own less than forty-nine percent (49%) of the outstanding voting securities of, or economic interests in, the surviving entity after the transaction or series of related transactions (an "***Acquisition***" and together with a Sale, a "***Change of Control***");

(c) the Company proposes to file a registration statement in connection with an IPO;

(d) of any capital reorganization of the Company or any reclassification of the Company's capital stock; or

(e) of the voluntary or involuntary dissolution, liquidation or winding-up of the Company,

then, and in each such case, the Company will mail or cause to be distributed to the Registered Holder at least seven (7) days prior to the record date specified therein (or such shorter period approved by the Registered Holder) and at least seven (7) days prior to the effective date of such event specified in clause (b) or (c) hereof a notice specifying, as the case may be, (i) the record date for such dividend, distribution or right, and the amount and character of such dividend, distribution or right, or (ii) the effective date on which such Change of Control, dissolution, liquidation or winding-up is to take place, and the time, if any is to be fixed, as of which the holders of record of Preferred Stock (or such other stock or securities at the time deliverable upon the exercise of this Warrant) shall be entitled to exchange their shares of Preferred Stock (or such other stock or securities) for securities or other property deliverable upon such Change of Control, dissolution, liquidation or winding-up. Nothing herein shall prohibit the Registered Holder from exercising this Warrant during the seven (7) day period commencing on the date of such notice.

8. **Reservation of Stock**. The Company covenants that, for as long as this Warrant remains outstanding, the Company will at all times (a) reserve and keep available, from its authorized and unissued Preferred Stock solely for issuance and delivery upon the exercise of this Warrant and free of preemptive rights, such number of Warrant Shares and other securities, cash and/or property, as from time to time shall be issuable upon the exercise of this Warrant, (b) from time to time, take all steps necessary to increase the authorized number of shares of its Preferred Stock if at any time the authorized number of shares of Preferred Stock remaining unissued is insufficient to permit the exercise of this Warrant, (c) reserve from its authorized and unissued shares of Common Stock a sufficient number of shares of Common Stock to provide for the Convertible Common Stock and (iv) take all steps necessary to increase the number of shares of Common Stock to provide sufficient reserves of shares of Convertible Common Stock.

9. **Issuance Upon Exercise**. All shares of Preferred Stock and Convertible Common Stock issuable upon exercise of this Warrant or any rights under the Preferred Stock, as applicable, will be duly and validly issued, fully paid and nonassessable and will be free of restrictions on transfer, other than restrictions on transfer under any agreement between the Registered Holder and the Company and under applicable state and federal securities laws, and will be free from all taxes, liens and charges in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously or otherwise specified herein). The Company shall take all such actions as may be necessary to ensure that all such shares of Preferred Stock and Convertible Common Stock may be so issued without violation of any applicable law or governmental regulation or any requirements of any domestic stock exchange upon which shares of Preferred Stock or Convertible Common Stock may be listed (except for official notice of issuance which shall be immediately delivered by the Company upon each such issuance).

10. **Exchange of Warrants**. Upon the surrender by the Registered Holder to the Company, the Company will, subject to the provisions of Section 5 hereof, issue and deliver to or upon the order of such Registered Holder, at the Company's expense, a new Warrant or Warrants of like tenor, in the name of the Registered Holder or as the Registered Holder may direct (in which case such transferee shall become a Registered Holder), calling in the aggregate on the face or faces thereof for the number of shares of Preferred Stock (or other securities, cash and/or property) then issuable upon exercise of this Warrant, in each case as the Registered Holder may direct.

11. **Replacement of Warrants**. Upon receipt of evidence reasonably satisfactory to the Company (an affidavit of a Registered Holder shall be satisfactory) of the ownership and loss, theft, destruction or mutilation of any certificate evidencing this Warrant and in the case of loss, theft or destruction, upon delivery of an unsecured indemnity agreement of the Registered Holder, or in the case of mutilation, upon surrender and cancellation of such certificate, the Company shall, at its expense, execute and deliver in lieu of such certificate, a new certificate of like kind representing the same rights represented by such lost, stolen, destroyed or mutilated certificate and dated the date of such lost, stolen, destroyed or mutilated certificate.

12. **Transfers, etc.**

(a) The Company shall keep and properly maintain a register (the "***Warrant Register***") at its principal executive office containing the name and address of the Registered Holder of this Warrant. The Registered Holder may change its or his address as shown on the warrant register by written notice to the Company requesting such change.

(b) Subject to the provisions of Section 5 hereof, this Warrant and all rights hereunder are transferable, in whole or in part, upon surrender of this Warrant with a properly executed assignment (in the form of Exhibit B hereto) at the principal executive office of the Company.

(c) Until any transfer of this Warrant is made in the Warrant Register, the Company may treat the Registered Holder as the absolute owner hereof for all purposes; provided, however, that if and when this Warrant is properly assigned in blank, the Company may (but shall not be obligated to) treat the bearer hereof as the absolute owner hereof for all purposes, notwithstanding any notice to the contrary.

(d) The Company shall not close its books against the transfer of this Warrant or any share of Preferred Stock issued or issuable upon the exercise of this Warrant in any manner which interferes with the timely exercise of this Warrant. The Company shall from time to time take all such action as may be necessary to ensure that the par value per share of the unissued Preferred Stock acquirable upon exercisable of this Warrant is at all times equal to or less than the Exercise Price then in effect.

13. **Distributing of Notices, etc**. Any notice, request, demand or other communication required or permitted to be given to a party pursuant to the provisions of this Agreement will be in writing and will be effective and deemed given under this Agreement on the earliest of: (a) the date of personal delivery, (b) the date of transmission by electronic mail and (c) two (2) days after deposit with a nationally-recognized courier or overnight service such as Federal Express, and shall in all cases be accompanied by an electronic mail notice. All notices not delivered personally, by facsimile or by electronic mail will be sent with postage and other charges prepaid and properly addressed to the party to be notified at the address set forth for such party:

If to a Registered Holder:

KENNEDY LEWIS CAPITAL PARTNERS MASTER FUND II LP
80 Broad Street
22nd Floor
New York, NY 10004
Attention: Richard Gumer
Email: [XXX]

With a copy to (which does not constitute notice):

Akin Gump Strauss Hauer & Feld LLP
One Bryant Park
Bank of America Tower
New York, NY 10036-6745
Phone: 212-872-1000
Attn: Daniel Fisher
Email: [XXX]

If to the Company:

RAPID MICRO BIOSYSTEMS, INC.
1001 Pawtucket Blvd. West
Lowell, MA 01854
Attn: Chief Financial Officer
Email: [XXX]

With a copy to (which does not constitute notice):

Latham & Watkins LLP
200 Clarendon Street, 27th Floor
Boston, MA 02116
Phone: 617-948-6083
Attn: Stephen W. Ranere
Email: [XXX]

Any party hereto (and such party's permitted assigns) may change such party's address for receipt of future notices hereunder by giving written notice to the Company and the other parties hereto.

14. **No Rights or Liabilities as Stockholder; Lock-Up Agreement.**

(a) Other than as otherwise provided in this Warrant, prior to exercise of this Warrant, the Registered Holder shall not be entitled to any rights of a stockholder with respect to the Warrant Shares, including (without limitation) the right to vote such shares, receive dividends or other distributions thereon, exercise preemptive rights, be notified of stockholder meetings, or be entitled to any stockholder notice or other communication concerning the business or affairs of the Company.

(b) In the event (i) (x) the Company effects a split of the Common Stock or Preferred Stock by means of a stock dividend and (y) the Exercise Price of the Warrants and the number of any of the securities as to which purchase rights under this Warrant exist are adjusted as of the date of the distribution of the dividend (rather than as of the record date for such dividend), and (ii) the Registered Holder exercises this Warrant between the record date and the distribution date for such stock dividend, then the Registered Holder shall be entitled to receive, on the distribution date, the stock dividend with respect to any shares of the securities as to which purchase rights under this Warrant or the Preferred stock, as applicable, exist and are or could be acquired upon the exercise of this Warrant and the exercise of any rights under the Preferred Stock, as applicable, notwithstanding the fact that such shares were not outstanding as of the close of business on the record date for such stock dividend.

(c) The Registered Holder hereby agrees that it will not, without the prior written consent of the managing underwriter, during the period commencing on the date of the final prospectus relating to the IPO, and ending on the date specified by the Company and the managing underwriter (such period not to exceed one hundred eighty (180) days, which period may be extended upon the request of the managing underwriter, but only to the extent required by any FINRA rules, for an additional period of up to thirty-four (34) days if the Company issues or proposes to issue an earnings or other public release within thirty-four (34) days of the expiration of the 180-day lockup period), (i) lend; offer; pledge; sell; contract to sell; sell any option or contract to purchase; purchase any option or contract to sell; grant any option, right, or warrant to purchase; or otherwise transfer or dispose of, directly or indirectly, any shares of Common Stock or any securities convertible into or exercisable or exchangeable (directly or indirectly) for Common Stock held immediately before the effective date of the registration statement for such offering or (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of such securities, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Common Stock or other securities, in cash, or otherwise. The foregoing provisions of this Section 14(c) shall apply only to the IPO, shall not apply to the sale of any shares to an underwriter pursuant to an underwriting agreement, and shall be applicable to the Registered Holder only if all officers, directors and stockholders who individually own more than one percent (1%) of the Company's outstanding Common Stock (after giving effect to conversion into Common Stock of all outstanding shares of the Company's preferred stock) are subject to the same restrictions. Any discretionary waiver or termination of the restrictions of any or all of such agreements by the Company or the underwriters shall apply pro rata to the Registered Holder, based on the number of shares subject to such agreements. The underwriters in connection with such registration are intended third-party beneficiaries of this Section 14(c) and shall have the right, power, and authority to enforce the provisions hereof as though they were a party hereto. The Registered Holder further agrees to execute such agreements as may be reasonably requested by the underwriters in connection with such registration that are consistent with this Section 14(c) or that are necessary to give further effect thereto.

15. **Amendment or Waiver; Expiration**. Any term of this Warrant may be amended or waived upon the written consent of the Company, on the one hand, and KLIM, on the other hand. Unless earlier exercised in full or terminated in accordance with the terms hereof, this Warrant shall automatically expire and be of no further force or effect on the tenth anniversary of the Date of Issuance.

16. **Successors and Assigns**. This Warrant shall be binding upon and inure to the benefit of the Registered Holder and its assigns, and shall be binding upon any entity succeeding to the Company by consolidation, merger or acquisition of all or substantially all of the Company's assets. The Company may not assign this Warrant or any rights or obligations hereunder without the prior written consent of the Registered Holder. The Registered Holder may assign this Warrant without the Company's prior written consent.

17. **Remedies**. In the event of a breach by either party of any of its obligations under this Warrant, the non-breaching party, in addition to being entitled to exercise all rights granted by law, including recovery of damages, will be entitled to specific performance of its rights under this Warrant. Each party agrees that monetary damages would not provide adequate compensation for any losses incurred by reason of its breach of any of the provisions of this Warrant and hereby further agrees that, in the event of any action for specific performance in respect of such breach, it shall waive the defense that a remedy at law would be adequate.

18. **Section Headings**. The section headings in this Warrant are for the convenience of the parties and in no way alter, modify, amend, limit or restrict the contractual obligations of the parties.

19. **Counterparts**. This Warrant may be executed and delivered by facsimile or portable document format (.pdf) and may be executed in counterparts, each of which will be deemed an original but all of which together will constitute one and the same instrument.

20. **Severability**. The provisions of this Warrant will be deemed severable and the invalidity or unenforceability of any provision hereof will not affect the validity or enforceability of the other provisions hereof; provided that if any provision of this Warrant, as applied to any party or to any circumstance, is adjudged by a court, governmental body, arbitrator, or mediator not to be enforceable in accordance with its terms, the parties agree that the court, governmental body, arbitrator, or mediator making such determination will have the power to modify the provision in a manner consistent with its objectives such that it is enforceable, and/or to delete specific words or phrases, and in its reduced form, such provision will then be enforceable and will be enforced.

21. **Titles and Subtitles**. The article and section headings contained in this Warrant are inserted for convenience only and will not affect in any way the meaning or interpretation of this Warrant.

22. **Third Parties**. Nothing in this Warrant, express or implied, is intended to confer upon any person other than the parties hereto and their successors and assigns, any rights or remedies under or by reason of this Warrant.

23. **Governing Law and Jurisdiction**. This Warrant and the performance of the transactions and the obligations of the parties hereunder will be governed by and construed and enforced in accordance with the laws of the State of Delaware, without giving effect to any choice of law or conflict of law principles.

24. **Representations and Warranties of the Company.** The Company hereby represents and warrants to the Registered Holder that (i) it has the corporate power and authority to execute this Agreement and consummate the transactions contemplated by this Agreement, (ii) there are no statutory or contractual stockholders' preemptive rights or rights of refusal with respect to the issuance of any Warrants that have not been satisfied or waived and (iii) the execution and delivery by the Company of this Agreement and the issuance of the shares of Preferred Stock upon exercise of any Warrant and the Convertible Common Stock do not and shall not (A) conflict with or result in a breach of the terms, conditions or provisions of, (B) constitute a default under, (C) result in the creation of any lien, security interest, charge or encumbrance upon the Company's capital stock or assets pursuant to, (D) result in a violation of, or (E) require any authorization, consent, approval, exemption or other action by or notice or declaration to, or filing with, any court or administrative or governmental body or agency pursuant to, the Company's governing documents or any law in effect as of the date hereof to which the Company is subject, or any agreement, instrument, order, judgment or decree to which the Company is subject as of the date hereof, except for any such authorization, consent, approval, notice or exemption required under applicable securities laws.

25. **Representations and Warranties of the Holder.** The Registered Holder represents and warrants to the Company as follows:

(a) This Warrant and the Warrant Shares to be acquired upon exercise of this Warrant by the Registered Holder will be acquired for investment for the Registered Holder's account, not as a nominee or agent, and not with a view to the public resale or distribution within the meaning of the Act.

(b) The Registered Holder has received or has had full access to all the information it considers necessary or appropriate to make an informed investment decision with respect to the acquisition of this Warrant and its underlying securities. The Registered Holder further has had an opportunity to ask questions and receive answers from the Company regarding the terms and conditions of the offering of this Warrant and its underlying securities and to obtain additional information (to the extent the Company possessed such information or could acquire it without unreasonable effort or expense) necessary to verify any information furnished to the Registered Holder or to which the Registered Holder has access.

(c) The Registered Holder understands that the acquisition of this Warrant and its underlying securities involves substantial risk. The Registered Holder has experience as an investor in securities of companies of a similar size and stage of development as the Company and acknowledges that the Registered Holder can bear the economic risk of such Registered Holder's investment in this Warrant and its underlying securities and has such knowledge and experience in financial or business matters that the Registered Holder is capable of evaluating the merits and risks of its investment in this Warrant and its underlying securities and/or has a preexisting personal or business relationship with the Company and certain of its officers, directors or controlling persons of a nature and duration that enables the Registered Holder to be aware of the character, business acumen and financial circumstances of such persons.

(d) The Registered Holder is an "accredited investor" as such term is defined under Rule 501 of Regulation D promulgated under the Act.

(e) The Registered Holder understands that this Warrant and the Warrant Shares issuable upon exercise hereof have not been registered under the Act in reliance upon a specific exemption therefrom, which exemption depends upon, among other things, the bona fide nature of the Registered Holder's investment intent as expressed herein. The Registered Holder understands that this Warrant and the Warrant Shares issued upon any exercise hereof must be held indefinitely unless subsequently registered under the Act and qualified under applicable state securities laws, or unless exemption from such registration and qualification are otherwise available.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have executed this Warrant as of the Date of Issuance.

/s/ Robert Spignesi
Name:Robert Spignesi
Title: President and Chief Executive Officer

[*Signature Page to Series C1 Warrant Agreement*]

IN WITNESS WHEREOF, the parties have executed this Warrant as of the Date of Issuance.

REGISTERED HOLDER: KENNEDY LEWIS CAPITAL PARTNERS MASTER FUND II LP

By: KENNEDY LEWIS GP II, LLC, its general partner

By: /s/ Anthony Pasqua
Name: Anthony Pasqua
Title: Authorized Signatory

[*Signature Page to Series C1 Warrant Agreement*]

EXHIBIT A

PURCHASE FORM

To: _____ Dated: _____

The undersigned, pursuant to the provisions set forth in the attached Warrant (No. ___), hereby irrevocably elects to purchase _____ shares of the Preferred Stock covered by such Warrant.

The undersigned herewith makes payment of the full exercise price for such shares at the price per share provided for in such Warrant.

By its execution below and for the benefit of the Company, the undersigned hereby restates each of the representations and warranties in Section 25 of such Warrant as of the date hereof.

[_____]

_____

Name:
Title:

Address: _____

_____

EXHIBIT B

ASSIGNMENT FORM

FOR VALUE RECEIVED, _____ hereby sells, assigns and transfers all of the rights of the undersigned under the attached Warrant (No. ____) with respect to the number of shares of Preferred Stock covered thereby set forth below, unto:

Name of Assignee	Address	No. of Shares

Dated: _____

[_____]

_____

Name:

Title:

Exhibit 10.1

RAPID MICRO BIOSYSTEMS, INC.

2010 STOCK OPTION AND GRANT PLAN

(as amended and restated April 28, 2020)

SECTION 1. GENERAL PURPOSE OF THE PLAN; DEFINITIONS

The name of the plan is the Rapid Micro Biosystems, Inc. 2010 Stock Option and Grant Plan (as amended and restated, the "Plan"). The purpose of the Plan is to encourage and enable the officers, employees, directors, Consultants and other key persons (including prospective employees, but conditioned on their employment) of Rapid Micro Biosystems, Inc., a Delaware corporation (including any successor entity, the "Company") and any Subsidiary, upon whose judgment, initiative and efforts the Company largely depends for the successful conduct of its business, to acquire a proprietary interest in the Company. It is anticipated that providing such persons with a direct stake in the Company's welfare will assure a closer identification of their interests with those of the Company and its stockholders, thereby stimulating their efforts on the Company's behalf and strengthening their desire to remain with the Company.

The following terms shall be defined as set forth below:

"*Affiliate*" of any Person means a Person that directly or indirectly, through one or more intermediaries, controls, is controlled by or is under common control with the first mentioned Person. A Person shall be deemed to control another Person if such first Person possesses directly or indirectly the power to direct, or cause the direction of, the management and policies of the second Person, whether through the ownership of voting securities, by contract or otherwise.

"*Award*" or "*Awards*," except where referring to a particular category of grant under the Plan, shall include Incentive Stock Options, Non-Qualified Stock Options, Restricted Stock Awards, Unrestricted Stock Awards, Restricted Stock Units or any combination of the foregoing.

"Award Agreement" means a written or electronic agreement setting forth the terms and provisions applicable to an Award granted under the Plan. Each Award Agreement may contain terms and conditions in addition to those set forth in the Plan; *provided*, *however*, that except to the extent explicitly provided to the contrary, in the event of any conflict in the terms of the Plan and the Award Agreement, the terms of the Plan shall govern**.**

"*Bankruptcy*" shall mean (i) the filing of a voluntary petition under any bankruptcy or insolvency law, or a petition for the appointment of a receiver or the making of an assignment for the benefit of creditors, with respect to the Holder, or (ii) the Holder being subjected involuntarily to such a petition or assignment or to an attachment or other legal or equitable interest with respect to the Holder' s assets, which involuntary petition or assignment or attachment is not discharged within 60 days after its date, and (iii) the Holder being subject to a transfer of its Issued Shares or Award(s) by operation of law (including by divorce, even if not insolvent), except by reason of death.

"*Board*" means the Board of Directors of the Company.

"*Cause*" shall have the meaning as set forth in the Award Agreement(s). In the case that any Award Agreement does not contain a definition of "Cause," it shall mean (i) dishonest statements or acts of the grantee with respect to the Company or any Affiliate of the Company, or any of the Company's current or prospective customers, suppliers vendors or other third parties with which such entity does business; (ii) the grantee's commission of (A) a felony or (B) any misdemeanor involving moral turpitude, deceit, dishonesty or fraud; (iii) failure to perform to the reasonable satisfaction of the Company the grantee's duties and responsibilities assigned or delegated which failure continues, in the reasonable judgment of the Company, after written notice given to the grantee by the Company; (iv) gross negligence, willful misconduct or insubordination of the grantee with respect to the Company or any Affiliate of the Company; or (v) a violation of any provision of any agreement(s) between grantee and the Company relating to noncompetition, nondisclosure and/or assignment of inventions.

"Chief Executive Officer" means the Chief Executive Officer of the Company or, if there is no Chief Executive Officer, then the President of the Company.

"*Code*" means the Internal Revenue Code of 1986, as amended, and any successor Code, and related rules, regulations and interpretations.

"*Committee*" means the Committee of the Board referred to in Section 2.

"Consultant" means any natural person that provides bona fide services to the Company (including a Subsidiary), and such services are not in connection with the offer or sale of securities in a capital-raising transaction and do not directly or indirectly promote or maintain a market for the Company's securities.

"*Effective Date*" means the date on which the Plan is approved by stockholders as set forth on the final page of the Plan.

"*Exchange Act*" means the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder.

"*Fair Market Value*" of the Stock on any given date means the fair market value of the Stock determined in good faith by the Committee based on the reasonable application of a reasonable valuation method not inconsistent with Section 409A of the Code. If the Stock is admitted to quotation on a national securities exchange, the determination shall be made by reference to market quotations. If the date for which Fair Market Value is determined is the first day when trading prices for the Stock are reported on a national securities exchange, the Fair Market Value shall be the "Price to the Public" (or equivalent) set forth on the cover page for the final prospectus relating to the Company's Initial Public Offering.

"Good Reason" shall have the meaning as set forth in the Award Agreement(s). In the case that any Award Agreement does not contain a definition of "Good Reason," it shall mean: (i) a material diminution in the grantee's base salary except for across-the-board salary reductions based on the Company's financial performance similarly affecting all or substantially all senior management employees of the Company or (ii) a change of more than 50 miles in the geographic location at which the grantee provides services to the Company.

"*Grant Date*" means the date that the Committee designates in its approval of an Award in accordance with applicable law as the date on which the Award is granted, which date may not precede the date of such Committee approval.

"*Holder*" means, with respect to an Award or any Issued Shares, the Person holding such Award or Issued Shares, including the initial recipient of the Award or any Permitted Transferee.

"*Incentive Stock Option*" means any Stock Option designated and qualified as an "incentive stock option" as defined in Section 422 of the Code.

"*Initial Public Offering*" means the consummation of the first fully underwritten, firm commitment public offering pursuant to an effective registration statement under the Securities Act covering the offer and sale by the Company of its equity securities, as a result of or following which the Stock shall be publicly held.

"*Issued Shares*" means, collectively, all outstanding Shares issued pursuant to Restricted Stock Awards, Unrestricted Stock Awards and Restricted Stock Units and all Option Shares.

"*NASDAQ*" means the NASDAQ Stock Market LLC.

"*Non-Qualified Stock Option*" means any Stock Option that is not an Incentive Stock Option.

"*Option*" or "*Stock Option*" means any option to purchase shares of Stock granted pursuant to Section 5.

"*Option Shares*" means outstanding shares of Stock that were issued to a Holder upon the exercise of a Stock Option.

"*Permitted Transferees*" shall mean any of the following to whom a Holder may transfer Issued Shares hereunder (as set forth in Section 9(a)(ii)(A)): the Holder's child, stepchild, grandchild, parent, stepparent, grandparent, spouse, former spouse, sibling, niece, nephew, mother-in-law, father-in-law, son-in-law, daughter-in-law, brother-in-law, or sister-in-law, including adoptive relationships, any person sharing the Holder's household (other than a tenant or employee), a trust in which these persons have more than fifty percent of the beneficial interest, a foundation in which these persons control the management of assets, and any other entity in which these persons own more than fifty percent of the voting interests*; provided*, *however,* that any such trust does not require or permit distribution of any Issued Shares during the term of the Award Agreement unless subject to its terms. Upon the death of the Holder, the term Permitted Transferees shall also include such deceased Holder's estate, executions, administrations, personal representations, heirs, legatees and distributees, as the case may be.

"*Person*" shall mean any individual, corporation, partnership (limited or general), limited liability company, limited liability partnership, association, trust, joint venture, unincorporated organization or any similar entity.

"*Repurchase Event*" means (i) a Sale Event or (ii) the Holder's Bankruptcy.

"*Restricted Stock Award*" means Awards granted pursuant to Section 6 and "*Restricted Stock*" means Shares granted pursuant to such Awards.

"*Restricted Stock Unit*" means an Award of phantom stock units to a grantee, which may be settled in cash or stock as determined by the Committee, pursuant to Section 8.

"*Sale Event*" means the consummation of (i) the dissolution or liquidation of the Company, (ii) the sale of all or substantially all of the assets of the Company on a consolidated basis to an unrelated person or entity, (iii) a merger, reorganization or consolidation involving the Company in which the shares of voting stock outstanding immediately prior to such transaction represent or are converted into or exchanged for securities of the surviving or resulting entity immediately upon completion of such transaction which represent less than 50 percent of the outstanding voting power of such surviving or resulting entity, (iv) the acquisition of all or a majority of the outstanding voting stock of the Company in a single transaction or a series of related transactions by a Person or group of Persons, or (v) any other acquisition of the business of the Company, as determined by the Board; *provided*, *however*, that the Company's Initial Public Offering, any subsequent public offering or another capital raising event, or a merger effected solely to change the Company's domicile shall not constitute a "Sale Event."

"*Section 409A*" means Section 409A of the Code and the regulations and other guidance promulgated thereunder.

"*Securities Act*" means the Securities Act of 1933, as amended, and the rules and regulations thereunder.

"*Service Relationship*" means any relationship as a full-time employee, part-time employee, director or other key person (including Consultants) of the Company or any Subsidiary or any successor entity (e.g., a Service Relationship shall be deemed to continue without interruption in the event an individual's status changes from full-time employee to part-time employee or Consultant).

"*Shares*" means shares of Stock.

"*Stock*" means the Common Stock, par value $.01 per share, of the Company, subject to adjustments pursuant to Section 3.

"*Subsidiary*" means any corporation or other entity (other than the Company) in which the Company has more than a 50 percent interest, either directly or indirectly.

"*Ten Percent Owner*" means an employee who owns or is deemed to own (by reason of the attribution rules of Section 424(d) of the Code) more than 10 percent of the combined voting power of all classes of stock of the Company or any parent of the Company or any Subsidiary.

"*Termination Event*" means the termination of the Award recipient's Service Relationship with the Company and its Subsidiaries for any reason whatsoever, regardless of the circumstances thereof, and including, without limitation, upon death, disability, retirement, discharge or resignation for any reason, whether voluntarily or involuntarily. The following shall not constitute a Termination Event: (i) a transfer to the service of the Company from a Subsidiary or from the Company to a Subsidiary, or from one Subsidiary to another Subsidiary or (ii) an approved leave of absence for military service or sickness, or for any other purpose approved by the Committee, if the individual's right to re-employment is guaranteed either by a statute or by contract or under the policy pursuant to which the leave of absence was granted or if the Committee otherwise so provides in writing.

"*Unrestricted Stock Award*" means any Award granted pursuant to Section 7 and "*Unrestricted Stock*" means Shares granted pursuant to such Awards.

SECTION 2. ADMINISTRATION OF PLAN; COMMITTEE AUTHORITY TO SELECT GRANTEES AND DETERMINE AWARDS

(a) Administration of Plan. The Plan shall be administered by the Board, or at the discretion of the Board, by a committee of the Board, comprised, except as contemplated by Section 2(c), of not less than two Directors. All references herein to the "Committee" shall be deemed to refer to the group then responsible for administration of the Plan at the relevant time (i.e., either the Board of Directors or a committee or committees of the Board, as applicable).

(b) Powers of Committee. The Committee shall have the power and authority to grant Awards consistent with the terms of the Plan, including the power and authority:

(i) to select the individuals to whom Awards may from time to time be granted;

(ii) to determine the time or times of grant, and the amount, if any, of Incentive Stock Options, Non-Qualified Stock Options, Restricted Stock Awards, Unrestricted Stock Awards, Restricted Stock Units, or any combination of the foregoing, granted to any one or more grantees;

(iii) to determine the number of shares of Stock to be covered by any Award and, subject to the provisions of Section 5(a)(i) below, the price, exercise price, conversion ratio or other price relating thereto;

(iv) to determine and, subject to Section 13, to modify from time to time the terms and conditions, including restrictions, not inconsistent with the terms of the Plan, of any Award, which terms and conditions may differ among individual Awards and grantees, and to approve the form of Award Agreements;

(v) to accelerate at any time the exercisability or vesting of all or any portion of any Award;

(vi) to impose any limitations on Awards granted under the Plan, including limitations on transfers, repurchase provisions and the like, and to exercise repurchase rights or obligations;

(vii) subject to any restrictions imposed by Section 409A, to extend at any time the period in which Stock Options may be exercised; and

(viii) at any time to adopt, alter and repeal such rules, guidelines and practices for administration of the Plan and for its own acts and proceedings as it shall deem advisable; to interpret the terms and provisions of the Plan and any Award (including related written instruments); to make all determinations it deems advisable for the administration of the Plan; to decide all disputes arising in connection with the Plan; and to otherwise supervise the administration of the Plan.

All decisions and interpretations of the Committee shall be binding on all persons, including the Company and Plan grantees.

(c) Award Agreement. Awards under the Plan shall be evidenced by Award Agreements that set forth the terms, conditions and limitations for each Award and may include, without limitation, the term of an Award, the provisions applicable in the event the Service Relationship terminates, and the Company's authority to unilaterally or bilaterally amend, modify, suspend, cancel or rescind an Award. To the extent permitted by the Committee, Award Agreements may be executed electronically by the Award recipient.

(d) Indemnification. Neither the Board nor the Committee, nor any member of either or any delegate thereof, shall be liable for any act, omission, interpretation, construction or determination made in good faith in connection with the Plan, and the members of the Board and the Committee (and any delegate thereof) shall be entitled in all cases to indemnification and reimbursement by the Company in respect of any claim, loss, damage or expense (including, without limitation, reasonable attorneys' fees) arising or resulting therefrom to the fullest extent permitted by law and/or under the Company's governing documents, including its certificate of incorporation or bylaws, or any directors' and officers' liability insurance coverage which may be in effect from time to time and/or any indemnification agreement between such individual and the Company.

(e) Foreign Award Recipients. Notwithstanding any provision of the Plan to the contrary, in order to comply with the laws in other countries in which the Company and any Subsidiary operate or have employees or other individuals eligible for Awards, the Committee, in its sole discretion, shall have the power and authority to: (i) determine which Subsidiaries, if any, shall be covered by the Plan; (ii) determine which individuals, if any, outside the United States are eligible to participate in the Plan; (iii) modify the terms and conditions of any Award granted to individuals outside the United States to comply with applicable foreign laws; (iv) establish subplans and modify exercise procedures and other terms and procedures, to the extent the Committee determines such actions to be necessary or advisable (and such subplans and/or modifications shall be attached to the Plan as appendices); provided, however, that no such subplans and/or modifications shall increase the share limitation contained in Section 3(a) hereof; and (v) take any action, before or after an Award is made, that the Committee determines to be necessary or advisable to obtain approval or comply with any local governmental regulatory exemptions or approvals. Notwithstanding the foregoing, the Committee may not take any actions hereunder, and no Awards shall be granted, that would violate the Exchange Act or any other applicable United States securities law, the Code, or any other applicable United States governing statute or law.

SECTION 3. STOCK ISSUABLE UNDER THE PLAN; MERGERS AND OTHER TRANSACTIONS; SUBSTITUTION

(a) Stock Issuable. The maximum number of Shares reserved and available for issuance under the Plan shall be 26,624,362 Shares, subject to adjustment as provided in Section 3(b) hereof. For purposes of this limitation, the shares of Stock underlying any Awards that are forfeited, canceled, withheld upon exercise of an Option or settlement of an Award to cover the exercise price or tax withholding, reacquired by the Company prior to vesting, satisfied without the issuance of Stock or otherwise terminated (other than by exercise), in each case shall be added back to the shares of Stock available for issuance under the Plan. Subject to such overall limitations, shares of Stock may be issued up to such maximum number pursuant to any type or types of Award. The shares available for issuance under the Plan may be authorized but unissued shares of Stock or shares of Stock reacquired by the Company.

(b) Changes in Stock. Subject to Section 3(c) hereof, if, as a result of any reorganization, recapitalization, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Company's capital stock, the outstanding shares of Stock are increased or decreased or are exchanged for a different number or kind of shares or other securities of the Company, or additional shares or new or different shares or other securities of the Company or other non-cash assets are distributed with respect to such shares of Stock or other securities, or, if, as a result of any merger or consolidation, or sale of all or substantially all of the assets of the Company, the outstanding shares of Stock are converted into or exchanged for securities of the Company or any successor entity (or a parent or subsidiary thereof), the Committee shall make an appropriate and equitable or proportionate adjustment in (i) the maximum number of shares reserved for issuance under the Plan, (ii) the number and kind of shares or other securities subject to any then outstanding Awards under the Plan, (iii) the repurchase price, if any, per share subject to each outstanding Award, and (iv) the exercise price for each share subject to any then outstanding Stock Options under the Plan, without changing the aggregate exercise price (i.e., the exercise price multiplied by the number of Stock Options) as to which such Stock Options remain exercisable. The adjustment by the Committee shall be final, binding and conclusive. No fractional shares of Stock shall be issued under the Plan resulting from any such adjustment, but the Committee in its discretion may make a cash payment in lieu of fractional shares.

(c) Sale Events.

(i) Options.

(A) In the case of and subject to the consummation of a Sale Event, the Plan and all Options issued hereunder shall terminate upon the effective time of any such Sale Event unless provision is made in connection with the Sale Event for the assumption or continuation of Options theretofore granted by the successor entity, or the substitution of such Options with new Options of the successor entity or parent thereof, with an equitable or proportionate adjustment as to the number and kind of shares and, if appropriate, the per share exercise prices, as such parties shall agree (after taking into account any acceleration hereunder and/or pursuant to the terms of any Award Agreement).

(B) In the event of the termination of the Plan and all Options issued hereunder pursuant to Section 3(c), each Holder of Options shall be permitted, within a specified period of time prior to the consummation of the Sale Event as determined by the Committee, to exercise all such Options which are then exercisable or will become exercisable as of the effective time of the Sale Event; *provided, however*, that the exercise of Options not exercisable prior to the Sale Event shall be subject to the consummation of the Sale Event.

(C) Notwithstanding anything to the contrary in Section 3(c)(i)(A), in the event of a Sale Event, the Company shall have the right, but not the obligation, to make or provide for a cash payment to the grantees holding Options in exchange for the cancellation thereof, in an amount equal to the difference between (A) the value as determined by the Committee of the consideration payable per share of Stock pursuant to the Sale Event (the "Sale Price") times the number of shares of Stock subject to outstanding Options (to the extent then vested exercisable, including by reason of acceleration in connection with such Sale Event, at prices not in excess of the Sale Price) and (B) the aggregate exercise price of all such outstanding vested Options.

(ii) Option Shares. Unless otherwise provided in an Award Agreement, in the case of and subject to the consummation of a Sale Event, Option Shares shall be subject to the repurchase right set forth in Section 9(c)(i).

(iii) Restricted Stock and Restricted Stock Unit Awards.

(A) In the case of and subject to the consummation of a Sale Event, all Restricted Stock and Restricted Stock Unit Awards issued hereunder shall be forfeited immediately prior to the effective time of any such Sale Event unless provision is made in connection with the Sale Event for the assumption or continuation of such Awards by the successor entity, or the substitution of such Awards with new Awards of the successor entity or parent thereof, with an equitable or proportionate adjustment as to the number and kind of shares subject to such Awards as such parties shall agree (after taking into account any acceleration hereunder and/or pursuant to the terms of any Award Agreement).

(B) In the event of the forfeiture of shares of Restricted Stock issued hereunder pursuant to Section 3(c)(iii)(A), such shares of Restricted Stock shall be repurchased from the Holder thereof at a price per share equal to the lower of the original per share purchase price paid by the recipient (subject to adjustment as provided in Section 3(b)) or the current Fair Market Value of such shares, determined immediately prior to the effective time of the Sale Event.

(C) Notwithstanding anything to the contrary in Section 3(c)(iii)(A), in the event of a Sale Event, the Company shall have the right, but not the obligation, to make or provide for a cash payment to the grantees holding Restricted Stock or Restricted Stock Unit Awards in exchange for the cancellation thereof, in an amount equal to the Sale Price times the number of shares of Stock subject to such Awards, to be paid at the time of such Sale Event or upon the later vesting of such Awards.

(iv) Unrestricted Stock Awards. Unless otherwise provided in an Award Agreement, any shares of Unrestricted Stock shall be treated in a Sale Event the same as all other Shares then outstanding.

SECTION 4. ELIGIBILITY

Grantees under the Plan will be such full or part-time officers and other employees, directors, Consultants and key persons (including prospective employees, but conditioned on their employment) of the Company and any Subsidiary who are selected from time to time by the Committee in its sole discretion; provided, however, that an Incentive Stock Option may be granted only to a person who, at the time the Incentive Stock Option is granted, is an employee of the Company or any Subsidiary.

SECTION 5. STOCK OPTIONS

The grant of a Stock Option is contingent on the grantee executing a Stock Option Award Agreement. The terms and conditions of each such Stock Option Award Agreement shall be determined by the Committee, and such terms and conditions may differ among individual Awards and grantees, all of whom must be eligible persons under Section 4 hereof.

Stock Options granted under the Plan may be either Incentive Stock Options or Non-Qualified Stock Options. Incentive Stock Options may be granted only to employees of the Company or any Subsidiary that is a "subsidiary corporation" within the meaning of Section 424(f) of the Code. To the extent that any Option does not qualify as an Incentive Stock Option, it shall be deemed a Non-Qualified Stock Option.

No Incentive Stock Option shall be granted under the Plan after the date which is ten years from the date the Plan is approved by the Board.

(a) Terms of Stock Options. The Committee in its discretion may grant Stock Options to eligible officers, employees, directors, Consultants and key persons of the Company or any Subsidiary. Stock Options granted pursuant to this Section 5(a) shall be subject to the following terms and conditions and shall contain such additional terms and conditions, not inconsistent with the terms of the Plan, as the Committee shall deem desirable. If the Committee so determines, Stock Options may be granted in lieu of cash compensation at the optionee's election, subject to such terms and conditions as the Committee may establish.

(i) Exercise Price. The exercise price per share for the Stock covered by a Stock Option granted pursuant to Section 5(a) shall be determined by the Committee at the time of grant but shall not be less than 100 percent of the Fair Market Value on the Grant Date. In the case of an Incentive Stock Option that is granted to a Ten Percent Owner, the option price of such Incentive Stock Option shall not be less than 110 percent of the Fair Market Value on the Grant Date.

(ii) Option Term. The term of each Stock Option shall be fixed by the Committee, but no Stock Option shall be exercisable more than ten years after the date the Stock Option is granted. In the case of an Incentive Stock Option that is granted to a Ten Percent Owner, the term of such Stock Option shall be no more than five years from the Grant Date.

(iii) Exercisability; Rights of a Stockholder. Stock Options shall become exercisable and/or vested at such time or times, whether or not in installments, as shall be determined by the Committee at or after the Grant Date. The Award Agreement may permit an optionee to exercise all or a portion of a Stock Option immediately at grant; provided that the Option Shares issued upon such exercise shall be subject to restrictions and a vesting schedule identical to the vesting schedule of the related Stock Option and the optionee shall be required to enter into a Restricted Stock Award Agreement and any other similar documentation required by the Company as a condition to exercise of such Stock Option. An optionee shall have the rights of a stockholder only as to shares acquired upon the exercise of a Stock Option and not as to unexercised Stock Options. An optionee shall not be deemed to have acquired any such shares unless and until a Stock Option shall have been exercised pursuant to the terms hereof and the optionee's name shall have been entered on the books of the Company as a stockholder.

(iv) Method of Exercise. Stock Options may be exercised by an optionee in whole or in part, by the optionee giving written notice of exercise to the Company, specifying the number of shares to be purchased. Payment of the purchase price may be made by one or more of the following methods (or any combination thereof) to the extent provided in the Option Award Agreement:

(A) In cash, by certified or bank check, by wire transfer of immediately available funds, or other instrument acceptable to the Committee;

(B) If permitted by the Committee, by the optionee delivering to the Company a promissory note, if the Board has expressly authorized the loan of funds to the optionee for the purpose of enabling or assisting the optionee to effect the exercise of his or her Stock Option; provided, that at least so much of the exercise price as represents the par value of the Stock shall be paid other than with a promissory note if required by state law;

(C) If permitted by the Committee and the Initial Public Offering has occurred (or the Stock otherwise becomes publicly-traded), through the delivery (or attestation to the ownership) of shares of Stock that have been purchased by the optionee on the open market or that are beneficially owned by the optionee and are not then subject to restrictions under any Company plan. To the extent required to avoid variable accounting treatment under FASB ASC Topic 718 or other applicable accounting rules, such surrendered shares if originally purchased from the Company shall have been owned by the optionee for at least six months. Such surrendered shares shall be valued at Fair Market Value on the exercise date;

(D) If permitted by the Committee and the Initial Public Offering has occurred (or the Stock otherwise becomes publicly-traded), by the optionee delivering to the Company a properly executed exercise notice together with irrevocable instructions to a broker to promptly deliver to the Company cash or a check payable and acceptable to the Company for the purchase price; provided that in the event the optionee chooses to pay the purchase price as so provided, the optionee and the broker shall comply with such procedures and enter into such agreements of indemnity and other agreements as the Committee shall prescribe as a condition of such payment procedure; and

(E) If permitted by the Committee, with respect to Stock Options that are not Incentive Stock Options, by a "net exercise" arrangement pursuant to which the Company will reduce the number of shares of Stock issuable upon exercise by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price.

Payment instruments will be received subject to collection. No certificates for shares of Stock so purchased will be issued to the optionee or, with respect to uncertificated Stock, no transfer to the optionee on the records of the Company will take place, until the Company has completed all steps required by law to be taken in connection with the issuance and sale of the shares, including without limitation (i) receipt of a representation from the optionee at the time of exercise of the Option that the optionee is purchasing the shares for the optionee's own account and not with a view to any sale or distribution thereof, (ii) the legending of any certificate (or notation on any book entry) representing the shares to evidence the foregoing restrictions, and (iii) obtaining from optionee payment or provision for all withholding taxes due as a result of the exercise of the Option. The delivery of certificates representing the shares of Stock (or the transfer to the optionee on the records of the Company with respect to uncertificated Stock) to be purchased pursuant to the exercise of a Stock Option will be contingent upon receipt from the optionee (or a purchaser acting in his or her stead in accordance with the provisions of the Stock Option) by the Company of the full purchase price for such shares and the fulfillment of any other requirements contained in the Option Award Agreement or applicable provisions of laws. In the event an optionee chooses to pay the purchase price by previously-owned shares of Stock through the attestation method, the number of shares of Stock transferred to the optionee upon the exercise of the Stock Option shall be net of the number of shares attested to.

(b) Annual Limit on Incentive Stock Options. To the extent required for "incentive stock option" treatment under Section 422 of the Code, the aggregate Fair Market Value (determined as of the time of grant) of the shares of Stock with respect to which Incentive Stock Options granted under the Plan and any other plan of the Company or its parent and any Subsidiary that become exercisable for the first time by an optionee during any calendar year shall not exceed $100,000 or such other limit as may be in effect from time to time under Section 422 of the Code. To the extent that any Stock Option exceeds this limit, it shall constitute a Non-Qualified Stock Option.

SECTION 6. RESTRICTED STOCK AWARDS

(a) Nature of Restricted Stock Awards. The Committee may, in its sole discretion, grant (or sell at par value or such higher purchase price determined by the Committee) to an eligible person under Section 4 hereof a Restricted Stock Award under the Plan. The Committee shall determine the restrictions and conditions applicable to each Restricted Stock Award at the time of grant. Conditions may be based on continuing employment (or other Service Relationship), achievement of pre-established performance goals and objectives and/or such other criteria as the Committee may determine. The grant of a Restricted Stock Award is contingent on the grantee executing a Restricted Stock Award Agreement. The terms and conditions of each such Award Agreement shall be determined by the Committee, and such terms and conditions may differ among individual Awards and grantees, all of whom must be eligible persons under Section 4 hereof.

(b) Rights as a Stockholder. Upon execution of a Restricted Stock Award Agreement and payment of any applicable purchase price, a grantee of Restricted Stock shall be considered the record owner of and shall be entitled to vote the Shares of Restricted Stock if, and to the extent, such Shares are entitled to voting rights, subject to such conditions contained in the Restricted Stock Award Agreement. The grantee shall be entitled to receive all dividends and any other distributions declared on the Shares; provided, however, that the Company is under no duty to declare any such dividends or to make any such distribution. The Restricted Stock Award Agreement may require or permit the immediate payment, waiver, deferral or investment of dividends paid on the Restricted Stock. Unless the Committee shall otherwise determine, certificates evidencing the Restricted Stock shall remain in the possession of the Company until such Restricted Stock is vested as provided in subsection (d) below of this Section, and the grantee shall be required, as a condition of the grant, to deliver to the Company a stock power endorsed in blank and such other instruments of transfer as the Committee may prescribe.

(c) Restrictions. Restricted Stock may not be sold, assigned, transferred, pledged or otherwise encumbered or disposed of except as specifically provided herein or in the Restricted Stock Award Agreement. Except as may otherwise be provided by the Committee either in the Award Agreement or, subject to Section 13 below, in writing after the Award Agreement is issued, if any, if a grantee's employment (or other Service Relationship) with the Company and any Subsidiary terminates, the Company or its assigns shall have the right, as may be specified in the relevant instrument, to repurchase some or all of the Shares subject to the Award at such purchase price as is set forth in the Restricted Stock Award Agreement.

(d) Vesting of Restricted Stock. The Committee at the time of grant shall specify the date or dates and/or the attainment of pre-established performance goals, objectives and other conditions on which the substantial risk of forfeiture imposed shall lapse and the Restricted Stock shall become vested, subject to such further rights of the Company or its assigns as may be specified in the Restricted Stock Award Agreement.

SECTION 7. UNRESTRICTED STOCK AWARDS

(a) Grant or Sale of Unrestricted Stock. The Committee may, in its sole discretion, grant (or sell at par value or such higher purchase price determined by the Committee) to an eligible person under Section 4 hereof an Unrestricted Stock Award under the Plan. Unrestricted Stock Awards may be granted in respect of past services or other valid consideration, or in lieu of cash compensation due to such grantee.

(b) Elections to Receive Unrestricted Stock In Lieu of Compensation. Upon the request of an eligible person under Section 4 hereof and with the consent of the Committee, each such grantee may, pursuant to an advance written election delivered to the Company no later than the date specified by the Committee, receive a portion of any cash compensation otherwise due to such grantee in the form of shares of Unrestricted Stock.

SECTION 8. RESTRICTED STOCK UNITS

(a) Nature of Restricted Stock Units. The Committee shall determine the restrictions and conditions applicable to each Restricted Stock Unit at the time of grant. Vesting conditions may be based on continuing employment (or other Service Relationship), achievement of pre-established performance goals and objectives and/or other such criteria as the Committee may determine. The grant of Restricted Stock Unit(s) is contingent on the grantee executing a Restricted Stock Unit Award Agreement. The terms and conditions of each such Award Agreement shall be determined by the Committee and may differ among individual Awards and grantees. On or promptly following the vesting date or dates applicable to any Restricted Stock Unit, such Restricted Stock Unit(s), shall be settled in the form of cash or shares of Stock, as specified in the Award Agreement.

(b) Rights as a Stockholder. A grantee shall have the rights of a stockholder only as to shares of Stock, if any, acquired upon settlement of a Restricted Stock Unit. A grantee shall not be deemed to have acquired any such shares unless and until a Restricted Stock Unit shall have been settled in Stock pursuant to the terms hereof, the Company shall have issued and delivered a certificate representing the shares to the grantee, and the grantee's name shall have been entered in the books of the Company as a stockholder.

(c) Termination. Except as may otherwise be provided by the Committee either in the Award Agreement or in writing after the Award Agreement is issued, a grantee's right in all Restricted Stock Units that have not vested shall automatically terminate upon the grantee's termination of employment (or cessation of Service Relationship) with the Company and any Subsidiary for any reason.

SECTION 9. TRANSFER RESTRICTIONS; COMPANY RIGHT OF FIRST REFUSAL; COMPANY REPURCHASE RIGHTS

(a) Restrictions on Transfer.

(i) Non-Transferability of Stock Options. No Stock Option shall be transferable by the optionee otherwise than by will or by the laws of descent and distribution and all Stock Options shall be exercisable, during the optionee's lifetime, only by the optionee, or by the optionee's legal representative or guardian in the event of the optionee's incapacity. Notwithstanding the foregoing, the Committee, in its sole discretion, may provide in the Award Agreement regarding a given Stock Option that the optionee may transfer, without consideration for the transfer, his or her Non-Qualified Stock Options to members of his or her immediate family, to trusts for the benefit of such family members, or to partnerships in which such family members are the only partners, provided that the transferee agrees in writing with the Company to be bound by all of the terms and conditions of this Plan and the applicable Option.

(ii) Issued Shares. No Issued Shares shall be sold, assigned, transferred, pledged, hypothecated, given away or in any other manner disposed of or encumbered, whether voluntarily or by operation of law, unless (i) such transfer is in compliance with the terms of the applicable Award Agreement, all applicable securities laws (including, without limitation, the Securities Act), and with the terms and conditions of this Section 9, (ii) such transfer does not cause the Company to become subject to the reporting requirements of the Exchange Act, and (iii) the transferee consents in writing to be bound by the provisions of the Plan, including this Section 9. In connection with any proposed transfer, the Committee may require the transferor to provide at the transferor's own expense an opinion of counsel to the transferor, satisfactory to the Committee, that such transfer is in compliance with all foreign, federal and state securities laws (including, without limitation, the Securities Act). Any attempted disposition of Issued Shares not in accordance with the terms and conditions of this Section 9 shall be null and void, and the Company shall not reflect on its records any change in record ownership of any Issued Shares as a result of any such disposition, shall otherwise refuse to recognize any such disposition and shall not in any way give effect to any such disposition of Issued Shares. Subject to the foregoing general provisions, and unless otherwise provided in the applicable Award Agreement, Issued Shares may be transferred pursuant to the following specific terms and conditions (provided that with respect to any transfer of Restricted Stock, all vesting and forfeiture provisions shall continue to apply only with respect to the original recipient):

(A) Transfers to Permitted Transferees. The Holder may sell, assign, transfer or give away any or all of the Issued Shares to Permitted Transferees; *provided*, *however*, that following such sale, assignment, or other transfer, such Issued Shares shall continue to be subject to the terms of this Plan (including this Section 9) and such Permitted Transferee(s) shall, as a condition to any such transfer, deliver a written acknowledgment to that effect to the Company.

(B) Transfers Upon Death. Upon the death of the Holder, any Issued Shares then held by the Holder at the time of such death and any Issued Shares acquired thereafter by the Holder's legal representative shall be subject to the provisions of this Plan, and the Holder's estate, executors, administrators, personal representatives, heirs, legatees and distributees shall be obligated to convey such Issued Shares to the Company or its assigns under the terms contemplated hereby.

(b) Right of First Refusal. In the event that a Holder desires at any time to sell or otherwise transfer all or any part of such Holder's Issued Shares (other than shares of Restricted Stock which by their terms are not transferrable), the Holder first shall give written notice to the Company of the Holder's intention to make such transfer. Such notice shall state the number of Issued Shares which the Holder proposes to sell (the "Offered Shares"), the price and the terms at which the proposed sale is to be made and the name and address of the proposed transferee. At any time within 30 days after the receipt of such notice by the Company, the Company or its assigns may elect to purchase all or any portion of the Offered Shares at the price and on the terms offered by the proposed transferee and specified in the notice. The Company or its assigns shall exercise this right by mailing or delivering written notice to the Holder within the foregoing 30-day period. If the Company or its assigns elect to exercise its purchase rights under this Section 9(b), the closing for such purchase shall, in any event, take place within 45 days after the receipt by the Company of the initial notice from the Holder. In the event that the Company or its assigns do not elect to exercise such purchase right, or in the event that the Company or its assigns do not pay the full purchase price within such 45-day period, the Holder may, within 60 days thereafter, sell the Offered Shares to the proposed transferee and at the same price and on the same terms as specified in the Holder's notice. Any Shares purchased by such proposed transferee shall no longer be subject to the terms of the Plan. Any Shares not sold to the proposed transferee shall remain subject to the Plan.

(c) Company's Right of Repurchase.

(i) Right of Repurchase for Option Shares. The Company or its assigns shall have the right and option upon a Repurchase Event to repurchase from a Holder of Option Shares some or all (as determined by the Company) of the Option Shares held or subsequently acquired upon exercise of a Stock Option by such Holder at the price per share specified below. Such repurchase right may be exercised by the Company within the later of (A) six months following the date of such Repurchase Event or (B) seven months after the acquisition of such Option Shares upon exercise of a Stock Option (the "Option Shares Repurchase Period"). The "Option Shares Repurchase Price" shall be equal to the Fair Market Value of the Option Shares, determined as of the date the Committee elects to exercise its repurchase rights in connection with a Repurchase Event.

(ii) Right of Repurchase With Respect to Restricted Stock and Shares issued pursuant to an Unrestricted Stock Award or Restricted Stock Unit Award. Unless otherwise set forth in the agreement entered into by the recipient and the Company in connection with a Restricted Stock Award, Unrestricted Stock Award or Restricted Stock Unit Award, the Company or its assigns shall have the right and option upon a Repurchase Event to repurchase from a Holder of Issued Shares received pursuant to a Restricted Stock Award, Unrestricted Stock Award or Restricted Stock Unit Award some or all (as determined by the Company) of such Issued Shares at the price per share specified below. In addition, upon a Termination Event, the Company or its assigns shall have the right and option to repurchase from a Holder of Issued Shares received pursuant to a Restricted Stock Award any Issued Shares which have not vested as of the Termination Event. Such repurchase right may be exercised by the Company within six months following the date of such Repurchase Event or Termination Event as applicable (the "Non-Option Shares Repurchase Period"). The "Non-Option Shares Repurchase Price" shall be (i) in the case of Issued Shares which are vested as of the date of the Repurchase Event, the Fair Market Value of such Issued Shares as of the date the Company elects to exercise its repurchase rights in connection with a Repurchase Event and (ii) in the case of Issued Shares which have not vested as of the date of the Repurchase Event or Termination Event (as applicable), the lower of the original per share purchase price paid by the recipient subject to adjustment as provided in Section 3(b) or the current Fair Market Value of such Issued Shares as of the date the Company elects to exercise its repurchase rights in connection with a Repurchase Event or Termination Event (as applicable).

(iii) Procedure. Any repurchase right of the Company shall be exercised by the Company or its assigns by giving the Holder written notice on or before the last day of the Option Shares Repurchase Period or Non-Option Shares Repurchase Period, as applicable, of its intention to exercise such repurchase right. Upon such notification, the Holder shall promptly surrender to the Company, free and clear of any liens or encumbrances, any certificates representing the Shares being purchased, together with a duly executed stock power for the transfer of such Shares to the Company or the Company's assignee or assignees. Upon the Company's or its assignee's receipt of the certificates from the Holder, the Company or its assignee or assignees shall deliver to him, her or them a check for the Option Shares Repurchase Price or the Non-Option Shares Repurchase Price, as applicable; *provided*, *however*, that the Company may pay the Option Shares Repurchase Price or Non-Option Shares Repurchase Price, as applicable, by offsetting and canceling any indebtedness then owed by the Holder to the Company.

(d) Drag Along Right. In the event the holders of a majority of the Company's equity securities then outstanding (the "Majority Shareholders") determine to enter into a Sale Event in a *bona fide* negotiated transaction (a "Sale"), with any non-Affiliate of the Company or any majority shareholder (in each case, the "Buyer"), a Holder of Issued Shares, including any Permitted Transferees, shall be obligated to and shall upon the written request of the Majority Shareholders: (a) sell, transfer and deliver, or cause to be sold, transferred and delivered, to the Buyer, his or her Issued Shares (including for this purpose all of such Holder's or his or her Permitted Transferee's Issued Shares that presently or as a result of any such transaction may be acquired upon the exercise of an Option (following the payment of the exercise price therefor)) on substantially the same terms applicable to the Majority Shareholders (with appropriate adjustments to reflect the conversion of convertible securities, the redemption of redeemable securities and the exercise of exercisable securities as well as the relative preferences and priorities of preferred stock); and (b) execute and deliver such instruments of conveyance and transfer and take such other action, including voting such Issued Shares in favor of any Sale proposed by the Majority Shareholders and executing any purchase agreements, merger agreements, indemnity agreements, escrow agreements or related documents as the Majority Shareholders or the Buyer may reasonably require in order to carry out the terms and provisions of this Section 9(d).

(e) Escrow Arrangement.

(i) Escrow. In order to carry out the provisions of Sections 9(b), (c), and (d) of this Agreement more effectively, the Company shall hold any Issued Shares in escrow together with separate stock powers executed by the Holder in blank for transfer, and any Permitted Transferee shall, as an additional condition to any transfer of Issued Shares, execute a like stock power as to such Issued Shares. The Company shall not dispose of the Issued Shares except as otherwise provided in this Agreement. In the event of any repurchase by the Company (or any of its assigns), the Company is hereby authorized by the Holder and any Permitted Transferee, as the Holder's and each such Permitted Transferee's attorney-in-fact, to date and complete the stock powers necessary for the transfer of the Issued Shares being purchased and to transfer such Issued Shares in accordance with the terms hereof. At such time as any Issued Shares are no longer subject to the Company's repurchase, first refusal and drag along rights, the Company shall, at the written request of the Holder, deliver to the Holder (or the relevant Permitted Transferee) a certificate representing such Issued Shares with the balance of the Issued Shares to be held in escrow pursuant to this Section 9(e).

(ii) Remedy. Without limitation of any other provision of this Agreement or other rights, in the event that a Holder, any Permitted Transferees or any other Person is required to sell a Holder's Issued Shares pursuant to the provisions of Sections 9(b), (c), or (d) hereof and in the further event that he or she refuses or for any reason fails to deliver to the Company or its designated purchaser of such Issued Shares the certificate or certificates evidencing such Issued Shares together with a related stock power, the Company or such designated purchaser may deposit the applicable purchase price for such Issued Shares with a bank designated by the Company, or with the Company's independent public accounting firm, as agent or trustee, or in escrow, for such Holder, any Permitted Transferees or other Person, to be held by such bank or accounting firm for the benefit of and for delivery to him, her, them or it, and/or, in its discretion, pay such purchase price by offsetting any indebtedness then owed by such Holder as provided above. Upon any such deposit and/or offset by the Company or its designated purchaser of such amount and upon notice to the Person who was required to sell the Issued Shares to be sold pursuant to the provisions of Sections 9(b), (c), or (d), such Issued Shares shall at such time be deemed to have been sold, assigned, transferred and conveyed to such purchaser, such Holder shall have no further rights thereto (other than the right to withdraw the payment thereof held in escrow, if applicable), and the Company shall record such transfer in its stock transfer book or in any appropriate manner.

(f) Lockup Provision. A Holder agrees, if requested by the Company and any underwriter engaged by the Company, not to sell or otherwise transfer or dispose of any Issued Shares (including, without limitation, pursuant to Rule 144 under the Securities Act) held by him or her for such period following the effective date of any registration statement of the Company filed under the Securities Act as the Company or such underwriter shall specify reasonably and in good faith.

(g) Adjustments for Changes in Capital Structure. If, as a result of any reorganization, recapitalization, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Common Stock, the outstanding shares of Common Stock are increased or decreased or are exchanged for a different number or kind of shares of the Company's Stock, the restrictions contained in this Section 9 shall apply with equal force to additional and/or substitute securities, if any, received by Holder in exchange for, or by virtue of his or her ownership of, Issued Shares.

(h) Termination. The terms and provisions of Section 9(b), Section 9(c) (except for the Company's right to repurchase unvested Restricted Stock Awards upon a Termination Event) and Section 9(d) shall terminate upon the closing of the Company's Initial Public Offering or upon consummation of any Sale Event, in either case as a result of which shares of the Company (or a successor entity) of the same class as the Issued Shares are registered under Section 12 of the Exchange Act and publicly-traded on NASDAQ or any national security exchange.

SECTION 10. TAX WITHHOLDING

(a) Payment by Grantee. Each grantee shall, no later than the date as of which the value of an Award or of any Stock or other amounts received thereunder first becomes includable in the gross income of the grantee for Federal income tax purposes, pay to the Company, or make arrangements satisfactory to the Committee regarding payment of, any Federal, state, or local taxes of any kind required by law to be withheld by the Company with respect to such income. The Company and any Subsidiary shall, to the extent permitted by law, have the right to deduct any such taxes from any payment of any kind otherwise due to the grantee. The Company's obligation to deliver stock certificates (or evidence of book entry) to any grantee is subject to and conditioned on any such tax withholding obligations being satisfied by the grantee.

(b) Payment in Stock. Subject to approval by the Committee, a grantee may elect to have the Company's required tax withholding obligation satisfied, in whole or in part, by authorizing the Company to withhold from shares of Stock to be issued pursuant to any Award a number of shares with an aggregate Fair Market Value (as of the date the withholding is effected) that would satisfy the applicable withholding amount due.

SECTION 11. SECTION 409A AWARDS.

To the extent that any Award is determined to constitute "nonqualified deferred compensation" within the meaning of Section 409A (a "409A Award"), the Award shall be subject to such additional rules and requirements as specified by the Committee from time to time in order to comply with Section 409A. In this regard, if any amount under a 409A Award is payable upon a "separation from service" (within the meaning of Section 409A) to a grantee who is considered a "specified employee" (within the meaning of Section 409A), then no such payment shall be made prior to the date that is the earlier of (i) six months and one day after the grantee's separation from service, or (ii) the grantee's death, but only to the extent such delay is necessary to prevent such payment from being subject to interest, penalties and/or additional tax imposed pursuant to Section 409A.

SECTION 12. TRANSFER, LEAVE OF ABSENCE, ETC.

For purposes of the Plan, the following events shall not be deemed a termination of a Service Relationship:

(a) a transfer to the employment of the Company from a Subsidiary or from the Company to a Subsidiary, or from one Subsidiary to another; or

(b) an approved leave of absence for military service or sickness, or for any other purpose approved by the Company, if the employee's right to re-employment is guaranteed either by a statute or by contract or under the policy pursuant to which the leave of absence was granted or if the Committee otherwise so provides in writing.

SECTION 13. AMENDMENTS AND TERMINATION

The Board may, at any time, amend or discontinue the Plan and the Committee may, at any time, amend or cancel any outstanding Award (or provide substitute Awards at the same or a reduced exercise or purchase price or with no exercise or purchase price in a manner not inconsistent with the terms of the Plan; provided, that such price, if any, must satisfy the requirements which would apply to the substitute or amended Award if it were then initially granted under the Plan for the purpose of satisfying changes in law or for any other lawful purpose), but no such action shall adversely affect rights under any outstanding Award without the consent of the holder of the Award. The Committee may exercise its discretion to reduce the exercise price of outstanding Stock Options or effect repricing through cancellation of outstanding Awards and by granting such holders new Awards in replacement of the cancelled Awards. To the extent determined by the Committee to be required either by the Code to ensure that Incentive Stock Options granted under the Plan are qualified under Section 422 of the Code or otherwise, Plan amendments shall be subject to approval by the Company stockholders entitled to vote at a meeting of stockholders. Nothing in this Section 13 shall limit the Board's or Committee's authority to take any action permitted pursuant to Section 3(c).

SECTION 14. STATUS OF PLAN

With respect to the portion of any Award that has not been exercised and any payments in cash, Stock or other consideration not received by a grantee, a grantee shall have no rights greater than those of a general creditor of the Company unless the Committee shall otherwise expressly so determine in connection with any Award or Awards. In its sole discretion, the Committee may authorize the creation of trusts or other arrangements to meet the Company's obligations to deliver Stock or make payments with respect to Awards hereunder; provided, that the existence of such trusts or other arrangements is consistent with the foregoing sentence.

SECTION 15. GENERAL PROVISIONS

(a) No Distribution; Compliance with Legal Requirements. The Committee may require each person acquiring Stock pursuant to an Award to represent to and agree with the Company in writing that such person is acquiring the shares of Stock without a view to distribution thereof. No shares of Stock shall be issued pursuant to an Award until all applicable securities law and other legal and stock exchange or similar requirements have been satisfied. The Committee may require the placing of such stop-orders and restrictive legends on certificates for Stock and Awards as it deems appropriate.

(b) Delivery of Stock Certificates. Stock certificates to grantees under the Plan shall be deemed delivered for all purposes when the Company or a stock transfer agent of the Company shall have mailed such certificates in the United States mail, addressed to the grantee, at the grantee's last known address on file with the Company. Uncertificated Stock shall be deemed delivered for all purposes when the Company or a Stock transfer agent of the Company shall have given to the grantee by electronic mail (with proof of receipt) or by United States mail, addressed to the grantee, at the grantee's last known address on file with the Company, notice of issuance and recorded the issuance in its records (which may include electronic "book entry" records).

(c) Other Compensation Arrangements; No Employment Rights**.** Nothing contained in the Plan shall prevent the Board from adopting other or additional compensation arrangements, including trusts, and such arrangements may be either generally applicable or applicable only in specific cases. The adoption of the Plan and the grant of Awards do not confer upon any employee any right to continued employment or Service Relationship with the Company or any Subsidiary.

(d) Trading Policy Restrictions. Option exercises and other Awards under the Plan shall be subject to such Company's insider trading policy-related restrictions, terms and conditions as may be established by the Committee, or in accordance with policies set by the Committee, from time to time.

(e) Designation of Beneficiary. Each grantee to whom an Award has been made under the Plan may designate a beneficiary or beneficiaries to exercise any Award on or after the grantee's death or receive any payment under any Award payable on or after the grantee's death. Any such designation shall be on a form provided for that purpose by the Committee and shall not be effective until received by the Committee. If no beneficiary has been designated by a deceased grantee, or if the designated beneficiaries have predeceased the grantee, the beneficiary shall be the grantee's estate.

(f) Legend. Any certificate(s) representing the Issued Shares shall carry substantially the following legend (and with respect to uncertificated Stock, the book entries evidencing such shares shall contain the following notation):

> The transferability of this certificate and the shares of stock represented hereby are subject to the restrictions, terms and conditions (including repurchase and restrictions against transfers) contained in the Rapid Micro Biosystems, Inc. 2010 Stock Option and Grant Plan and any agreement entered into thereunder by and between the company and the holder of this certificate (a copy of which is available at the offices of the company for examination).

SECTION 16. EFFECTIVE DATE OF PLAN

The Plan shall become effective upon approval of stockholders in accordance with applicable state law, and the Company's certificate of incorporation and bylaws. Subject to such approval by the stockholders and to the requirement that no Stock Option or other Award may be issued hereunder prior to such approval, Stock Options and other Awards may be granted hereunder on and after adoption of the Plan by the Board. No grants of Stock Options and other Awards may be made hereunder after the tenth anniversary of the Effective Date and no grants of Incentive Stock Options may be made hereunder after the tenth anniversary of the date the Plan is approved by the Board.

SECTION 17. GOVERNING LAW

This Plan, all Awards and any controversy arising out of or relating to this Plan and all Awards shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

DATE APPROVED BY THE BOARD OF DIRECTORS: April 28, 2020

DATE APPROVED BY THE STOCKHOLDERS: April 28, 2020

INCENTIVE STOCK OPTION AGREEMENT
UNDER THE RAPID MICRO BIOSYSTEMS, INC.
2010 STOCK OPTION AND GRANT PLAN

Name of Optionee:	As set forth on the grant summary (the "Grant Summary") on the website to which this agreement is associated (the "Optionee")
No. of Underlying Shares:	As set forth on the Grant Summary
Grant Date:	As set forth on the Grant Summary
Vesting Commencement Date:	As set forth on the Grant Summary (the "Vesting Commencement Date")
Expiration Date:	As set forth on the Grant Summary (the "Expiration Date")
Option Exercise Price/Share:	As set forth on the Grant Summary (the "Option Exercise Price")

Pursuant to the Rapid Micro Biosystems, Inc. 2010 Stock Option and Grant Plan (the "Plan"), Rapid Micro Biosystems, Inc., a Delaware corporation (together with any successor thereto, the "Company"), hereby grants to the Optionee, who is employed by the Company or any of its Subsidiaries, an option (the "Stock Option") to purchase on or prior to the Expiration Date, or such earlier date as is specified herein, all or any part of the number of shares of Common Stock, par value $.01 per share ("Common Stock"), of the Company indicated above (the "Underlying Shares," and such shares once issued shall be referred to as the "Option Shares"), at the Option Exercise Price per share, subject to the terms and conditions set forth in this Incentive Stock Option Agreement (this "Agreement") and in the Plan. This Stock Option is intended to qualify as an "incentive stock option" as defined in Section 422(b) of the Internal Revenue Code of 1986, as amended from time to time (the "Code"). To the extent that any portion of the Stock Option does not so qualify, it shall be deemed a non-qualified stock option.

All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Plan.

1. Vesting, Exercisability and Termination.

(a) No portion of this Stock Option may be exercised until such portion shall have vested and become exercisable.

(b) Subject to the determination of the Committee in its sole discretion to accelerate the vesting schedule hereunder, this Stock Option shall become vested and exercisable as set forth in the Grant Summary. Notwithstanding anything herein to the contrary in the case of a Sale Event, this Stock Option shall be treated as provided in Section 3(c) of the Plan.

(c) Termination. Except as may otherwise be provided by the Committee, if the Optionee's Service Relationship is terminated, the period within which to exercise this Stock Option will be subject to earlier termination as set forth below (and if not exercised within such period, shall thereafter terminate subject, in each case to Section 3(c) of the Plan):

(i) Termination Due to Death or Disability. If the Optionee's Service Relationship terminates by reason of such Optionee's death or disability (as defined in Section 422(c) of the Code), this Stock Option may be exercised, to the extent exercisable on the date of such termination, by the Optionee, the Optionee's legal representative or legatee for a period of 12 months from the date of death or disability or until the Expiration Date, if earlier.

(ii) Other Termination. If the Optionee's Service Relationship terminates for any reason other than death or disability (as defined in Section 422(c) of the Code), and unless otherwise determined by the Committee, this Stock Option may be exercised, to the extent exercisable on the date of termination, for a period of 90 days from the date of termination or until the Expiration Date or other termination date, if earlier; provided however, if the Optionee's Service Relationship is terminated for Cause, this Stock Option shall terminate immediately upon the date of such termination.

For purposes hereof, the Committee's determination of the reason for termination of the Optionee's Service Relationship shall be conclusive and binding on the Optionee and his or her representatives or legatees. Any portion of this Stock Option that is not exercisable on the date of termination of the Service Relationship shall terminate immediately and be null and void.

(d) It is understood and intended that this Stock Option is intended to qualify as an "incentive stock option" as defined in Section 422 of the Code to the extent permitted under applicable law. Accordingly, the Optionee understands that in order to obtain the benefits of an incentive stock option under Section 422 of the Code, no sale or other disposition may be made of Option Shares for which incentive stock option treatment is desired within the one-year period beginning on the day after the day of the transfer of such Option Shares to him or her, nor within the two-year period beginning on the day after Grant Date of this Stock Option and further that this Stock Option must be exercised within three months after termination of employment as an employee (or 12 months in the case of death or disability) to qualify as an incentive stock option. If the Optionee disposes (whether by sale, gift, transfer or otherwise) of any such Option Shares within either of these periods, he or she will notify the Company within 30 days after such disposition. The Optionee also agrees to provide the Company with any information concerning any such dispositions required by the Company for tax purposes. Further, to the extent the Underlying Shares and any other incentive stock options of the Optionee having an aggregate Fair Market Value in excess of $100,000 (determined as of the Grant Date) first become exercisable in any year, such options will not qualify as incentive stock options.

2. Exercise of Stock Option.

(a) The Optionee may exercise this Stock Option only in the following manner: Prior to the Expiration Date, the Optionee may deliver a Stock Option exercise notice (an "Exercise Notice") in the form of Appendix A hereto indicating his or her election to purchase some or all of the Underlying Shares with respect to which this Stock Option is exercisable at the time of such notice. Such notice shall specify the number of Underlying Shares to be purchased. Payment of the purchase price may be made by one or more of the methods described in Sections 5(a)(iv)(A), (B), (C) or (D) of the Plan, subject to the limitations contained in such Sections of the Plan, including the requirement that the Committee specifically approve in advance certain payment methods.

(b) Notwithstanding any other provision hereof or of the Plan, no portion of this Stock Option shall be exercisable after the Expiration Date.

3. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Stock Option shall be subject to and governed by all the terms and conditions of the Plan.

4. Transferability of Stock Option. This Agreement is personal to the Optionee and is not transferable by the Optionee in any manner other than by will or by the laws of descent and distribution. The Stock Option may be exercised during the Optionee's lifetime only by the Optionee (or by the Optionee's guardian or personal representative in the event of the Optionee's incapacity). The Optionee may elect to designate a beneficiary by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company; such beneficiary may exercise the Optionee's Stock Option in the event of the Optionee's death to the extent provided herein. If the Optionee does not designate a beneficiary, or if the designated beneficiary predeceases the Optionee, the legal representative of the Optionee may exercise this Stock Option to the extent provided herein in the event of the Optionee's death.

5. Restrictions on Transfer of Option Shares. The Option Shares acquired upon exercise of the Stock Option shall be subject to certain transfer restrictions and other limitations including, without limitation, the provisions contained in Section 9 of the Plan.

6. Miscellaneous Provisions.

(a) Equitable Relief. The parties hereto agree and declare that legal remedies may be inadequate to enforce the provisions of this Agreement and that equitable relief, including specific performance and injunctive relief, may be used to enforce the provisions of this Agreement.

(b) Adjustments for Changes in Capital Structure. If, as a result of any reorganization, recapitalization, reincorporation, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Common Stock, the outstanding shares of Common Stock are increased or decreased or are exchanged for a different number or kind of shares of the Company's stock, the restrictions contained in this Agreement shall apply with equal force to additional and/or substitute securities, if any, received by the Optionee in exchange for, or by virtue of his or her ownership of, Option Shares.

(c) Change and Modifications. This Agreement may not be orally changed, modified or terminated, nor shall any oral waiver of any of its terms be effective. This Agreement may be changed, modified or terminated only by an agreement in writing signed by the Company and the Optionee.

(d) Governing Law. This Agreement shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

(e) Headings. The headings are intended only for convenience in finding the subject matter and do not constitute part of the text of this Agreement and shall not be considered in the interpretation of this Agreement.

(f) Saving Clause. If any provision(s) of this Agreement shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

(g) Notices. All notices, requests, consents and other communications shall be in writing and be deemed given when delivered personally, by telex or facsimile transmission or when received if mailed by first class registered or certified mail, postage prepaid. Notices to the Company or the Optionee shall be addressed as set forth underneath their signatures below, or to such other address or addresses as may have been furnished by such party in writing to the other.

(h) Benefit and Binding Effect. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, their respective successors, permitted assigns, and legal representatives. The Company has the right to assign this Agreement, and such assignee shall become entitled to all the rights of the Company hereunder to the extent of such assignment.

(i) Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

7. Dispute Resolution.

(a) Except as provided below, any dispute arising out of or relating to the Plan or this Stock Option, this Agreement, or the breach, termination or validity of the Plan, this Stock Option or this Agreement, shall be finally settled by binding arbitration conducted expeditiously in accordance with the J.A.M.S./Endispute Comprehensive Arbitration Rules and Procedures (the “J.A.M.S. Rules”). The arbitration shall be governed by the United States Arbitration Act, 9 U.S.C. Sections 1 16, and judgment upon the award rendered by the arbitrators may be entered by any court having jurisdiction thereof. The place of arbitration shall be Boston, Massachusetts.

(b) The arbitration shall commence within 60 days of the date on which a written demand for arbitration is filed by any party hereto. In connection with the arbitration proceeding, the arbitrator shall have the power to order the production of documents by each party and any third-party witnesses. In addition, each party may take up to three depositions as of right, and the arbitrator may in his or her discretion allow additional depositions upon good cause shown by the moving party. However, the arbitrator shall not have the power to order the answering of interrogatories or the response to requests for admission. In connection with any arbitration, each party to the arbitration shall provide to the other, no later than seven business days before the date of the arbitration, the identity of all persons that may testify at the arbitration and a copy of all documents that may be introduced at the arbitration or considered or used by a party's witness or expert. The arbitrator's decision and award shall be made and delivered within six months of the selection of the arbitrator. The arbitrator's decision shall set forth a reasoned basis for any award of damages or finding of liability. The arbitrator shall not have power to award damages in excess of actual compensatory damages and shall not multiply actual damages or award punitive damages, and each party hereby irrevocably waives any claim to such damages.

(c) The Company, the Optionee, each party to the Agreement and any other holder of Stock issued pursuant to this Agreement (each, a "Party") covenants and agrees that such party will participate in the arbitration in good faith. This Section 7 applies equally to requests for temporary, preliminary or permanent injunctive relief, except that in the case of temporary or preliminary injunctive relief any party may proceed in court without prior arbitration for the limited purpose of avoiding immediate and irreparable harm.

(d) Each Party (i) hereby irrevocably submits to the jurisdiction of any United States District Court of competent jurisdiction for the purpose of enforcing the award or decision in any such proceeding, (ii) hereby waives, and agrees not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above named courts, that its property is exempt or immune from attachment or execution (except as protected by applicable law), that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court, and (iii) hereby waives and agrees not to seek any review by any court of any other jurisdiction which may be called upon to grant an enforcement of the judgment of any such court. Each Party hereby consents to service of process by registered mail at the address to which notices are to be given. Each Party agrees that its, his or her submission to jurisdiction and its, his or her consent to service of process by mail is made for the express benefit of each other Party. Final judgment against any Party in any such action, suit or proceeding may be enforced in other jurisdictions by suit, action or proceeding on the judgment, or in any other manner provided by or pursuant to the laws of such other jurisdiction.

[SIGNATURE PAGE FOLLOWS]

The foregoing Agreement is hereby accepted and the terms and conditions thereof hereby agreed to by the undersigned as of the date first above written.

RAPID MICRO BIOSYSTEMS, INC.

By: _____
Name:
Title:

Address: 1001 Pawtucket Blvd West
Lowell, MA 01854

Optionee acknowledges receiving and reviewing a copy of the Plan, including, without limitation, Section 9 thereof, and understands that the Stock Option granted hereby is subject to the terms of the Plan and of this Agreement. By his or her electronic acceptance of the Stock Option, Optionee agrees to the terms and conditions of the Plan and this Agreement, SPECIFICALLY INCLUDING THE ARBITRATION PROVISIONS IN SECTION 7 OF THIS AGREEMENT.

OPTIONEE:

_____
Name:

Address:

_____
_____
_____

[SPOUSE'S CONSENT[1]
I acknowledge that I have read the foregoing Incentive Stock Option Agreement and understand the contents thereof.

_____]

[1] A spouse's consent is required only if the Optionee's state of residence is one of the following community property states: Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, Washington and Wisconsin.

DESIGNATED BENEFICIARY:

Beneficiary's Address:

Appendix A

STOCK OPTION EXERCISE NOTICE

Rapid Micro Biosystems, Inc.
Attention: Chief Financial Officer
1001 Pawtucket Blvd West
Lowell, MA 01854

Pursuant to the terms of the stock option agreement between the undersigned and Rapid Micro Biosystems, Inc. (the "Company") dated _____ (the "Agreement") under the Rapid Micro Biosystems, Inc. 2010 Stock Option and Grant Plan, I, [Insert Name] _____, hereby [Circle One] partially/fully exercise such option by including herein payment in the amount of $_____ representing the purchase price for [Fill in number of Underlying Shares] _____ Underlying Shares. I have chosen the following form(s) of payment:

[ ] 1. Cash
[ ] 2. Certified or bank check payable to Rapid Micro Biosystems, Inc.
[ ] 3. Other (as referenced in the Agreement and described in the Plan (please describe))
_____.

In connection with my exercise of the option as set forth above, I hereby represent and warrant to the Company as follows:

(i) I am purchasing the Underlying Shares for my own account for investment only, and not for resale or with a view to the distribution thereof.

(ii) I have had such an opportunity as I have deemed adequate to obtain from the Company such information as is necessary to permit me to evaluate the merits and risks of my investment in the Company and have consulted with my own advisers with respect to my investment in the Company.

(iii) I have sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Underlying Shares and to make an informed investment decision with respect to such purchase.

(iv) I can afford a complete loss of the value of the Option Shares and am able to bear the economic risk of holding such Option Shares for an indefinite period of time.

(v) I understand that the Option Shares may not be registered under the Securities Act of 1933 (it being understood that the Option Shares are being issued and sold in reliance on the exemption provided in Rule 701 thereunder) or any applicable state securities or "blue sky" laws and may not be sold or otherwise transferred or disposed of in the absence of an effective registration statement under the Securities Act of 1933 and under any applicable state securities or "blue sky" laws (or exemptions from the registration requirement thereof). I further acknowledge that certificates representing Option Shares will bear restrictive legends reflecting the foregoing and/or that book entries for uncertificated Option Shares will include similar restrictive notations.

Sincerely yours,

_____

Name:

Address:

_____

_____

_____

INCENTIVE STOCK OPTION AGREEMENT
UNDER THE RAPID MICRO BIOSYSTEMS, INC.
2010 STOCK OPTION AND GRANT PLAN

Name of Optionee:	As set forth on the grant summary (the "Grant Summary") on the website to which this agreement is associated (the "Optionee")
No. of Underlying Shares:	As set forth on the Grant Summary
Grant Date:	As set forth on the Grant Summary
Vesting Commencement Date:	As set forth on the Grant Summary (the "Vesting Commencement Date")
Expiration Date:	As set forth on the Grant Summary (the "Expiration Date")
Option Exercise Price/Share:	As set forth on the Grant Summary (the "Option Exercise Price")

Pursuant to the Rapid Micro Biosystems, Inc. 2010 Stock Option and Grant Plan (the "Plan"), Rapid Micro Biosystems, Inc., a Delaware corporation (together with any successor thereto, the "Company"), hereby grants to the Optionee, who is employed by the Company or any of its Subsidiaries, an option (the "Stock Option") to purchase on or prior to the Expiration Date, or such earlier date as is specified herein, all or any part of the number of shares of Common Stock, par value $.01 per share ("Common Stock"), of the Company indicated above (the "Underlying Shares," and such shares once issued shall be referred to as the "Option Shares"), at the Option Exercise Price per share, subject to the terms and conditions set forth in this Incentive Stock Option Agreement (this "Agreement") and in the Plan. This Stock Option is intended to qualify as an "incentive stock option" as defined in Section 422(b) of the Internal Revenue Code of 1986, as amended from time to time (the "Code"). To the extent that any portion of the Stock Option does not so qualify, it shall be deemed a non-qualified stock option.

All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Plan.

1. Vesting, Exercisability and Termination.

(a) No portion of this Stock Option may be exercised until such portion shall have vested and become exercisable.

(b) Except as set forth below, and subject to the determination of the Committee in its sole discretion to accelerate the vesting schedule hereunder, this Stock Option shall become vested and exercisable as set forth in the Grant Summary.

Notwithstanding anything herein to the contrary in the case of a Sale Event, this Stock Option shall be treated as provided in Section 3(c) of the Plan; provided, however, notwithstanding anything herein to the contrary, in the event (and only in the event) that this Stock Option is assumed or continued by the Company or its successor entity in the sole discretion of the parties to a Sale Event and thereafter remains in effect following such Sale Event, then 100% of the then-unvested Underlying Shares shall be deemed vested and exercisable in full upon the date on which the Optionee's Service Relationship with the Company and its Subsidiaries or successor entity terminates if (A) such termination occurs in connection with and effective as of the date of, or within 12 months following the date of, such Sale Event and (B) such termination is either by the Company without Cause or by the Optionee for Good Reason. For purposes of this Stock Option, Good Reason shall mean (i) a material diminution in the Optionee's base salary except for across-the-board salary reductions based on the Company's financial performance similarly affecting all or substantially all senior management employees of the Company, (ii) a change of more than 50 miles in the geographic location at which the Optionee provides services to the Company or (iii) a material reduction in the Optionee's job responsibilities, provided that neither a mere change in title alone nor reassignment to a substantially similar position shall constitute a material reduction in job responsibilities. Notwithstanding the foregoing, a resignation shall not be for Good Reason unless (A) the Optionee has provided the Company or the successor company, within 60 days of the initial occurrence of the Good Reason event, written notice stating with reasonable specificity the applicable facts and circumstances underlying such finding of Good Reason; (B) the Company or the successor company fails to cure such condition within 30 days after receiving such written notice; and (C) the Optionee's resignation based on such Good Reason is effective within 30 days after the expiration of such cure period.

(c) Termination. Except as may otherwise be provided by the Committee, if the Optionee's Service Relationship is terminated, the period within which to exercise this Stock Option will be subject to earlier termination as set forth below (and if not exercised within such period, shall thereafter terminate subject, in each case to Section 3(c) of the Plan):

(i) Termination Due to Death or Disability. If the Optionee's Service Relationship terminates by reason of such Optionee's death or disability (as defined in Section 422(c) of the Code), this Stock Option may be exercised, to the extent exercisable on the date of such termination, by the Optionee, the Optionee's legal representative or legatee for a period of 12 months from the date of death or disability or until the Expiration Date, if earlier.

(ii) Other Termination. If the Optionee's Service Relationship terminates for any reason other than death or disability (as defined in Section 422(c) of the Code), and unless otherwise determined by the Committee, this Stock Option may be exercised, to the extent exercisable on the date of termination, for a period of 90 days from the date of termination or until the Expiration Date or other termination date, if earlier; provided however, if the Optionee's Service Relationship is terminated for Cause, this Stock Option shall terminate immediately upon the date of such termination.

For purposes hereof, the Committee's determination of the reason for termination of the Optionee's Service Relationship shall be conclusive and binding on the Optionee and his or her representatives or legatees. Any portion of this Stock Option that is not exercisable on the date of termination of the Service Relationship shall terminate immediately and be null and void.

(d) It is understood and intended that this Stock Option is intended to qualify as an "incentive stock option" as defined in Section 422 of the Code to the extent permitted under applicable law. Accordingly, the Optionee understands that in order to obtain the benefits of an incentive stock option under Section 422 of the Code, no sale or other disposition may be made of Option Shares for which incentive stock option treatment is desired within the one-year period beginning on the day after the day of the transfer of such Option Shares to him or her, nor within the two-year period beginning on the day after Grant Date of this Stock Option and further that this Stock Option must be exercised within three months after termination of employment as an employee (or 12 months in the case of death or disability) to qualify as an incentive stock option. If the Optionee disposes (whether by sale, gift, transfer or otherwise) of any such Option Shares within either of these periods, he or she will notify the Company within 30 days after such disposition. The Optionee also agrees to provide the Company with any information concerning any such dispositions required by the Company for tax purposes. Further, to the extent the Underlying Shares and any other incentive stock options of the Optionee having an aggregate Fair Market Value in excess of $100,000 (determined as of the Grant Date) first become exercisable in any year, such options will not qualify as incentive stock options.

2. Exercise of Stock Option.

(a) The Optionee may exercise this Stock Option only in the following manner: Prior to the Expiration Date, the Optionee may deliver a Stock Option exercise notice (an "Exercise Notice") in the form of Appendix A hereto indicating his or her election to purchase some or all of the Underlying Shares with respect to which this Stock Option is exercisable at the time of such notice. Such notice shall specify the number of Underlying Shares to be purchased. Payment of the purchase price may be made by one or more of the methods described in Sections 5(a)(iv)(A), (B), (C) or (D) of the Plan, subject to the limitations contained in such Sections of the Plan, including the requirement that the Committee specifically approve in advance certain payment methods.

(b) Notwithstanding any other provision hereof or of the Plan, no portion of this Stock Option shall be exercisable after the Expiration Date.

3. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Stock Option shall be subject to and governed by all the terms and conditions of the Plan.

4. Transferability of Stock Option. This Agreement is personal to the Optionee and is not transferable by the Optionee in any manner other than by will or by the laws of descent and distribution. The Stock Option may be exercised during the Optionee's lifetime only by the Optionee (or by the Optionee's guardian or personal representative in the event of the Optionee's incapacity). The Optionee may elect to designate a beneficiary by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company; such beneficiary may exercise the Optionee's Stock Option in the event of the Optionee's death to the extent provided herein. If the Optionee does not designate a beneficiary, or if the designated beneficiary predeceases the Optionee, the legal representative of the Optionee may exercise this Stock Option to the extent provided herein in the event of the Optionee's death.

5. Restrictions on Transfer of Option Shares. The Option Shares acquired upon exercise of the Stock Option shall be subject to certain transfer restrictions and other limitations including, without limitation, the provisions contained in Section 9 of the Plan.

6. Miscellaneous Provisions.

(a) Equitable Relief. The parties hereto agree and declare that legal remedies may be inadequate to enforce the provisions of this Agreement and that equitable relief, including specific performance and injunctive relief, may be used to enforce the provisions of this Agreement.

(b) Adjustments for Changes in Capital Structure. If, as a result of any reorganization, recapitalization, reincorporation, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Common Stock, the outstanding shares of Common Stock are increased or decreased or are exchanged for a different number or kind of shares of the Company's stock, the restrictions contained in this Agreement shall apply with equal force to additional and/or substitute securities, if any, received by the Optionee in exchange for, or by virtue of his or her ownership of, Option Shares.

(c) Change and Modifications. This Agreement may not be orally changed, modified or terminated, nor shall any oral waiver of any of its terms be effective. This Agreement may be changed, modified or terminated only by an agreement in writing signed by the Company and the Optionee.

(d) Governing Law. This Agreement shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

(e) Headings. The headings are intended only for convenience in finding the subject matter and do not constitute part of the text of this Agreement and shall not be considered in the interpretation of this Agreement.

(f) Saving Clause. If any provision(s) of this Agreement shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

(g) Notices. All notices, requests, consents and other communications shall be in writing and be deemed given when delivered personally, by telex or facsimile transmission or when received if mailed by first class registered or certified mail, postage prepaid. Notices to the Company or the Optionee shall be addressed as set forth underneath their signatures below, or to such other address or addresses as may have been furnished by such party in writing to the other.

(h) Benefit and Binding Effect. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, their respective successors, permitted assigns, and legal representatives. The Company has the right to assign this Agreement, and such assignee shall become entitled to all the rights of the Company hereunder to the extent of such assignment.

(i) Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

7. Dispute Resolution.

(a) Except as provided below, any dispute arising out of or relating to the Plan or this Stock Option, this Agreement, or the breach, termination or validity of the Plan, this Stock Option or this Agreement, shall be finally settled by binding arbitration conducted expeditiously in accordance with the J.A.M.S./Endispute Comprehensive Arbitration Rules and Procedures (the "J.A.M.S. Rules"). The arbitration shall be governed by the United States Arbitration Act, 9 U.S.C. Sections 1 16, and judgment upon the award rendered by the arbitrators may be entered by any court having jurisdiction thereof. The place of arbitration shall be Boston, Massachusetts.

(b) The arbitration shall commence within 60 days of the date on which a written demand for arbitration is filed by any party hereto. In connection with the arbitration proceeding, the arbitrator shall have the power to order the production of documents by each party and any third-party witnesses. In addition, each party may take up to three depositions as of right, and the arbitrator may in his or her discretion allow additional depositions upon good cause shown by the moving party. However, the arbitrator shall not have the power to order the answering of interrogatories or the response to requests for admission. In connection with any arbitration, each party to the arbitration shall provide to the other, no later than seven business days before the date of the arbitration, the identity of all persons that may testify at the arbitration and a copy of all documents that may be introduced at the arbitration or considered or used by a party's witness or expert. The arbitrator's decision and award shall be made and delivered within six months of the selection of the arbitrator. The arbitrator's decision shall set forth a reasoned basis for any award of damages or finding of liability. The arbitrator shall not have power to award damages in excess of actual compensatory damages and shall not multiply actual damages or award punitive damages, and each party hereby irrevocably waives any claim to such damages.

(c) The Company, the Optionee, each party to the Agreement and any other holder of Stock issued pursuant to this Agreement (each, a "Party") covenants and agrees that such party will participate in the arbitration in good faith. This Section 7 applies equally to requests for temporary, preliminary or permanent injunctive relief, except that in the case of temporary or preliminary injunctive relief any party may proceed in court without prior arbitration for the limited purpose of avoiding immediate and irreparable harm.

(d) Each Party (i) hereby irrevocably submits to the jurisdiction of any United States District Court of competent jurisdiction for the purpose of enforcing the award or decision in any such proceeding, (ii) hereby waives, and agrees not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above named courts, that its property is exempt or immune from attachment or execution (except as protected by applicable law), that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court, and (iii) hereby waives and agrees not to seek any review by any court of any other jurisdiction which may be called upon to grant an enforcement of the judgment of any such court. Each Party hereby consents to service of process by registered mail at the address to which notices are to be given. Each Party agrees that its, his or her submission to jurisdiction and its, his or her consent to service of process by mail is made for the express benefit of each other Party. Final judgment against any Party in any such action, suit or proceeding may be enforced in other jurisdictions by suit, action or proceeding on the judgment, or in any other manner provided by or pursuant to the laws of such other jurisdiction.

[SIGNATURE PAGE FOLLOWS]

The foregoing Agreement is hereby accepted and the terms and conditions thereof hereby agreed to by the undersigned as of the date first above written.

RAPID MICRO BIOSYSTEMS, INC.

By: _____
Name:
Title:

Address: 1001 Pawtucket Blvd West
Lowell, MA 01854

Optionee acknowledges receiving and reviewing a copy of the Plan, including, without limitation, Section 9 thereof, and understands that the Stock Option granted hereby is subject to the terms of the Plan and of this Agreement. By his or her electronic acceptance of the Stock Option, Optionee agrees to the terms and conditions of the Plan and this Agreement, SPECIFICALLY INCLUDING THE ARBITRATION PROVISIONS IN SECTION 7 OF THIS AGREEMENT.

OPTIONEE:

_____
Name:

Address:

_____
_____
_____

[SPOUSE'S CONSENT[1]
I acknowledge that I have read the foregoing Incentive Stock Option Agreement and understand the contents thereof.

_____]

[1] A spouse's consent is required only if the Optionee's state of residence is one of the following community property states: Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, Washington and Wisconsin.

DESIGNATED BENEFICIARY:

Beneficiary's Address:

Appendix A

STOCK OPTION EXERCISE NOTICE

Rapid Micro Biosystems, Inc.
Attention: Chief Financial Officer
1001 Pawtucket Blvd West
Lowell, MA 01854

Pursuant to the terms of the stock option agreement between the undersigned and Rapid Micro Biosystems, Inc. (the "Company") dated _____ (the "Agreement") under the Rapid Micro Biosystems, Inc. 2010 Stock Option and Grant Plan, I, [Insert Name] _____, hereby [Circle One] partially/fully exercise such option by including herein payment in the amount of $_____ representing the purchase price for [Fill in number of Underlying Shares] _____ Underlying Shares. I have chosen the following form(s) of payment:

[ ] 1. Cash
[ ] 2. Certified or bank check payable to Rapid Micro Biosystems, Inc.
[ ] 3. Other (as referenced in the Agreement and described in the Plan (please describe))
_____.

In connection with my exercise of the option as set forth above, I hereby represent and warrant to the Company as follows:

(i) I am purchasing the Underlying Shares for my own account for investment only, and not for resale or with a view to the distribution thereof.

(ii) I have had such an opportunity as I have deemed adequate to obtain from the Company such information as is necessary to permit me to evaluate the merits and risks of my investment in the Company and have consulted with my own advisers with respect to my investment in the Company.

(iii) I have sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Underlying Shares and to make an informed investment decision with respect to such purchase.

(iv) I can afford a complete loss of the value of the Option Shares and am able to bear the economic risk of holding such Option Shares for an indefinite period of time.

(v) I understand that the Option Shares may not be registered under the Securities Act of 1933 (it being understood that the Option Shares are being issued and sold in reliance on the exemption provided in Rule 701 thereunder) or any applicable state securities or "blue sky" laws and may not be sold or otherwise transferred or disposed of in the absence of an effective registration statement under the Securities Act of 1933 and under any applicable state securities or "blue sky" laws (or exemptions from the registration requirement thereof). I further acknowledge that certificates representing Option Shares will bear restrictive legends reflecting the foregoing and/or that book entries for uncertificated Option Shares will include similar restrictive notations.

Sincerely yours,

_____

Name:

Address:

_____

_____

_____

NON-QUALIFIED STOCK OPTION AGREEMENT
UNDER THE RAPID MICRO BIOSYSTEMS, INC.
2010 STOCK OPTION AND GRANT PLAN

Name of Optionee:	As set forth in the grant summary (the "Grant Summary") on the website to which this agreement is associated (the "Optionee")
No. of Underlying Shares:	As set forth in the Grant Summary
Grant Date:	As set forth in the Grant Summary
Vesting Commencement Date:	As set forth in the Grant Summary (the "Vesting Commencement Date")
Expiration Date:	As set forth in the Grant Summary (the "Expiration Date")
Option Exercise Price/Share:	As set forth in the Grant Summary (the "Option Exercise Price")

Pursuant to the Rapid Micro Biosystems, Inc. 2010 Stock Option and Grant Plan (the "Plan"), Rapid Micro Biosystems, Inc., a Delaware corporation (together with any successor thereto, the "Company"), hereby grants to the Optionee, who serves as an officer, employee, director, or other key person of the Company or any of its Subsidiaries, an option (the "Stock Option") to purchase on or prior to the Expiration Date, or such earlier date as is specified herein, all or any part of the number of shares of Common Stock, par value $.01 per share ("Common Stock"), of the Company indicated above (the "Underlying Shares," and such shares once issued shall be referred to as the "Option Shares"), at the Option Exercise Price per share, subject to the terms and conditions set forth in this Non-Qualified Stock Option Agreement (this "Agreement") and in the Plan. This Stock Option is not intended to qualify as an "incentive stock option" as defined in Section 422(b) of the Internal Revenue Code of 1986, as amended from time to time (the "Code").

All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Plan.

1. Vesting, Exercisability and Termination.

(a) No portion of this Stock Option may be exercised until such portion shall have vested and become exercisable.

(b) Subject to the determination of the Committee in its sole discretion to accelerate the vesting schedule hereunder, this Stock Option shall become vested and exercisable as set forth in the Grant Summary. Notwithstanding anything herein to the contrary in the case of a Sale Event, this Stock Option shall be treated as provided in Section 3(c) of the Plan.

(c) Termination. Except as may otherwise be provided by the Committee, if the Optionee's Service Relationship is terminated, the period within which to exercise this Stock Option will be subject to earlier termination as set forth below (and if not exercised within such period, shall thereafter terminate subject, in each case to Section 3(c) of the Plan):

(i) Termination Due to Death or Disability. If the Optionee's Service Relationship terminates by reason of such Optionee's death or disability (as defined in Section 422(c) of the Code), this Stock Option may be exercised, to the extent exercisable on the date of such termination, by the Optionee, the Optionee's legal representative or legatee for a period of 12 months from the date of death or disability or until the Expiration Date, if earlier.

(ii) Other Termination. If the Optionee's Service Relationship terminates for any reason other than death or disability (as defined in Section 422(c) of the Code), and unless otherwise determined by the Committee, this Stock Option may be exercised, to the extent exercisable on the date of termination, for a period of 90 days from the date of termination or until the Expiration Date or other termination date, if earlier; provided however, if the Optionee's Service Relationship is terminated for Cause, this Stock Option shall terminate immediately upon the date of such termination.

For purposes hereof, the Committee's determination of the reason for termination of the Optionee's Service Relationship shall be conclusive and binding on the Optionee and his or her representatives or legatees and any Permitted Transferee. Any portion of this Stock Option that is not exercisable on the date of termination of the Service Relationship shall terminate immediately and be null and void.

2. Exercise of Stock Option.

(a) The Optionee may exercise this Stock Option only in the following manner: Prior to the Expiration Date, the Optionee may deliver a Stock Option exercise notice (an "Exercise Notice") in the form of Appendix A hereto indicating his or her election to purchase some or all of the Underlying Shares with respect to which this Stock Option is exercisable at the time of such notice. Such notice shall specify the number of Underlying Shares to be purchased. Payment of the purchase price may be made by one or more of the methods described in Sections 5(a)(iv)(A), (B), (C), (D) or (E) of the Plan, subject to the limitations contained in such Sections of the Plan, including the requirement that the Committee specifically approve in advance certain payment methods.

(b) Notwithstanding any other provision hereof or of the Plan, no portion of this Stock Option shall be exercisable after the Expiration Date.

3. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Stock Option shall be subject to and governed by all the terms and conditions of the Plan.

4. Transferability of Stock Option. This Agreement is personal to the Optionee and is not transferable by the Optionee in any manner other than by will or by the laws of descent and distribution. The Stock Option may be exercised during the Optionee's lifetime only by the Optionee (or by the Optionee's guardian or personal representative in the event of the Optionee's incapacity). The Optionee may elect to designate a beneficiary by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company; such beneficiary may exercise the Optionee's Stock Option in the event of the Optionee's death to the extent provided herein. If the Optionee does not designate a beneficiary, or if the designated beneficiary predeceases the Optionee, the legal representative of the Optionee may exercise this Stock Option to the extent provided herein in the event of the Optionee's death.

5. Restrictions on Transfer of Option Shares. The Option Shares acquired upon exercise of the Stock Option shall be subject to certain transfer restrictions and other limitations including, without limitation, the provisions contained in Section 9 of the Plan.

6. Miscellaneous Provisions.

(a) Equitable Relief. The parties hereto agree and declare that legal remedies may be inadequate to enforce the provisions of this Agreement and that equitable relief, including specific performance and injunctive relief, may be used to enforce the provisions of this Agreement.

(b) Adjustments for Changes in Capital Structure. If, as a result of any reorganization, recapitalization, reincorporation, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Common Stock, the outstanding shares of Common Stock are increased or decreased or are exchanged for a different number or kind of shares of the Company's stock, the restrictions contained in this Agreement shall apply with equal force to additional and/or substitute securities, if any, received by the Optionee in exchange for, or by virtue of his or her ownership of, Option Shares.

(c) Change and Modifications. This Agreement may not be orally changed, modified or terminated, nor shall any oral waiver of any of its terms be effective. This Agreement may be changed, modified or terminated only by an agreement in writing signed by the Company and the Optionee.

(d) Governing Law. This Agreement shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

(e) Headings. The headings are intended only for convenience in finding the subject matter and do not constitute part of the text of this Agreement and shall not be considered in the interpretation of this Agreement.

(f) Saving Clause. If any provision(s) of this Agreement shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

(g) Notices. All notices, requests, consents and other communications shall be in writing and be deemed given when delivered personally, by telex or facsimile transmission or when received if mailed by first class registered or certified mail, postage prepaid. Notices to the Company or the Optionee shall be addressed as set forth underneath their signatures below, or to such other address or addresses as may have been furnished by such party in writing to the other.

(h) Benefit and Binding Effect. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, their respective successors, permitted assigns, and legal representatives. The Company has the right to assign this Agreement, and such assignee shall become entitled to all the rights of the Company hereunder to the extent of such assignment.

(i) Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

7. Dispute Resolution.

(a) Except as provided below, any dispute arising out of or relating to the Plan or this Stock Option, this Agreement, or the breach, termination or validity of the Plan, this Stock Option or this Agreement, shall be finally settled by binding arbitration conducted expeditiously in accordance with the J.A.M.S./Endispute Comprehensive Arbitration Rules and Procedures (the "J.A.M.S. Rules"). The arbitration shall be governed by the United States Arbitration Act, 9 U.S.C. Sections 1 16, and judgment upon the award rendered by the arbitrators may be entered by any court having jurisdiction thereof. The place of arbitration shall be Boston, Massachusetts.

(b) The arbitration shall commence within 60 days of the date on which a written demand for arbitration is filed by any party hereto. In connection with the arbitration proceeding, the arbitrator shall have the power to order the production of documents by each party and any third-party witnesses. In addition, each party may take up to three depositions as of right, and the arbitrator may in his or her discretion allow additional depositions upon good cause shown by the moving party. However, the arbitrator shall not have the power to order the answering of interrogatories or the response to requests for admission. In connection with any arbitration, each party to the arbitration shall provide to the other, no later than seven business days before the date of the arbitration, the identity of all persons that may testify at the arbitration and a copy of all documents that may be introduced at the arbitration or considered or used by a party's witness or expert. The arbitrator's decision and award shall be made and delivered within six months of the selection of the arbitrator. The arbitrator's decision shall set forth a reasoned basis for any award of damages or finding of liability. The arbitrator shall not have power to award damages in excess of actual compensatory damages and shall not multiply actual damages or award punitive damages, and each party hereby irrevocably waives any claim to such damages.

(c) The Company, the Optionee, each party to the Agreement and any other holder of Stock issued pursuant to this Agreement (each, a "Party") covenants and agrees that such party will participate in the arbitration in good faith. This Section 7 applies equally to requests for temporary, preliminary or permanent injunctive relief, except that in the case of temporary or preliminary injunctive relief any party may proceed in court without prior arbitration for the limited purpose of avoiding immediate and irreparable harm.

(d) Each Party (i) hereby irrevocably submits to the jurisdiction of any United States District Court of competent jurisdiction for the purpose of enforcing the award or decision in any such proceeding, (ii) hereby waives, and agrees not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above named courts, that its property is exempt or immune from attachment or execution (except as protected by applicable law), that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court, and (iii) hereby waives and agrees not to seek any review by any court of any other jurisdiction which may be called upon to grant an enforcement of the judgment of any such court. Each Party hereby consents to service of process by registered mail at the address to which notices are to be given. Each Party agrees that its, his or her submission to jurisdiction and its, his or her consent to service of process by mail is made for the express benefit of each other Party. Final judgment against any Party in any such action, suit or proceeding may be enforced in other jurisdictions by suit, action or proceeding on the judgment, or in any other manner provided by or pursuant to the laws of such other jurisdiction.

[SIGNATURE PAGE FOLLOWS]

The foregoing Agreement is hereby accepted and the terms and conditions thereof hereby agreed to by the undersigned as of the date first above written.

RAPID MICRO BIOSYSTEMS, INC.

By: _____
Name:
Title:

Address: 1001 Pawtucket Blvd West
Lowell, MA 01854

Optionee acknowledges receiving and reviewing a copy of the Plan, including, without limitation, Section 9 thereof, and understands that the Stock Option granted hereby is subject to the terms of the Plan and of this Agreement. By his or her electronic acceptance of the Stock Option, Optionee agrees to the terms and conditions of the Plan and this Agreement, SPECIFICALLY INCLUDING THE ARBITRATION PROVISIONS IN SECTION 7 OF THIS AGREEMENT.

_____

[SPOUSE'S CONSENT[1]
I acknowledge that I have read the foregoing Non-Qualified Stock Option Agreement and understand the contents thereof.

_____]

[1] A spouse's consent is required only if the Optionee's state of residence is one of the following community property states: Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, Washington and Wisconsin.

DESIGNATED BENEFICIARY:

Beneficiary's Address:

Appendix A

STOCK OPTION EXERCISE NOTICE

Rapid Micro Biosystems, Inc.
Attention: Chief Financial Officer
1001 Pawtucket Blvd West
Lowell, MA 01854

Pursuant to the terms of the stock option agreement between the undersigned and Rapid Micro Biosystems, Inc. (the "Company") dated _____ (the "Agreement") under the Rapid Micro Biosystems, Inc. 2010 Stock Option and Grant Plan, I, [Insert Name] _____, hereby [Circle One] partially/fully exercise such option by including herein payment in the amount of $_____ representing the purchase price for [Fill in number of Underlying Shares] _____ Underlying Shares. I have chosen the following form(s) of payment:

[ ] 1. Cash
[ ] 2. Certified or bank check payable to Rapid Micro Biosystems, Inc.
[ ] 3. Other (as referenced in the Agreement and described in the Plan (please describe))
_____.

In connection with my exercise of the option as set forth above, I hereby represent and warrant to the Company as follows:

(i) I am purchasing the Underlying Shares for my own account for investment only, and not for resale or with a view to the distribution thereof.

(ii) I have had such an opportunity as I have deemed adequate to obtain from the Company such information as is necessary to permit me to evaluate the merits and risks of my investment in the Company and have consulted with my own advisers with respect to my investment in the Company.

(iii) I have sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Underlying Shares and to make an informed investment decision with respect to such purchase.

(iv) I can afford a complete loss of the value of the Option Shares and am able to bear the economic risk of holding such Option Shares for an indefinite period of time.

(v) I understand that the Option Shares may not be registered under the Securities Act of 1933 (it being understood that the Option Shares are being issued and sold in reliance on the exemption provided in Rule 701 thereunder) or any applicable state securities or "blue sky" laws and may not be sold or otherwise transferred or disposed of in the absence of an effective registration statement under the Securities Act of 1933 and under any applicable state securities or "blue sky" laws (or exemptions from the registration requirement thereof). I further acknowledge that certificates representing Option Shares will bear restrictive legends reflecting the foregoing and/or that book entries for uncertificated Option Shares will include similar restrictive notations.

Sincerely yours,

_____

Name:

Address:

_____

_____

_____

RESTRICTED STOCK AGREEMENT
UNDER THE RAPID MICRO BIOSYSTEMS, INC.
2010 STOCK OPTION AND GRANT PLAN

Name of Grantee:	As set forth in the grant summary (the "Grant Summary") on the website to which this agreement is associated (the "Grantee")
No. of Shares:	As set forth in the Grant Summary (the "Shares")
Grant Date:	As set forth in the Grant Summary
Vesting Commencement Date:	As set forth in the Grant Summary (the "Vesting Commencement Date")
Per Share Purchase Price:	As set forth in the Grant Summary (the "Per Share Purchase Price")

Pursuant to the Rapid Micro Biosystems, Inc. 2010 Stock Option and Grant Plan (the "Plan"), Rapid Micro Biosystems, Inc., a Delaware corporation (together with any successor entity, the "Company"), hereby grants, sells and issues to the individual named above, who serves as an officer, employee, director, or other key person of the Company or any of the Subsidiaries, the Shares at the Per Share Purchase Price, subject to the terms and conditions set forth herein and in the Plan. The Grantee agrees to the provisions set forth herein and acknowledges that each such provision is a material condition of the Company's agreement to issue and sell the Shares to him or her. The Company hereby acknowledges receipt of the aggregate purchase price in full payment for the Shares. All references to share prices and amounts herein shall be equitably adjusted to reflect stock splits, stock dividends, recapitalizations, mergers, reorganizations and similar changes affecting the capital stock of the Company, and any shares of capital stock of the Company received on or in respect of Shares in connection with any such event (including any shares of capital stock or any right, option or warrant to receive the same or any security convertible into or exchangeable for any such shares or received upon conversion of any such shares) shall be subject to this Agreement on the same basis and extent at the relevant time as the Shares in respect of which they were issued, and shall be deemed Shares as if and to the same extent they were issued at the date hereof.

All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Plan.

1. Purchase and Sale of Shares; Vesting; Investment Representations.

(a) Purchase and Sale. On the date hereof, the Company hereby sells to the Grantee, and the Grantee hereby purchases from the Company, the number of Shares set forth above for the Per Share Purchase Price.

(b) Vesting . On the date of this Agreement, all of the Shares are non-transferable and subject to a substantial risk of forfeiture and are Shares of Restricted Stock. Subject to the determination of the Committee in its sole discretion to accelerate the vesting schedule hereunder, the risk of forfeiture shall lapse with respect to the Shares and such Shares shall become vested as set forth in the Grant Summary. Notwithstanding anything herein to the contrary in the case of a Sale Event, the Shares of Restricted Stock shall be treated as provided in Section 3(c) of the Plan.

(c) Investment Representations. In connection with the purchase and sale of the Shares contemplated by Section 1(a) above, the Grantee hereby represents and warrants to the Company as follows:

(i) The Grantee is purchasing the Shares for the Grantee's own account for investment only, and not for resale or with a view to the distribution thereof.

(ii) The Grantee has had such an opportunity as he or she has deemed adequate to obtain from the Company such information as is necessary to permit him or her to evaluate the merits and risks of the Grantee's investment in the Company and has consulted with the Grantee's own advisers with respect to the Grantee's investment in the Company.

(iii) The Grantee has sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

(iv) The Grantee can afford a complete loss of the value of the Shares and is able to bear the economic risk of holding such Shares for an indefinite period.

(v) The Grantee understands that the Shares are not registered under the Act (it being understood that the Shares are being issued and sold in reliance on the exemption provided in Rule 701 thereunder) or any applicable state securities or "blue sky" laws and may not be sold or otherwise transferred or disposed of in the absence of an effective registration statement under the Act and under any applicable state securities or "blue sky" laws (or exemptions from the registration requirements thereof). The Grantee further acknowledges that certificates representing the Shares will bear restrictive legends reflecting the foregoing and/or that book entries for uncertificated Shares will include similar restrictive notations.

2. Repurchase Right. Upon a Termination Event or other Repurchase Event, the Company shall have the right to repurchase the Shares as set forth in Section 9(c) of the Plan.

3. Restrictions on Transfer of Shares. The Shares (whether or not vested) shall be subject to certain transfer restrictions and other limitations including, without limitation, the provisions contained in Section 9 of the Plan.

4. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Restricted Stock Award shall be subject to and governed by all the terms and conditions of the Plan.

5. Miscellaneous Provisions.

(a) Record Owner; Dividends. The Grantee and any Permitted Transferees, during the duration of this Agreement, shall be considered the record owners of and shall be entitled to vote the Shares if and to the extent the Shares are entitled to voting rights. The Grantee and any Permitted Transferees shall be entitled to receive all dividends and any other distributions declared on the Shares; provided, however, that the Company is under no duty to declare any such dividends or to make any such distribution.

(b) Section 83(b) Election. The Grantee shall consult with the Grantee's tax advisor to determine whether it would be appropriate for the Grantee to make an election under Section 83(b) of the Code with respect to this Award. Any such election must be filed with the Internal Revenue Service within 30 days of the date of this Award. If the Grantee makes an election under Section 83(b) of the Code, the Grantee shall give prompt notice to the Company (and provide a copy of such election to the Company).

(c) Equitable Relief. The parties hereto agree and declare that legal remedies are inadequate to enforce the provisions of this Agreement and that equitable relief, including specific performance and injunctive relief, may be used to enforce the provisions of this Agreement.

(d) Change and Modifications. This Agreement may not be orally changed, modified or terminated, nor shall any oral waiver of any of its terms be effective. This Agreement may be changed, modified or terminated only by an agreement in writing signed by the Company and the Grantee.

(e) Governing Law . This Agreement shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

(f) Headings. The headings are intended only for convenience in finding the subject matter and do not constitute part of the text of this Agreement and shall not be considered in the interpretation of this Agreement.

(g) Saving Clause. If any provision(s) of this Agreement shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

(h) Notices. All notices, requests, consents and other communications shall be in writing and be deemed given when delivered personally, by telex or facsimile transmission or when received if mailed by first class registered or certified mail, postage prepaid. Notices to the Company or the Grantee shall be addressed as set forth underneath their signatures below, or to such other address or addresses as may have been furnished by such party in writing to the other. Notices to any holder of the Shares other than the Grantee shall be addressed to the address furnished by such holder to the Company.

(i) Benefit and Binding Effect. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, their respective successors, assigns, and legal representatives. The Company has the right to assign this Agreement, and such assignee shall become entitled to all the rights of the Company hereunder to the extent of such assignment.

(j) Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

6. Dispute Resolution .

(a) Except as provided below, any dispute arising out of or relating to the Plan or the Shares, this Agreement, or the breach, termination or validity of the Plan, the Shares or this Agreement, shall be finally settled by binding arbitration conducted expeditiously in accordance with the J.A.M.S./Endispute Comprehensive Arbitration Rules and Procedures (the "J.A.M.S. Rules"). The arbitration shall be governed by the United States Arbitration Act, 9 U.S.C. Sections 1 16, and judgment upon the award rendered by the arbitrators may be entered by any court having jurisdiction thereof. The place of arbitration shall be Boston, Massachusetts.

(b) The arbitration shall commence within 60 days of the date on which a written demand for arbitration is filed by any party hereto. In connection with the arbitration proceeding, the arbitrator shall have the power to order the production of documents by each party and any third-party witnesses. In addition, each party may take up to three depositions as of right, and the arbitrator may in his or her discretion allow additional depositions upon good cause shown by the moving party. However, the arbitrator shall not have the power to order the answering of interrogatories or the response to requests for admission. In connection with any arbitration, each party to the arbitration shall provide to the other, no later than seven business days before the date of the arbitration, the identity of all persons that may testify at the arbitration and a copy of all documents that may be introduced at the arbitration or considered or used by a party's witness or expert. The arbitrator's decision and award shall be made and delivered within six months of the selection of the arbitrator. The arbitrator's decision shall set forth a reasoned basis for any award of damages or finding of liability. The arbitrator shall not have power to award damages in excess of actual compensatory damages and shall not multiply actual damages or award punitive damages, and each party hereby irrevocably waives any claim to such damages.

(c) The Company, the Grantee, each party to the Agreement and any other holder of Shares or Stock issued pursuant to this Agreement (each, a "Party") covenants and agrees that such party will participate in the arbitration in good faith. This Section 6 applies equally to requests for temporary, preliminary or permanent injunctive relief, except that in the case of temporary or preliminary injunctive relief any party may proceed in court without prior arbitration for the limited purpose of avoiding immediate and irreparable harm.

(d) Each Party (i) hereby irrevocably submits to the jurisdiction of any United States District Court of competent jurisdiction for the purpose of enforcing the award or decision in any such proceeding, (ii) hereby waives, and agrees not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above named courts, that its property is exempt or immune from attachment or execution (except as protected by applicable law), that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court, and (iii) hereby waives and agrees not to seek any review by any court of any other jurisdiction which may be called upon to grant an enforcement of the judgment of any such court. Each Party hereby consents to service of process by registered mail at the address to which notices are to be given. Each Party agrees that its, his or her submission to jurisdiction and its, his or her consent to service of process by mail is made for the express benefit of each other Party. Final judgment against any Party in any such action, suit or proceeding may be enforced in other jurisdictions by suit, action or proceeding on the judgment, or in any other manner provided by or pursuant to the laws of such other jurisdiction.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the Company and the Grantee have executed this Restricted Stock Agreement as of the date first above written.

RAPID MICRO BIOSYSTEMS, INC.

By: _____
Name:
Title:

Address: 1001 Pawtucket Blvd West
Lowell, MA 01854

Grantee acknowledges receiving and reviewing a copy of the Plan, including, without limitation, Section 9 thereof and understands that the Shares granted hereby are subject to the terms of the Plan and of this Agreement. By his or her electronic acceptance of the Shares, Grantee agrees to the terms and conditions of the Plan and this Agreement, SPECIFICALLY INCLUDING THE ARBITRATION PROVISIONS IN SECTION 6 OF THIS AGREEMENT.

[SPOUSE'S CONSENT[1]
I acknowledge that I have read the foregoing Restricted Stock Agreement and understand the contents thereof.
_____]

[1] A spouse's consent is required only if the Grantee's state of residence is one of the following community property states: Arizona, California, Idaho, Louisiana, New Mexico, Nevada, Texas, Washington and Wisconsin.

Exhibit 10.5

Execution Version

RAPID MICRO BIOSYSTEMS, INC.

SEVENTH AMENDED AND RESTATED
INVESTORS' RIGHTS AGREEMENT

March 9, 2021

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Schedule A - Schedule of Investors
Schedule B - Schedule of Key Holders

SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

THIS SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT (this "**Agreement**") is made as of the 9th day of March, 2021 by and among Rapid Micro Biosystems, Inc., a Delaware corporation (the "**Company**"), each of the investors listed on Schedule A hereto, each of which is referred to in this Agreement as an "**Investor**," each of the stockholders listed on Schedule B hereto, each of whom is referred to herein as a "**Key Holder**" and any additional purchaser that becomes a party to this Agreement in accordance with Section 6.9 hereof.

RECITALS

WHEREAS, certain of the Investors (the "**Existing Investors**") possess registration rights, information rights, rights of first offer, and other rights pursuant to a Sixth Amended and Restated Investors' Rights Agreement dated as of April 28, 2020, between the Company and the other parties thereto (the "**Prior Agreement**");

WHEREAS, the Existing Investors represent the Requisite Holders (as defined in the Prior Agreement) and desire to amend and restate the Prior Agreement in its entirety and to accept the rights created pursuant to this Agreement in lieu of the rights granted to them under the Prior Agreement; and

WHEREAS, certain of the Investors are parties to that certain Series D1/D2 Preferred Stock Purchase Agreement dated as of the date hereof, between the Company and such Investors (the "**Purchase Agreement**"), under which certain of the Company's and such Investors' obligations are conditioned upon the execution and delivery of this Agreement by such Investors and the Requisite Holders (as defined in the Prior Agreement).

NOW, THEREFORE, the Existing Investors hereby agree that the Prior Agreement shall be amended and restated in its entirety, and the parties to this Agreement further agree as follows:

1. Definitions. For purposes of this Agreement:

1.1 "**Affiliate**" means, with respect to any specified Person, any other Person who, directly or indirectly, controls, is controlled by, or is under common control with such Person, including without limitation any general partner, managing member, officer or director of such Person or any venture capital fund or other investment fund now or hereafter existing that is controlled by one or more general partners or managing members of, or shares the same management company or investment adviser with, such Person.

1.2 "**Common Stock**" means shares of the Company's Common Stock, par value $0.01 per share.

1.3 "**Convertible Securities**" means any evidences of indebtedness, shares or other securities directly or indirectly convertible into or exchangeable for Common Stock, but excluding Options.

1.4 "**Damages**" means any loss, damage, or liability (joint or several) to which a party hereto may become subject under the Securities Act, the Exchange Act, or other federal or state law, insofar as such loss, damage, or liability (or any action in respect thereof) arises out of or is based upon (i) any untrue statement or alleged untrue statement of a material fact contained in any registration statement of the Company, including any preliminary prospectus or final prospectus contained therein or any amendments or supplements thereto; (ii) an omission or alleged omission to state therein a material fact required to be stated therein, or necessary to make the statements therein not misleading; or (iii) any violation or alleged violation by the indemnifying party (or any of its agents or Affiliates) of the Securities Act, the Exchange Act, any state securities law, or any rule or regulation promulgated under the Securities Act, the Exchange Act, or any state securities law.

1.5 "**Derivative Securities**" means any securities or rights convertible into, or exercisable or exchangeable for (in each case, directly or indirectly), Common Stock, including options and warrants.

1.6 "**Exchange Act**" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

1.7 "**Excluded Registration**" means (i) a registration relating-to the sale of securities to employees of the Company or a subsidiary pursuant to a stock option, stock purchase, or similar plan; (ii) a registration relating to an SEC Rule 145 transaction; (iii) a registration on any form that does not include substantially the same information as would be required to be included in a registration statement covering the sale of the Registrable Securities; (iv) a registration relating to the IPO or a SPAC Transaction or (v) a registration in which the only Common Stock being registered is Common Stock issuable upon conversion of debt securities that are also being registered.

1.8 "**Form S-1**" means such form under the Securities Act as in effect on the date hereof or any successor registration form under the Securities Act subsequently adopted by the SEC.

1.9 "**Form S-3**" means such form under the Securities Act as in effect on the date hereof or any registration form under the Securities Act subsequently adopted by the SEC that permits incorporation of substantial information by reference to other documents filed by the Company with the SEC.

1.10 "**GAAP**" means generally accepted accounting principles in the United States.

1.11 "**Holder**" means any holder of Registrable Securities who is a party to this Agreement.

1.12 "**Immediate Family Member**" means a child, stepchild, grandchild, parent, stepparent, grandparent, spouse, sibling, mother-in-law, father-in-law, son-in-law, daughter-in-law, brother-in-law, or sister-in-law, including adoptive relationships, of a natural person referred to herein.

1.13 "**Initiating Holders**" means, collectively, Holders who properly initiate a registration request under this Agreement.

1.14 "**IPO**" means the Company's first underwritten public offering of its Common Stock under the Securities Act.

1.15 "**Key Employee**" means any executive-level employee (including division director and vice president-level positions) as well as any employee or consultant who, either alone or in concert with others, develops, invents, programs, or designs any material intellectual property owned or held for use by the Company.

1.16 "**Key Holder Registrable Securities**" means (i) the shares of Common Stock acquired prior to the earlier of (A) the IPO or (B) a SPAC Transaction and held by the Key Holders, and (ii) any Common Stock issued as (or issuable upon the conversion or exercise of any warrant, right, or other security that is issued as) a dividend or other distribution with respect to, or in exchange for or in replacement of such shares.

1.17 "**Major Holder**" means (i) with respect to any Investor, any Investor that, individually or together with such Investor's Affiliates, holds at least 500,000 Registrable Securities (as adjusted for any stock split, stock dividend, combination, or other recapitalization or reclassification effected after the date hereof), excluding shares of Common Stock issued to such Investor in connection with the July 24, 2017 conversion of all then-outstanding shares of the Company's preferred stock into Common Stock, and (ii) with respect to any Key Holder (other than Straus Holdings, Inc. for purpose of Section 3 hereof), any Key Holder that, individually or together with such Key Holder's Affiliates, holds at least 884 shares of Key Holder Registrable Securities (as adjusted for any stock split, stock dividend, combination, or other recapitalization or reclassification effected after the date hereof).

1.18 "**New Securities**" means, collectively, equity securities of the Company, whether or not currently authorized, as well as rights, options, or warrants to purchase such equity securities, or securities of any type whatsoever that are, or may become, convertible or exchangeable into or exercisable for such equity securities.

1.19 "**Option**" shall mean rights, options or warrants to subscribe for, purchase or otherwise acquire Common Stock or Convertible Securities.

1.20 "**Person**" means any individual, corporation, partnership, trust, limited liability company, association or other entity.

1.21 "**Preferred Stock**" means, collectively, all shares of Series A1 Preferred Stock, Series B1 Preferred Stock, Series C1 Preferred Stock, Series C2 Preferred Stock, Series D1 Preferred Stock and Series D2 Preferred Stock.

1.22 "**Qualified Public Offering**" shall have the meaning given to such term in the Restated Certificate.

1.23 "**Registrable Securities**" means (i) the Common Stock issuable or issued upon conversion of the Preferred Stock (including, without limitation, Preferred Stock issuable or issued upon exercise of any warrants to purchase Preferred Stock); (ii) any Common Stock, or any Common Stock issued or issuable (directly or indirectly) upon conversion and/or exercise of any other securities of the Company, held by the Investors as of the date hereof or acquired by the Investors after the date hereof and prior to the earlier of (A) the IPO or (B) a SPAC Transaction; (iii) the Key Holder Registrable Securities, provided, however, that such Key Holder Registrable Securities shall not be deemed Registrable Securities and the Key Holders shall not be deemed Holders for the purposes of Section 2.10; and (iv) any Common Stock issued as (or issuable upon the conversion or exercise of any warrant, right, or other security that is issued as) a dividend or other distribution with respect to, or in exchange for or in replacement of, the shares referenced in clauses (i) and (ii) above; excluding, however, (a) any Registrable Securities sold by a Person in a transaction in which the applicable rights under this Agreement are not assigned pursuant to Section 6.1, and (b) for purposes of Section 2 (and following the earlier of (A) the IPO or (B) a SPAC Transaction, for all purposes under this Agreement) any shares for which registration rights have terminated pursuant to Section 2.13 of this Agreement.

1.24 "**Registrable Securities then outstanding**" means the number of shares determined by adding the number of shares of outstanding Common Stock that are Registrable Securities and the number of shares of Common Stock issuable (directly or indirectly) pursuant to then exercisable and/or convertible securities that are Registrable Securities.

1.25 "**Requisite Directors**" shall mean a majority of the Preferred Directors (as defined in the Restated Certificate).

1.26 "**Requisite Holders**" shall mean the Investors holding a majority of the shares of Common Stock issued or issuable upon conversion of the shares of Preferred Stock held by the Investors (voting together as a single class (on an-as-converted basis) and in accordance with the provisions of the Restated Certificate (including the Series C2/D2 Voting Restriction (as defined in the Restated Certificate), unless otherwise specified). For purposes of clarity, no shares of Series C2 Preferred Stock or Series D2 Preferred Stock held by any Investors shall be counted for purposes of the foregoing definition until and unless a Restriction Removal Event has occurred (as such term is used in the Restated Certificate).

1.27 "**Restated Certificate**" shall mean the Company's Eighth Amended and Restated Certificate of Incorporation, as may be amended and/or restated from time to time.

1.28 "**Restricted Securities**" means the securities of the Company required to bear the legend set forth in Section 2.12(b) hereof.

1.29 "**Right of First Refusal and Co-Sale Agreement**" means the Seventh Amended and Restated Right of First Refusal and Co-Sale Agreement, dated as of the date hereof, by and among the Company and the other parties thereto, as may be amended and/or restated from time to time.

1.30 "**SEC**" means the Securities and Exchange Commission.

1.31 "**SEC Rule 144**" means Rule 144 promulgated by the SEC under the Securities Act.

1.32 "**SEC Rule 145**" means Rule 145 promulgated by the SEC under the Securities Act.

1.33 "**Securities Act**" means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

1.34 "**Selling Expenses**" means all underwriting discounts, selling commissions, and stock transfer taxes applicable to the sale of Registrable Securities, and fees and disbursements of counsel for any Holder, except for the fees and disbursements of the Selling Holder Counsel borne and paid by the Company as provided in Section 2.6.

1.35 "**Series A1 Preferred Stock**" means shares of the Company's Series A1 Preferred Stock, par value $0.01 per share.

1.36 "**Series B1 Preferred Stock**" means shares of the Company's Series B1 Preferred Stock, par value $0.01 per share.

1.37 "**Series C1 Preferred Stock**" means shares of the Company's Series C1 Preferred Stock, par value $0.01 per share.

1.38 "**Series C2 Preferred Stock**" means shares of the Company's Series C2 Preferred Stock, par value $0.01 per share.

1.39 "**Series D1 Preferred Stock**" means shares of the Company's Series D1 Preferred Stock, par value $0.01 per share.

1.40 "**Series D2 Preferred Stock**" means shares of the Company's Series D2 Preferred Stock, par value $0.01 per share.

1.41 "**SPAC**" means a publicly-traded special purpose acquisition company.

1.42 "**SPAC Transaction**" means a transaction or series of related transactions by merger, consolidation, share exchange or otherwise, of the Company with a SPAC or a subsidiary or affiliate thereof.

1.43 "**Voting Agreement**" means the Seventh Amended and Restated Voting Agreement, dated as of the date hereof, by and among the Company and the other parties thereto, as may be amended and/or restated from time to time.

2. Registration Rights. The Company covenants and agrees as follows:

2.1 Demand Registration.

(a) Form S-1 Demand. If at any time after the earlier of (i) three (3) years after the date hereof or (ii) one hundred eighty (180) days after the effective date of the registration statement for the earlier of (A) the IPO or (B) a SPAC Transaction, the Company receives a request from Holders of a majority of the Registrable Securities then outstanding that the Company file a Form S-1 registration statement with respect to Registrable Securities having an anticipated aggregate offering price of at least $50 million, then the Company shall (A) within ten (10) days after the date such request is given, give notice thereof (the "**Demand Notice**") to all Holders other than the Initiating Holders; and (B) as soon as practicable, and in any event within sixty (60) days after the date such request is given by the Initiating Holders, file a Form S-1 registration statement under the Securities Act covering all Registrable Securities that the Initiating Holders requested to be registered and any additional Registrable Securities requested to be included in such registration by any other Holders, as specified by notice given by each such Holder to the Company within twenty (20) days of the date the Demand Notice is given, and in each case, subject to the limitations of Section 2.1(c) and Section 2.3.

(b) Form S-3 Demand. If at any time when it is eligible to use a Form S-3 registration statement, the Company receives a request from Holders of at least twenty percent (20%) of the Registrable Securities then outstanding that the Company file a Form S-3 registration statement with respect to outstanding Registrable Securities of such Holders having an anticipated aggregate offering price of at least $3 million, then the Company shall (i) within ten (10) days after the date such request is given, give a Demand Notice to all Holders other than the Initiating Holders; and (ii) as soon as practicable, and in any event within forty-five (45) days after the date such request is given by the Initiating Holders, file a Form S-3 registration statement under the Securities Act covering all Registrable Securities requested to be included in such registration by any other Holders, as specified by notice given by each such Holder to the Company within twenty (20) days of the date the Demand Notice is given, and in each case, subject to the limitations of Section 2.1(c) and Section 2.3.

(c) Notwithstanding the foregoing obligations, if the Company furnishes to Holders requesting a registration pursuant to this Section 2.1 a certificate signed by the Company's chief executive officer stating that in the good faith judgment of the Company's Board of Directors (the "**Board**") it would be materially detrimental to the Company and its stockholders for such registration statement to be filed and it is therefore necessary to defer the filing of such registration statement because such action would (i) materially interfere with a significant acquisition, corporate reorganization, or other similar transaction involving the Company; (ii) require premature disclosure of material information that the Company has a bona fide business purpose for preserving as confidential; or (iii) render the Company unable to comply with requirements under the Securities Act or Exchange Act, then the Company shall have the right to defer taking action with respect to such filing, and any time periods with respect to filing or effectiveness thereof shall be tolled correspondingly, for a period of not more than ninety (90) days after the request of the Initiating Holders is given; provided, however, that the Company may not invoke this right more than once in any twelve (12) month period; and provided further, that the Company shall not register any securities for its own account or that of any other stockholder during such ninety (90) day period other than an Excluded Registration.

(d) The Company shall not be obligated to effect, or to take any action to effect, any registration pursuant to Section 2.1(a) (i) during the period that is sixty (60) days before the Company's good faith estimate of the date of filing of, and ending on a date that is one hundred eighty (180) days after the effective date of, a Company-initiated registration, provided, that the Company is actively employing in good faith commercially reasonable efforts to cause such registration statement to become effective; (ii) after the Company has effected two registrations pursuant to Section 2.1(a); or (iii) if the Initiating Holders propose to dispose of shares of Registrable Securities that may be immediately registered on Form S-3 pursuant to a request made pursuant to Section 2.1(b). The Company shall not be obligated to effect, or to take any action to effect, any registration pursuant to Section 2.1(b) (x) during the period that is thirty (30) days before the Company's good faith estimate of the date of filing of, and ending on a date that is ninety (90) days after the effective date of, a Company-initiated registration, provided, that the Company is actively employing in good faith commercially reasonable efforts to cause such registration statement to become effective; or (y) if the Company has effected two registrations pursuant to Section 2.1(b) within the twelve (12) month period immediately preceding the date of such request. A registration shall not be counted as "effected" for purposes of this Section 2.1(d) until such time as the applicable registration statement has been declared effective by the SEC, unless the Initiating Holders withdraw their request for such registration, elect not to pay the registration expenses therefor, and forfeit their right to one demand registration statement pursuant to Section 2.6, in which case such withdrawn registration statement shall be counted as "effected" for purposes of this Section 2.1(d).

2.2 Company Registration. If the Company proposes to register (including, for this purpose, a registration effected by the Company for stockholders other than the Holders) any of its securities under the Securities Act in connection with the public offering of such securities solely for cash (other than in an Excluded Registration), the Company shall, at such time, promptly give each Holder notice of such registration. Upon the request of each Holder given within twenty (20) days after such notice is given by the Company, the Company shall, subject to the provisions of Section 2.3, cause to be registered all of the Registrable Securities that each such Holder has requested to be included in such registration. The Company shall have the right to terminate or withdraw any registration initiated by it under this Section 2.2 before the effective date of such registration, whether or not any Holder has elected to include Registrable Securities in such registration. The expenses (other than Selling Expenses) of such withdrawn registration shall be borne by the Company in accordance with Section 2.6.

2.3 Underwriting Requirements.

(a) If, pursuant to Section 2.1, the Initiating Holders intend to distribute the Registrable Securities covered by their request by means of an underwriting, they shall so advise the Company as a part of their request made pursuant to Section 2.1, and the Company shall include such information in the Demand Notice. The underwriter(s) will be selected by the Company and shall be reasonably acceptable to a majority in interest of the Initiating Holders. In such event, the right of any Holder to include such Holder's Registrable Securities in such registration shall be conditioned upon such Holder's participation in such underwriting and the inclusion of such Holder's Registrable Securities in the underwriting to the extent provided herein. All Holders proposing to distribute their securities through such underwriting shall (together with the Company as provided in Section 2.4(e)) enter into an underwriting agreement in customary form with the underwriter(s) selected for such underwriting. Notwithstanding any other provision of this Section 2.3, if the managing underwriter(s) advise(s) the Initiating Holders in writing that marketing factors require a limitation on the number of shares to be underwritten, then the Initiating Holders shall so advise all Holders of Registrable Securities that otherwise would be underwritten pursuant hereto, and the number of Registrable Securities that may be included in the underwriting shall be allocated among such Holders of Registrable Securities, including the Initiating Holders, in proportion (as nearly as practicable) to the number of Registrable Securities owned by each Holder or in such other proportion as shall mutually be agreed to by all such selling Holders; provided, however, that the number of Registrable Securities held by the Holders to be included in such underwriting shall not be reduced unless all other securities are first entirely excluded from the underwriting. To facilitate the allocation of shares in accordance with the above provisions, the Company or the underwriters may round the number of shares allocated to any Holder to the nearest 100 shares.

(b) In connection with any offering involving an underwriting of shares of the Company's capital stock pursuant to Section 2.2, the Company shall not be required to include any of the Holders' Registrable Securities in such underwriting unless the Holders accept the terms of the underwriting as agreed upon between the Company and its underwriters, and then only in such quantity as the underwriters in their sole discretion determine will not jeopardize the success of the offering by the Company. If the total number of securities, including Registrable Securities, requested by stockholders to be included in such offering exceeds the number of securities to be sold (other than by the Company) that the underwriters in their reasonable discretion determine is compatible with the success of the offering, then the Company shall be required to include in the offering only that number of such securities, including Registrable Securities, which the underwriters and the Company in their sole discretion determine will not jeopardize the success of the offering. If the underwriters determine that less than all of the Registrable Securities requested to be registered can be included in such offering, then the Registrable Securities that are included in such offering shall be allocated among the selling Holders in proportion (as nearly as practicable to) the number of Registrable Securities owned by each selling Holder or in such other proportions as shall mutually be agreed to by all such selling Holders. To facilitate the allocation of shares in accordance with the above provisions, the Company or the underwriters may round the number of shares allocated to any Holder to the nearest 100 shares. Notwithstanding the foregoing, in no event shall (i) the number of Registrable Securities included in the offering be reduced unless all other securities (other than securities to be sold by the Company) are first entirely excluded from the offering, or (ii) the number of Registrable Securities included in the offering be reduced below twenty percent (20%) of the total number of securities included in such offering, unless such offering is a Qualified Public Offering, in which case the selling Holders may be excluded further if the underwriters make the determination described above and no other stockholder's securities are included in such offering. For purposes of the provision in this Section 2.3(b) concerning apportionment, for any selling Holder that is a partnership, limited liability company, or corporation, the partners, members, retired partners, retired members, stockholders, and Affiliates of such Holder, or the estates and Immediate Family Members of any such partners, retired partners, members, and retired members and any trusts for the benefit of any of the foregoing Persons, shall be deemed to be a single "selling Holder," and any pro rata reduction with respect to such "selling Holder" shall be based upon the aggregate number of Registrable Securities owned by all Persons included in such "selling Holder," as defined in this sentence.

2.4 Obligations of the Company. Whenever required under this Section 2 to effect the registration of any Registrable Securities, the Company shall, as expeditiously as reasonably possible:

(a) prepare and file with the SEC a registration statement with respect to such Registrable Securities and use its commercially reasonable efforts to cause such registration statement to become effective and, upon the request of the Holders of a majority of the Registrable Securities registered thereunder, keep such registration statement effective for a period of up to one hundred twenty (120) days or, if earlier, until the distribution contemplated in the registration statement has been completed; provided, however, that (i) such one hundred twenty (120) day period shall be extended for a period of time equal to the period the Holder refrains, at the request of an underwriter of Common Stock (or other securities) of the Company, from selling any securities included in such registration, and (ii) in the case of any registration of Registrable Securities on Form S-3 that are intended to be offered on a continuous or delayed basis, subject to compliance with applicable SEC rules, such one hundred twenty (120) day period shall be extended for up to sixty (60) days, if necessary, to keep the registration statement effective until all such Registrable Securities are sold;

(b) prepare and file with the SEC such amendments and supplements to such registration statement, and the prospectus used in connection with such registration statement, as may be necessary to comply with the Securities Act in order to enable the disposition of all securities covered by such registration statement;

(c) furnish to the selling Holders such numbers of copies of a prospectus, including a preliminary prospectus, as required by the Securities Act, and such other documents as the Holders may reasonably request in order to facilitate their disposition of their Registrable Securities;

(d) use its commercially reasonable efforts to register and qualify the securities covered by such registration statement under such other securities or blue-sky laws of such jurisdictions as shall be reasonably requested by the selling Holders; provided that the Company shall not be required to qualify to do business or to file a general consent to service of process in any such states or jurisdictions, unless the Company is already subject to service in such jurisdiction and except as may be required by the Securities Act;

(e) in the event of any underwritten public offering, enter into and perform its obligations under an underwriting agreement, in usual and customary form, with the underwriter(s) of such offering;

(f) use its commercially reasonable efforts to cause all such Registrable Securities covered by such registration statement to be listed on a national securities exchange or trading system and each securities exchange and trading system (if any) on which similar securities issued by the Company are then listed;

(g) provide a transfer agent and registrar for all Registrable Securities registered pursuant to this Agreement and provide a CUSIP number for all such Registrable Securities, in each case not later than the effective date of such registration;

(h) promptly make available for inspection by the selling Holders, any managing underwriter(s) participating in any disposition pursuant to such registration statement, and any attorney or accountant or other agent retained by any such underwriter or selected by the selling Holders, all financial and other records, pertinent corporate documents, and properties of the Company, and cause the Company's officers, directors, employees, and independent accountants to supply all information reasonably requested by any such seller, underwriter, attorney, accountant, or agent, in each case, as necessary or advisable to verify the accuracy of the information in such registration statement and to conduct appropriate due diligence in connection therewith;

(i) notify each selling Holder, promptly after the Company receives notice thereof, of the time when such registration statement has been declared effective or a supplement to any prospectus forming a part of such registration statement has been filed; and

(j) after such registration statement becomes effective, notify each selling Holder of any request by the SEC that the Company amend or supplement such registration statement or prospectus.

2.5 Furnish Information. It shall be a condition precedent to the obligations of the Company to take any action pursuant to this Section 2 with respect to the Registrable Securities of any selling Holder that such Holder shall furnish to the Company such information regarding itself, the Registrable Securities held by it, and the intended method of disposition of such securities as is reasonably required to effect the registration of such Holder's Registrable Securities.

2.6 Expenses of Registration. All expenses (other than Selling Expenses) incurred in connection with registrations, filings, or qualifications pursuant to Section 2, including all registration, filing, and qualification fees; printers' and accounting fees; fees and disbursements of counsel for the Company; and the reasonable fees and disbursements, not to exceed $30,000 for each such registration, filing or qualification, of one counsel for the selling Holders ("**Selling Holder Counsel**"), shall be borne and paid by the Company; provided, however, that the Company shall not be required to pay for any expenses of any registration proceeding begun pursuant to Section 2.1 if the registration request is subsequently withdrawn at the request of the Holders of a majority of the Registrable Securities to be registered (in which case all selling Holders shall bear such expenses pro rata based upon the number of Registrable Securities that were to be included in the withdrawn registration), unless the Holders of a majority of the Registrable Securities then outstanding agree to forfeit their right to one registration pursuant to Section 2.1(a) or Section 2.1(b), as the case may be; provided further, that if, at the time of such withdrawal, the Holders shall have learned of a material adverse change in the condition, business, or prospects of the Company from that known to the Holders at the time of their request and have withdrawn the request with reasonable promptness after learning of such information then the Holders shall not be required to pay any such expenses and shall not forfeit their right to one registration pursuant to Section 2.1(a) or Section 2.1(b). All Selling Expenses relating to Registrable Securities registered pursuant to this Section 2 shall be borne and paid by the Holders pro rata on the basis of the number of Registrable Securities registered on their behalf.

2.7 Delay of Registration. No Holder shall have any right to obtain or seek an injunction restraining or otherwise delaying any registration pursuant to this Agreement as the result of any controversy that might arise with respect to the interpretation or implementation of this Section 2.

2.8 Indemnification. If any Registrable Securities are included in a registration statement under this Section 2:

(a) To the extent permitted by law, the Company will indemnify and hold harmless each selling Holder, and the partners, members, officers, directors, and stockholders of each such Holder; legal counsel and accountants for each such Holder; any underwriter (as defined in the Securities Act) for each such Holder; and each Person, if any, who controls such Holder or underwriter within the meaning of the Securities Act or the Exchange Act, against any Damages, and the Company will pay to each such Holder, underwriter, controlling Person, or other aforementioned Person any legal or other expenses reasonably incurred thereby in connection with investigating or defending any claim or proceeding from which Damages may result, as such expenses are incurred; provided, however, that the indemnity agreement contained in this Section 2.8(a) shall not apply to amounts paid in settlement of any such claim or proceeding if such settlement is effected without the consent of the Company, which consent shall not be unreasonably withheld, nor shall the Company be liable for any Damages to the extent that they arise out of or are based upon actions or omissions made in reliance upon and in conformity with written information furnished by or on behalf of any such Holder, underwriter, controlling Person, or other aforementioned Person expressly for use in connection with such registration.

(b) To the extent permitted by law, each selling Holder, severally and not jointly, will indemnify and hold harmless the Company, and each of its directors, each of its officers who has signed the registration statement, each Person (if any), who controls the Company within the meaning of the Securities Act, legal counsel and accountants for the Company, any underwriter (as defined in the Securities Act), any other Holder selling securities in such registration statement, and any controlling Person of any such underwriter or other Holder, against any Damages, in each case only to the extent that such Damages arise out of or are based upon actions or omissions made in reliance upon and in conformity with written information furnished by or on behalf of such selling Holder expressly for use in connection with such registration; and each such selling Holder will pay to the Company and each other aforementioned Person any legal or other expenses reasonably incurred thereby in connection with investigating or defending any claim or proceeding from which Damages may result, as such expenses are incurred; provided, however, that the indemnity agreement contained in this Section 2.8(b) shall not apply to amounts paid in settlement of any such claim or proceeding if such settlement is effected without the consent of the Holder, which consent shall not be unreasonably withheld; and provided further, that in no event shall the aggregate amounts payable by any Holder by way of indemnity or contribution under Sections 2.8(b) and 2.8(d) exceed the proceeds from the offering received by such Holder (net of any Selling Expenses paid by such Holder), except in the case of fraud or willful misconduct by such Holder.

(c) Promptly after receipt by an indemnified party under this Section 2.8 of notice of the commencement of any action (including any governmental action) for which a party may be entitled to indemnification hereunder, such indemnified party will, if a claim in respect thereof is to be made against any indemnifying party under this Section 2.8, give the indemnifying party notice of the commencement thereof. The indemnifying party shall have the right to participate in such action and, to the extent the indemnifying party so desires, participate jointly with any other indemnifying party to which notice has been given, and to assume the defense thereof with counsel mutually satisfactory to the parties; provided, however, that an indemnified party (together with all other indemnified parties that may be represented without conflict by one counsel) shall have the right to retain one separate counsel, with the fees and expenses to be paid by the indemnifying party, if representation of such indemnified party by the counsel retained by the indemnifying party would be inappropriate due to actual or potential differing interests between such indemnified party and any other party represented by such counsel in such action. The failure to give notice to the indemnifying party within a reasonable time of the commencement of any such action shall relieve such indemnifying party of any liability to the indemnified party under this Section 2.8, to the extent that such failure materially prejudices the indemnifying party's ability to defend such action. The failure to give notice to the indemnifying party will not relieve it of any liability that it may have to any indemnified party otherwise than under this Section 2.8.

(d) To provide for just and equitable contribution to joint liability under the Securities Act in any case in which either (i) any party otherwise entitled to indemnification hereunder makes a claim for indemnification pursuant to this Section 2.8 but it is judicially determined (by the entry of a final judgment or decree by a court of competent jurisdiction and the expiration of time to appeal or the denial of the last right of appeal) that such indemnification may not be enforced in such case, notwithstanding the fact that this Section 2.8 provides for indemnification in such case, or (ii) contribution under the Securities Act may be required on the part of any party hereto for which indemnification is provided under this Section 2.8, then, and in each such case, such parties will contribute to the aggregate losses, claims, damages, liabilities, or expenses to which they may be subject (after contribution from others) in such proportion as is appropriate to reflect the relative fault of each of the indemnifying party and the indemnified party in connection with the statements, omissions, or other actions that resulted in such loss, claim, damage, liability, or expense, as well as to reflect any other relevant equitable considerations. The relative fault of the indemnifying party and of the indemnified party shall be determined by reference to, among other things, whether the untrue or allegedly untrue statement of a material fact, or the omission or alleged omission of a material fact, relates to information supplied by the indemnifying party or by the indemnified party and the parties' relative intent, knowledge, access to information, and opportunity to correct or prevent such statement or omission; provided, however, that, in any such case, (i) no Holder will be required to contribute any amount in excess of the public offering price of all such Registrable Securities offered and sold by such Holder pursuant to such registration statement, and (ii) no Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) will be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation; and provided further, that in no event shall a Holder's liability pursuant to this Section 2.8(d), when combined with the amounts paid or payable by such Holder pursuant to Section 2.8(b), exceed the proceeds from the offering received by such Holder (net of any Selling Expenses paid by such Holder), except in the case of willful misconduct or fraud by such Holder.

(e) Notwithstanding the foregoing, to the extent that the provisions on indemnification and contribution contained in the underwriting agreement entered into in connection with the underwritten public offering are in conflict with the foregoing provisions, the provisions in the underwriting agreement shall control.

(f) Unless otherwise superseded by an underwriting agreement entered into in connection with the underwritten public offering, the obligations of the Company and Holders under this Section 2.8 shall survive the completion of any offering of Registrable Securities in a registration under this Section 2, and otherwise shall survive the termination of this Agreement.

2.9 Reports Under Exchange Act. With a view to making available to the Holders the benefits of SEC Rule 144 and any other rule or regulation of the SEC that may at any time permit a Holder to sell securities of the Company to the public without registration or pursuant to a registration on Form S-3, the Company shall:

(a) make and keep available adequate current public information, as those terms are understood and defined in SEC Rule 144, at all times after the effective date of the registration statement filed by the Company for the IPO;

(b) use commercially reasonable efforts to file with the SEC in a timely manner all reports and other documents required of the Company under the Securities Act and the Exchange Act (at any time after the Company has become subject to such reporting requirements); and

(c) furnish to any Holder, so long as the Holder owns any Registrable Securities, forthwith upon request (i) to the extent accurate, a written statement by the Company that it has complied with the reporting requirements of SEC Rule 144 (at any time after ninety (90) days after the effective date of the registration statement filed by the Company for the IPO), the Securities Act, and the Exchange Act (at any time after the Company has become subject to such reporting requirements), or that it qualifies as a registrant whose securities may be resold pursuant to Form S-3 (at any time after the Company so qualifies); (ii) a copy of the most recent annual or quarterly report of the Company and such other reports and documents so filed by the Company; and (iii) such other information as may be reasonably requested in availing any Holder of any rule or regulation of the SEC that permits the selling of any such securities without registration (at any time after the Company has become subject to the reporting requirements under the Exchange Act) or pursuant to Form S-3 (at any time after the Company so qualifies to use such form).

2.10 Limitations on Subsequent Registration Rights. From and after the date of this Agreement, the Company shall not, without the prior written consent of the Requisite Holders (which for purpose of this Section 2.10 is not subject to the Series C2/D2 Voting Restriction), enter into any agreement with any holder or prospective holder of any securities of the Company that would provide to such holder the right to include securities in any registration on other than a subordinate basis after all Holders have had the opportunity to include in the registration and offering all shares of Registrable Securities that they wish to so include; provided, that this limitation shall not apply to any additional Investor who becomes a party to this Agreement in accordance with Section 6.9.

2.11 "Market Stand-off" Agreement. Each Holder hereby agrees that it will not, without the prior written consent of the managing underwriter (in connection with the IPO) or the SPAC (in connection with a SPAC Transaction), during the period commencing on the date of (a) the final prospectus relating to the IPO or (b) the closing of the SPAC Transaction, and ending on the date specified by the Company or the managing underwriter (for the IPO) or the Company and the SPAC (for a SPAC Transaction) (such period not to exceed one hundred eighty (180) days, (i) lend; offer; pledge; sell; contract to sell; sell any option or contract to purchase; purchase any option or contract to sell; grant any option, right, or warrant to purchase; or otherwise transfer or dispose of, directly or indirectly, any shares of Common Stock or any securities convertible into or exercisable or exchangeable (directly or indirectly) for Common Stock (or, in the case of a SPAC Transaction, any shares of the common stock or other share capital of the SPAC or any securities convertible into or exercisable or exchangeable, directly or indirectly, for such common stock or other share capital) held immediately before the effective date of the registration statement for such offering or transaction or (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of such securities, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Common Stock, the common stock or share capital of the SPAC, as applicable, or other securities, in cash, or otherwise. The foregoing provisions of this Section 2.11 (A) shall apply only to the IPO or the SPAC Transaction, as applicable, (B) shall not apply to the sale of any shares to an underwriter pursuant to an underwriting agreement, and (C) shall be applicable to the Holders only if all officers, directors and stockholders individually owning more than one percent (1%) of the Company's outstanding Common Stock (after giving effect to conversion into Common Stock of all outstanding Preferred Stock) are subject to the same restrictions. Any discretionary waiver or termination of the restrictions of any or all of such agreements by the Company or the underwriters shall apply pro rata to all Holders subject to such agreements, based on the number of shares subject to such agreements. The underwriters in connection with the IPO, and the SPAC in connection with a SPAC Transaction, are intended third-party beneficiaries of this Section 2.11 and shall have the right, power, and authority to enforce the provisions hereof as though they were a party hereto. Each Holder further agrees to execute such agreements as may be reasonably requested by the Company or the underwriters (in connection with the IPO) and the Company or the SPAC (in connection with a SPAC Transaction) that are consistent with this Section 2.11 or that are necessary to give further effect thereto.

2.12 Restrictions on Transfer.

(a) The Preferred Stock and the Registrable Securities shall not be sold, pledged, or otherwise transferred, and the Company shall not recognize and shall issue stop-transfer instructions to its transfer agent with respect to any such sale, pledge, or transfer, except upon the conditions specified in this Agreement, which conditions are intended to ensure compliance with the provisions of the Securities Act. A transferring Holder will cause any proposed purchaser, pledgee, or transferee of the Preferred Stock and the Registrable Securities held by such Holder to agree to take and hold such securities subject to the provisions and upon the conditions specified in this Agreement.

(b) Each certificate or instrument representing (i) the Preferred Stock, (ii) the Registrable Securities, and (iii) any other securities issued in respect of the securities referenced in clauses (i) and (ii), upon any stock split, stock dividend, recapitalization, merger, consolidation, or similar event, shall (unless otherwise permitted by the provisions of Section 2.12(c)) be stamped or otherwise imprinted with a legend substantially in the following form:

THE SECURITIES REPRESENTED HEREBY HAVE BEEN ACQUIRED FOR INVESTMENT AND HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933. SUCH SHARES MAY NOT BE SOLD, PLEDGED, OR TRANSFERRED IN THE ABSENCE OF SUCH REGISTRATION OR A VALID EXEMPTION FROM THE REGISTRATION AND PROSPECTUS DELIVERY REQUIREMENTS OF SAID ACT.

THE SECURITIES REPRESENTED HEREBY MAY BE TRANSFERRED ONLY IN ACCORDANCE WITH THE TERMS OF AN AGREEMENT BETWEEN THE COMPANY AND THE STOCKHOLDER, A COPY OF WHICH IS ON FILE WITH THE SECRETARY OF THE COMPANY.

The Holders consent to the Company making a notation in its records and giving instructions to any transfer agent of the Restricted Securities in order to implement the restrictions on transfer set forth in this Section 2.12.

(c) The holder of each certificate representing Restricted Securities, by acceptance thereof, agrees to comply in all respects with the provisions of this Section 2. Before any proposed sale, pledge, or transfer of any Restricted Securities, unless there is in effect a registration statement under the Securities Act covering the proposed transaction, the Holder thereof shall give notice to the Company of such Holder's intention to effect such sale, pledge, or transfer. Each such notice shall describe the manner and circumstances of the proposed sale, pledge, or transfer in sufficient detail and, if reasonably requested by the Company, shall be accompanied at such Holder's expense by either (i) a written opinion of legal counsel who shall, and whose legal opinion shall, be reasonably satisfactory to the Company, addressed to the Company, to the effect that the proposed transaction may be effected without registration under the Securities Act; (ii) a "no action" letter from the SEC to the effect that the proposed sale, pledge, or transfer of such Restricted Securities without registration will not result in a recommendation by the staff of the SEC that action be taken with respect thereto; or (iii) any other evidence reasonably satisfactory to counsel to the Company to the effect that the proposed sale, pledge, or transfer of the Restricted Securities may be effected without registration under the Securities Act, whereupon the Holder of such Restricted Securities shall be entitled to sell, pledge, or transfer such Restricted Securities in accordance with the terms of the notice given by the Holder to the Company. The Company will not require such a legal opinion or "no action" letter (A) in any transaction in compliance with SEC Rule 144 or (B) in any transaction in which such Holder distributes Restricted Securities to an Affiliate of such Holder for no consideration; provided, that each transferee agrees in writing to be subject to the terms of this Section 2.12. Each certificate or instrument evidencing the Restricted Securities transferred as above provided shall bear, except if such transfer is made pursuant to SEC Rule 144, the appropriate restrictive legend set forth in Section 2.12(b), except that such certificate shall not bear such restrictive legend if, in the opinion of counsel for such Holder and the Company, such legend is not required in order to establish compliance with any provisions of the Securities Act.

2.13 Termination of Registration Rights. The right of any Holder to request registration or inclusion of Registrable Securities in any registration pursuant to Section 2.1 or Section 2.2 shall terminate upon the earliest to occur of:

(a) the closing of (i) a Deemed Liquidation Event, as such term is defined in the Restated Certificate or (ii) a SPAC Transaction;

(b) such time as Rule 144 or another similar exemption under the Securities Act is available for the sale of all of such Holder's shares without limitation during a three-month period without registration; and

(c) the third anniversary of the Qualified Public Offering.

3. Information and Observer Rights.

3.1 Delivery of Financial Statements. The Company shall deliver to each Major Holder:

(a) as soon as practicable, but in any event on or before September 30 following the end of each fiscal year of the Company, (i) a balance sheet as of the end of such year, (ii) statements of income and of cash flows for such year, and a comparison between (A) the actual amounts as of and for such fiscal year and (B) the comparable amounts for the prior year and as included in the Budget (as defined in Section 3.1(d)) for such year, with an explanation of any material differences between such amounts and a schedule as to the sources and applications of funds for such year, and (iii) a statement of stockholders' equity as of the end of such year, all such financial statements audited and certified by independent public accountants of nationally recognized standing selected by the Board, including the Requisite Directors;

(b) as soon as practicable, but in any event within forty-five (45) days after the end of each of the first three (3) quarters of each fiscal year of the Company, unaudited statements of income and of cash flows for such fiscal quarter, and an unaudited balance sheet as of the end of such fiscal quarter, all prepared in accordance with GAAP (except that such financial statements may (i) be subject to normal year-end audit adjustments and (ii) not contain all notes thereto that may be required in accordance with GAAP);

(c) as soon as practicable, but in any event within thirty (30) days of the end of each month, unaudited statements of income and of cash flows for such month, and an unaudited balance sheet as of the end of such month, all prepared in accordance with GAAP (except that such financial statements may (i) be subject to normal year-end audit adjustments and (ii) not contain all notes thereto that may be required in accordance with GAAP);

(d) as soon as practicable, but in any event before the end of each fiscal year, a budget and business plan for the next fiscal year (collectively, the "**Budget**"), prepared on a monthly basis, including balance sheets, income statements, and statements of cash flow for such months and, promptly after prepared, any other budgets or revised budgets prepared by the Company;

(e) with respect to the financial statements called for in Section 3.1(a), Section 3.1(b) and Section 3.1(c), an instrument executed by the chief financial officer and chief executive officer of the Company certifying that such financial statements were prepared in accordance with GAAP consistently applied with prior practice for earlier periods (except as otherwise set forth in Section 3.1(b) and Section 3.1(c)) and fairly present the financial condition of the Company and its results of operation for the periods specified therein; and

(f) such other information and materials as the Board may determine to distribute to the Major Holders from time to time.

If, for any period, the Company has any subsidiary whose accounts are consolidated with those of the Company, then in respect of such period the financial statements delivered pursuant to the foregoing sections shall be the consolidated and consolidating financial statements of the Company and all such consolidated subsidiaries.

Notwithstanding anything else in this Section 3.1 to the contrary, the Company may cease providing the information set forth in this Section 3.1 during the period starting with the date sixty (60) days before the Company's good-faith estimate of the date of filing of a registration statement if it reasonably concludes it must do so to comply with the SEC rules applicable to such registration statement and related offering; provided, that the Company's covenants under this Section 3.1 shall be reinstated at such time as the Company is no longer actively employing its commercially reasonable efforts to cause such registration statement to become effective.

3.2 Board Notice of Material Events and Occurrences. The Company shall provide each member of the Board notification of the existence of any known material breach by the Company of any covenant in this Agreement, the Right of First Refusal and Co-Sale Agreement or the Voting Agreement.

3.3 Inspection. The Company shall permit each Major Holder, at such Major Holder's expense, to: request a copy of the most recent capitalization table of the Company; visit and inspect the Company's properties; examine its books of account and records; and discuss the Company's affairs, finances, and accounts with its officers, during normal business hours of the Company as may be reasonably requested by the Major Holder; provided, however, that the Company shall not be obligated pursuant to this Section 3.3 to provide access to any information that it reasonably and in good faith considers to be a trade secret or confidential information (unless covered by an enforceable confidentiality agreement, in form acceptable to the Company) or the disclosure of which would adversely affect the attorney-client privilege between the Company and its counsel.

3.4 Observer Rights. For so long as Investors affiliated with each of Longitude Venture Partners II, L.P., Quaker Bioventures II, L.P., TVM Capital, Asahi Kasei Medical Co., Ltd., Bain Capital Life Sciences Fund, L.P. ("**BCLS**") and D1 Master Holdco I LLC ("**D1 Capital**") own not less than 500,000 shares of the Preferred Stock (or an equivalent amount of Common Stock issued upon conversion thereof) (as adjusted for any stock split, stock dividend, combination, or other recapitalization or reclassification effected after the date hereof), the Company shall invite one (1) representative of each such Investor and/or Key Holder (as applicable) to attend all meetings of the Board in a nonvoting observer capacity and, in this respect, shall give such representative copies of all notices, minutes, consents, and other materials that it provides to its directors. For so long as Investors affiliated with Colony Harvest Ltd ("**Colony Harvest**") own, collectively, not less than 500,000 shares of the Preferred Stock (or an equivalent amount of Common Stock issued upon conversion thereof) (as adjusted for any stock split, stock dividend, combination, or other recapitalization or reclassification effected after the date hereof), the Company shall invite one (1) representative designated by Colony Harvest to attend all meetings of the Board in a nonvoting observer capacity and, in this respect, shall give such representative copies of all notices, minutes, consents, and other materials that it provides to its directors. Each representative referred to in the preceding two sentences (each an "**Observer**") shall agree to hold in confidence and trust and to act in a fiduciary manner with respect to all information provided to such Observer. Notwithstanding the foregoing, the Company reserves the right to withhold any information and to exclude any such Observer from any meeting or portion thereof if access to such information or attendance at such meeting could adversely affect the attorney-client privilege between the Company and its counsel or result in a conflict of interest, or if such Investor and/or Key Holder or its Observer is a competitor of the Company.

3.5 Termination of Information and Observer Rights. The covenants set forth in Section 3.1, Section 3.2, Section 3.3 and Section 3.4 shall terminate and be of no further force or effect (a) immediately before the consummation of the IPO, (b) when the Company first becomes subject to the periodic reporting requirements of Section 12(g) or 15(d) of the Exchange Act, (c) upon a Deemed Liquidation Event, as such term is defined in the Restated Certificate, or (d) upon the closing of a SPAC Transaction, whichever event occurs first.

3.6 Confidentiality. Each Investor agrees that such Investor will keep confidential and will not disclose, divulge, or use for any purpose (other than to monitor its investment in the Company) any confidential information obtained from the Company pursuant to the terms of this Agreement (including notice of the Company's intention to file a registration statement or any information provided in connection with a request for a waiver under or an amendment of any term of this Agreement), unless such confidential information (a) is known or becomes known to the public in general (other than as a result of a breach of this Section 3.6 by such Investor), (b) is or has been independently developed or conceived by the Investor without use of the Company's confidential information, or (c) is or has been made known or disclosed to the Investor by a third party without a breach of any obligation of confidentiality such third party may have to the Company; provided, however, that an Investor may disclose confidential information (i) to its attorneys, accountants, consultants, and other professionals to the extent necessary to obtain their services in connection with monitoring its investment in the Company; (ii) to any prospective purchaser of any Registrable Securities from such Investor, if such prospective purchaser agrees to be bound by the provisions of this Section 3.6; (iii) to any current or prospective Affiliate, partner, member, stockholder, or wholly owned subsidiary of such Investor in the ordinary course of business, provided, that such Person is bound by an enforceable non-disclosure agreement with such Investor obligating such Person to maintain the confidentiality of such information; or (iv) as may otherwise be required by law, provided, that (A) if such required disclosure is specifically targeted at information regarding the Company, the Investor promptly notifies the Company of such disclosure and (B) the Investor takes reasonable steps to minimize the extent of any such required disclosure; or (v) as routinely or periodically requested by a regulator or self-regulatory organization.

4. Rights to Future Stock Issuances.

4.1 Right of First Offer. Subject to the terms and conditions of this Section 4.1 and applicable securities laws, if the Company proposes to offer or sell any New Securities, the Company shall first offer such New Securities to each Major Holder. A Major Holder shall be entitled to apportion the right of first offer hereby granted to it among itself and its Affiliates in such proportions as it deems appropriate.

(a) The Company shall give notice (the "**Offer Notice**") to each Major Holder, stating (i) its bona fide intention to offer such New Securities, (ii) the number of such New Securities to be offered, and (iii) the price and terms, if any, upon which it proposes to offer such New Securities.

(b) By notification to the Company within twenty (20) days after the Offer Notice is given, each Major Holder may elect to purchase or otherwise acquire, at the price and on the terms specified in the Offer Notice, up to that portion of such New Securities which equals the proportion that the Common Stock then held (including all shares of Common Stock then issuable (directly or indirectly) upon conversion and/or exercise, as applicable, of the Preferred Stock and any other Derivative Securities then held by such Major Holder) bears to the total Common Stock of the Company then outstanding (assuming full conversion and/or exercise, as applicable, of all Preferred Stock and outstanding Derivative Securities, but excluding Derivative Securities reserved for issuance pursuant to the Company's stock and option plans that have been approved by the Board). At the expiration of such twenty (20) day period, the Company shall promptly notify each Major Holder that elects to purchase or acquire all the shares available to it (each, a "**Fully Exercising Holder**") of any other Major Holder's failure to do likewise. During the ten (10) day period commencing after the Company has given such notice, each Fully Exercising Holder may, by giving notice to the Company, elect to purchase or acquire, in addition to the number of shares specified above, up to that portion of the New Securities for which Major Holders were entitled to subscribe but that were not subscribed for by the Major Holders which is equal to the proportion that the Common Stock issued and held, or issuable (directly or indirectly) upon conversion and/or exercise, as applicable, of the Preferred Stock and any other Derivative Securities then held, by such Fully Exercising Holder bears to the Common Stock issued and held, or issuable (directly or indirectly) upon conversion and/or exercise, as applicable, of the Preferred Stock and any other Derivative Securities then held by all Fully Exercising Holders who wish to purchase such unsubscribed shares. The closing of any sale pursuant to this Section 4.1(b) shall occur within the later of one hundred and twenty (120) days of the date that the Offer Notice is given and the date of initial sale of New Securities pursuant to Section 4.1(c).

(c) If all New Securities referred to in the Offer Notice are not elected to be purchased or acquired as provided in Section 4.1(b), the Company may, during the ninety (90) day period following the expiration of the periods provided in Section 4.1(b), offer and sell the remaining unsubscribed portion of such New Securities to any Person or Persons at a price not less than, and upon terms no more favorable to the offeree than, those specified in the Offer Notice. If the Company does not enter into an agreement for the sale of the New Securities within such period, or if such agreement is not consummated within thirty (30) days of the execution thereof, the right provided hereunder shall be deemed to be revived and such New Securities shall not be offered unless first reoffered to the Major Holders in accordance with this Section 4.1.

(d) The right of first offer in this Section 4.1 shall not be applicable to: (i) Exempted Securities (as defined in the Restated Certificate), (ii) shares of Common Stock issued in the IPO or SPAC Transaction; and (iii) the issuance of shares of Preferred Stock after the date hereof pursuant to the Purchase Agreement.

4.2 Termination. The covenants set forth in Section 4.1 shall terminate and be of no further force or effect (i) immediately before the consummation of the IPO, (ii) when the Company first becomes subject to the periodic reporting requirements of Section 12(g) or 15(d) of the Exchange Act, (iii) upon a Deemed Liquidation Event, as such term is defined in the Restated Certificate, or (iv) upon the closing of a SPAC Transaction, whichever event occurs first.

5. Additional Covenants.

5.1 Insurance. The Company shall use commercially reasonable efforts to cause its Directors and Officers liability insurance policy to be maintained in an amount and on terms and conditions satisfactory to the Board, until such time as the Board determines that such insurance should be discontinued.

5.2 Employee Agreements. The Company will cause (i) each person previously, now or hereafter employed by it or by any subsidiary (or engaged by the Company or any subsidiary as a consultant/independent contractor) with access to confidential information and/or trade secrets to enter into a nondisclosure and proprietary rights assignment agreement and (ii) each Key Employee to enter into a one (1) year noncompetition and nonsolicitation agreement on substantially the Company's customary form of agreement. In addition, the Company shall not amend, modify, terminate, waive, or otherwise alter, in whole or in part, any of the above-referenced agreements or any restricted stock agreement between the Company and any employee, without the approval of a majority of the Board, including the Requisite Directors.

5.3 Employee Stock. Unless otherwise approved by the Board, all future employees and consultants of the Company who purchase, receive options to purchase, or receive awards of shares of the Company's capital stock after the date hereof shall be required to execute restricted stock or option agreements, as applicable, providing for (i) vesting of shares over a four (4) year period, with the first twenty-five percent (25%) of such shares vesting following twelve (12) months of continued employment or service, and the remaining shares vesting in equal monthly installments over the following thirty-six (36) months, (ii) a market stand-off provision substantially similar to that in Section 2.11 and (iii) no transfers of shares prior to vesting of such shares. In addition, unless otherwise approved by the Board, the Company shall retain a "right of first refusal" on employee transfers until the IPO or a SPAC Transaction and shall have the right to repurchase unvested shares at cost upon termination of employment of a holder of restricted stock. All option grants by the Company shall have an exercise price equal to the fair market value on the date of grant, as determined by the Board and pursuant to a Section 409A valuation report completed by an outside valuation firm. The Company shall condition the receipt of any shares of Common Stock in connection with the exercise of stock options granted to any employees and consultants of the Company under the Company's 2010 Stock Option and Grant Plan, as may be amended and/or restated from time to time, to the execution and delivery by such employees or consultants of a stockholders agreement granting to the Company a right of first refusal on such shares of Common Stock.

5.4 Board Matters. The Company shall reimburse the nonemployee directors and observers appointed pursuant to Section 3.4 hereof for all reasonable out-of-pocket travel expenses incurred (consistent with the Company's travel policy) in connection with attending meetings of the Board and committees thereof. The Investor Designees (as defined in the Voting Agreement) shall have the right to serve on all committees of the Board. The Board shall meet at least once every three months, unless otherwise approved by a majority of the Board, including the approval of the Requisite Directors.

5.5 Successor Indemnification. If the Company or any of its successors or assignees consolidates with or merges into any other Person and is not the continuing or surviving corporation or entity of such consolidation or merger, then to the extent necessary, proper provision shall be made so that the successors and assignees of the Company assume the obligations of the Company with respect to indemnification of members of the Board as in effect immediately before such transaction, whether such obligations are contained in the Company's Bylaws, the Restated Certificate, or elsewhere, as the case may be.

5.6 Matters Requiring Investor Director Approval. The Company hereby covenants and agrees that it shall not, without approval of the Board, which approval must include the affirmative vote of the Requisite Directors, take any action that would, or would reasonably be expected to, have a material effect on the Company, its business or its operations, including without limitation:

(a) make, or permit any subsidiary to make, any loan or advance to, or own any stock or other securities of, any subsidiary or other corporation, partnership, or other entity unless it is wholly owned by the Company;

(b) make, or permit any subsidiary to make, any loan or advance to any Person, including, without limitation, any employee or director of the Company or any subsidiary, except advances and similar expenditures in the ordinary course of business or under the terms of an employee stock or option plan approved by the Board;

(c) guarantee, directly or indirectly, or permit any subsidiary to guarantee, directly or indirectly, any indebtedness except for trade accounts of the Company or any subsidiary arising in the ordinary course of business;

(d) make any investment inconsistent with any investment policy approved by the Board;

(e) otherwise enter into or be a party to any transaction with any director, officer, or employee of the Company or any "associate" (as defined in Rule 12b-2 promulgated under the Exchange Act) of any such Person, except for transactions contemplated by this Agreement, the Purchase Agreement, and the Transaction Agreements (as defined in the Purchase Agreement); transactions resulting in payments to or by the Company in an aggregate amount less than $60,000 per year; or transactions made in the ordinary course of business and pursuant to reasonable requirements of the Company's business and upon fair and reasonable terms that are approved by a majority of the Board, including the approval of the Requisite Directors;

(f) hire, terminate, or change the compensation of the executive officers, including approving any option grants or stock awards to executive officers;

(g) change the principal business of the Company, enter new lines of business, or exit the current line of business;

(h) sell, assign, license, pledge, or encumber material technology or intellectual property, other than licenses granted in the ordinary course of business;

(i) enter into any corporate strategic relationship involving the payment, contribution, or assignment by the Company or to the Company of money or assets greater than $250,000;

(j) enter into any transaction pursuant to which the Company or any of its subsidiaries would incur Term Debt (as defined below) in which the aggregate principal amount outstanding of all Term Debt would be in excess of $5,000,000; or

(k) take any action that, pursuant to the Restated Certificate, expressly requires approval of or ratification by the Board.

For purposes hereof, "Term Debt" shall mean indebtedness for borrowed money but shall exclude (i) trade payables incurred in the ordinary course of business and (ii) indebtedness pursuant to any accounts receivable facility or other revolving debt facility of the Company.

5.7 Matters Requiring Supermajority Director Approval. The Company hereby covenants and agrees that it shall not incur, and shall procure that none of its subsidiaries will incur, any Additional Term Debt (as defined below), pursuant any new or existing facility of the Company or any of its subsidiaries, without approval of the Requisite Directors, which approval must include the affirmative vote of the director then elected by the holders of Series C1 Preferred Stock. For purposes hereof, "Additional Term Debt" shall mean each additional incurrence or drawdown of Term Debt that, if incurred or drawn down, would result in aggregate principal amount outstanding under all Term Debt of the Company and its subsidiaries to be more than $35,000,000.

5.8 Termination of Covenants. The covenants set forth in this Section 5, except for Section 5.5, shall terminate and be of no further force or effect (a) immediately before the consummation of the IPO or the closing of a SPAC Transaction, (b) when the Company first becomes subject to the periodic reporting requirements of Section 12(g) or 15(d) of the Exchange Act, or (c) upon a Deemed Liquidation Event, as such term is defined in the Restated Certificate, whichever event occurs first.

6. Miscellaneous.

6.1 Successors and Assigns. The rights under this Agreement may be assigned (but only with all related obligations) by a Holder to a transferee of Registrable Securities that (a) is an Affiliate of a Holder; (b) is a Holder's Immediate Family Member or trust for the benefit of an individual Holder or one or more of such Holder's Immediate Family Members; or (c) acquires at least 1,000,000 shares of Registrable Securities (as adjusted for any stock combination, stock split, stock dividend, recapitalization or other similar transaction) held by the Holder at the time of the transfer or, if less, all of the Registrable Securities held by such Holder; provided, however, that (i) the Company is, within a reasonable time after such transfer, furnished with written notice of the name and address of such transferee and the Registrable Securities with respect to which such rights are being transferred; and (ii) such transferee agrees in a written instrument delivered to the Company to be bound by and subject to the terms and conditions of this Agreement, including the provisions of Section 2.11. For the purposes of determining the number of shares of Registrable Securities held by a transferee, the holdings of a transferee (A) that is an Affiliate or stockholder of a Holder; (B) who is a Holder's Immediate Family Member; or (C) that is a trust for the benefit of an individual Holder or such Holder's Immediate Family Member shall be aggregated together and with those of the transferring Holder; provided further, that all transferees who would not qualify individually for assignment of rights shall have a single attorney-in-fact for the purpose of exercising any rights, receiving notices, or taking any action under this Agreement. The terms and conditions of this Agreement inure to the benefit of and are binding upon the respective successors and permitted assignees of the parties. Nothing in this Agreement, express or implied, is intended to confer upon any party other than the parties hereto or their respective successors and permitted assignees any rights, remedies, obligations or liabilities under or by reason of this Agreement, except as expressly provided herein.

6.2 Governing Law. This Agreement and any controversy arising out of or relating to this Agreement shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

6.3 Counterparts; Facsimile. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. This Agreement may also be executed and delivered by facsimile or electronic mail signature in PDF or similar format and in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

6.4 Titles and Subtitles. The titles and subtitles used in this Agreement are for convenience only and are not to be considered in construing or interpreting this Agreement.

6.5 Notices. All notices and other communications given or made pursuant to this Agreement shall be in writing and shall be deemed effectively given upon the earlier of actual receipt or: (a) personal delivery to the party to be notified; (b) when sent, if sent by electronic mail or facsimile during the recipient's normal business hours, and if not sent during normal business hours, then on the recipient's next business day; (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid; or (d) one (1) business day after the business day of deposit with a nationally recognized overnight courier, freight prepaid, specifying next-day delivery, with written verification of receipt. All communications shall be sent to the respective parties at their addresses as set forth on Schedule A or Schedule B (as applicable) hereto, or to the principal office of the Company and to the attention of the Chief Executive Officer, in the case of the Company, or to such email address, facsimile number, or address as subsequently modified by written notice given in accordance with this Section 6.5. If notice is given to the Company, a copy shall also be sent to Latham & Watkins LLP, 200 Clarendon Street, 27th Floor, Boston, Massachusetts 02116, Attention: Stephen W. Ranere, and if notice is given to Investors, a copy shall also be given to Morrison & Foerster LLP, Edinburgh Tower, 33/F The Landmark, 15 Queen's Road Central, Hong Kong, China, Attention: Thomas T.H. Chou; Cooley LLP, 500 Boylston Street, 14th Floor, Boston, MA 02116, Attention: Ryan Sansom; and Sidley Austin LLP, 787 Seventh Avenue, New York, NY 10019, Attention: Geoff Levin.

6.6 Amendments and Waivers. Any term of this Agreement may be amended and the observance of any term of this Agreement may be waived (either generally or in a particular instance, and either retroactively or prospectively) only with the written consent of the Company and the Requisite Holders; provided, that the Company may in its sole discretion waive compliance with Section 2.12(c) (and the Company's failure to object promptly in writing after notification of a proposed assignment allegedly in violation of Section 2.12(c) shall be deemed to be a waiver); and provided further that any provision hereof may be waived by any waiving party on such party's own behalf, without the consent of any other party. Notwithstanding the foregoing, (i) this Agreement may not be amended, and no provision hereof may be waived, in each case, in any way which would adversely affect the rights of the Key Holders hereunder in a manner disproportionate to any adverse effect such amendment or waiver would have on the rights of the Investors hereunder, without also the written consent of the holders of at least a majority of the Key Holder Registrable Securities, (ii) Section 3.4 of this Agreement or this clause (ii) may not be amended, and no portion thereof may be waived, as to any of Longitude Venture Partners II, L.P., Quaker Bioventures II, L.P., TVM Capital, Colony Harvest, Asahi Kasei Medical Co., Ltd., BCLS and/or D1 Capital without the consent of such party (for as long as such party is eligible to appoint an Observer pursuant to the terms thereof), (iii) this Agreement may not be amended, modified or terminated and the observance of any term hereunder may not be waived with respect to any Investor (including any Series C2/D2 Initial Holder (as defined in the Restated Certificate), as applicable) without the prior written consent of such Investor if (and only if) such amendment, modification, termination or waiver would adversely affect the rights of such Investor under this Agreement in a manner disproportionate to any adverse effect such amendment, modification, termination or waiver would have on the rights of the other Investors under this Agreement (it being agreed that a waiver of the provisions of Section 4 with respect to a particular transaction shall be deemed to apply to all Investors in the same fashion if such waiver does so by its terms, notwithstanding the fact that certain Investors may nonetheless, by agreement with the Company, purchase securities in such transaction) and (iv) neither this clause (iv) of this sentence nor the definition of "Requisite Directors" shall be amended, terminated or waived without the prior written consent of each of Endeavour Medtech Growth II LP, BCLS and Colony Harvest. The Company shall give prompt notice of any amendment or termination hereof or waiver hereunder to any party hereto that did not consent in writing to such amendment, termination, or waiver. Any amendment, termination, or waiver effected in accordance with this Section 6.6 shall be binding on all parties hereto, regardless of whether any such party has consented thereto. No waivers of or exceptions to any term, condition, or provision of this Agreement, in any one or more instances, shall be deemed to be or construed as a further or continuing waiver of any such term, condition, or provision.

6.7 Severability. In case any one or more of the provisions contained in this Agreement is for any reason held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision of this Agreement, and such invalid, illegal, or unenforceable provision shall be reformed and construed so that it will be valid, legal, and enforceable to the maximum extent permitted by law.

6.8 Aggregation of Stock. All shares of Registrable Securities held or acquired by Affiliates shall be aggregated together for the purpose of determining the availability of any rights under this Agreement and such Affiliated persons may apportion such rights as among themselves in any manner they deem appropriate.

6.9 Additional Investors. Notwithstanding anything to the contrary contained herein, if the Company issues additional shares of Preferred Stock after the date hereof, any purchaser of such shares of Preferred Stock may become a party to this Agreement by executing and delivering an additional counterpart signature page to this Agreement, and thereafter shall be deemed an "Investor" for all purposes hereunder. No action or consent by the Investors shall be required for such joinder to this Agreement by such additional Investor, so long as such additional Investor has agreed in writing to be bound by all of the obligations as an "Investor" hereunder.

6.10 Entire Agreement. This Agreement (including any Schedules and Exhibits hereto) constitutes the full and entire understanding and agreement among the parties with respect to the subject matter hereof, and any other written or oral agreement relating to the subject matter hereof existing between the parties is expressly canceled. Upon the effectiveness of this Agreement, the Prior Agreement shall be deemed amended and restated and superseded and replaced in its entirety by this Agreement, and shall be of no further force or effect.

6.11 Dispute Resolution. The parties (a) hereby irrevocably and unconditionally submit to the jurisdiction of the federal and state courts located within the geographic boundaries of the United States District Court for the District of Massachusetts for the purpose of any suit, action or other proceeding arising out of or based upon this Agreement, (b) agree not to commence any suit, action or other proceeding arising out of or based upon this Agreement except in the federal and state courts located within the geographic boundaries of the United States District Court for the District of Massachusetts, and (c) hereby waive, and agree not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above-named courts, that its property is exempt or immune from attachment or execution, that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court. The prevailing party shall be entitled to reasonable attorney's fees, costs, and necessary disbursements in addition to any other relief to which such party may be entitled. Each of the parties to this Agreement consents to personal jurisdiction for any equitable action sought in the U.S. District Court for the District of Massachusetts or any court of the Commonwealth of Massachusetts having subject matter jurisdiction.

6.12 Delays or Omissions. No delay or omission to exercise any right, power, or remedy accruing to any party under this Agreement, upon any breach or default of any other party under this Agreement, shall impair any such right, power, or remedy of such nonbreaching or nondefaulting party, nor shall it be construed to be a waiver of or acquiescence to any such breach or default, or to any similar breach or default thereafter occurring, nor shall any waiver of any single breach or default be deemed a waiver of any other breach or default theretofore or thereafter occurring. All remedies, whether under this Agreement or by law or otherwise afforded to any party, shall be cumulative and not alternative.

6.13 Acknowledgment from the Company. The Company acknowledges that the Investors are in the business of venture capital investing and therefore review the business plans and related proprietary information of many enterprises, including enterprises which may have products or services which compete directly or indirectly with those of the Company. Nothing in this Agreement shall preclude or in any way restrict the Investors from investing or participating in any particular enterprise whether or not such enterprise has products or services which compete with those of the Company.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

COMPANY:

RAPID MICRO BIOSYSTEMS, INC.

By: /s/ Robert Spignesi
Name: Robert Spignesi
Title: President and Chief Executive Officer

Address:

RAPID MICRO BIOSYSTEMS, INC.
1001 Pawtucket Blvd. West
Lowell, MA 01854
Attention: Chief Financial Officer

SIGNATURE PAGE TO SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

D1 MASTER HOLDCO I LLC

By: D1 Capital Partners Master LP,
its Managing Member

By: D1 Capital Partners GP Sub LLC,
its General Partner

By: /s/ Dan Sundheim
Name: Daniel Sundheim
Title: Authorized Signatory

Address:
c/o D1 Capital Management LC
9 West 57th Street
36th Floor
New York, NY 10019

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

ABG WTT-RAPID LIMITED

By: /s/ Charles Chon
Name: Charles Chon
Title: Director

SIGNATURE PAGE TO SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

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INVESTORS:

ENDEAVOUR MEDTECH GROWTH II LP

By: Endeavour Medtech II GP Limited
its General Partner

By: /s/ Nick Barton
Name: Nick Barton
Title: Director

ENDEAVOUR MEDTECH GROWTH II PARALLEL LP

By: Endeavour Medtech II GP Limited
its General Partner

By: /s/ Nick Barton
Name: Nick Barton
Title: Director

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

LONGITUDE VENTURE PARTNERS II, L.P.,
a Delaware Limited Partnership

By: Longitude Capital Partners II, LLC
its General Partner

By: /s/ Juliet Tammenoms Bakker
Name: Juliet Tammenoms Bakker
Title: Managing Director

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

QUAKER BIOVENTURES II, L.P.

By: QUAKER BIOVENTURES CAPITAL II, L.P., its general partner

By: QUAKER BIOVENTURES CAPITAL II, LLC, its general partner

By: /s/ Richard S. Kollender
Name: Richard S. Kollender
Title: Executive Manager

SIGNATURE PAGE TO SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

BAIN CAPITAL LIFE SCIENCES FUND, LP.

By: Bain Capital Life Sciences Partners, LP,
its general partner

By: Bain Capital Life Sciences Investors, LLC,
its general partner

By: /s/ Jeffrey Schwartz
Name: Jeffrey Schwartz
Title: Managing Director

BCIP LIFE SCIENCES ASSOCIATES, LP

By: Boylston Coinvestors, LLC,
its general partner

By: /s/ Jeffrey Schwartz
Name: Jeffrey Schwartz
Title: Authorized Signatory

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

COLONY HARVEST LTD

By: /s/ Fares Zahir
Name: Fares Zahir
Title: Authorized Signatory

SIGNATURE PAGE TO SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

/s/ Robert Spignesi
Robert Spignesi

SIGNATURE PAGE TO SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

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INVESTORS:

BLACKROCK HEALTH SCIENCES TRUST II

By: BlackRock Advisors, LLC, its Investment Adviser

By: /s/ Hongying Erin Xie
Name: Hongying Erin Xie
Title: Managing Director

BLACKROCK HEALTH SCIENCES MASTER UNIT TRUST

By: BlackRock Capital Management, Inc., its Investment Adviser

By: /s/ Hongying Erin Xie
Name: Hongying Erin Xie
Title: Managing Director

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

T. Rowe Price Health Sciences Fund, Inc.
TD Mutual Funds - TD Health Sciences Fund
T. Rowe Price Health Sciences Portfolio
Each account, severally not jointly

By: T. Rowe Price Associates, Inc., Investment Adviser or Subadviser, as applicable

By: /s/ Andrew Baek
Name: Andrew Baek
Title: Vice President, Senior Legal Counsel

Address:
T. Rowe Price Associates, Inc.
100 East Pratt Street
Baltimore, MD 21202
Attn.: Andrew Baek, Vice President and Senior Legal Counsel
Phone: 410-345-2090
Email: [XXX]

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

ADAGE CAPITAL PARTNERS, LP

By: Adage Capital Partners, GP, LLC, it's General Partner

By: Adage Capital Advisors, LLC, it's Managing Member

By: /s/ Dan Lehan
Name: Dan Lehan
Title: Chief Operating Officer

SIGNATURE PAGE TO SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

SUNLEY HOUSE CAPITAL MASTER LIMITED PARTNERSHIP

By: Sunley House Capital GP LP, its General Partner

By: Sunley House Capital GP LLC, its General Partner

By: /s/ Mohammed Anjarwala
Name: Mohammed Anjarwala
Title: Managing Director

SIGNATURE PAGE TO SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

CAAS OPPORTUNITY LLC

By: CaaS Capital Management its Manager

By: /s/ Semi Gogliormella
Name: Semi Gogliormella
Title: COO

SIGNATURE PAGE TO SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

IN WITNESS WHEREOF, the parties have executed this Seventh Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTORS:

/s/ Gurinder Grewal
Gurinder Grewal

SIGNATURE PAGE TO SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

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INVESTORS:

ALLY BRIDGE MEDALPHA MASTER FUND L.P.

By: Ally Bridge Group (NY) LLC, its manager

By: /s/ Anna Yaeger
Name: Anna Yaeger
Title: Portfolio Manager and President

SIGNATURE PAGE TO SEVENTH AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

SCHEDULE A

Investors

Investor Name and Address

D1 Master Holdco I LLC
c/o D1 Capital Management LC
9 West 57th Street
36th Floor
New York, NY 10019

T. Rowe Price Health Sciences Fund, Inc.
TD Mutual Funds - TD Health Sciences Fund
T. Rowe Price Health Sciences Portfolio
c/o T. Rowe Price Associates, Inc.
101 East Pratt Street
Baltimore, MD 21202
Attn.: Andrew Baek, Vice President and Senior
Legal Counsel
Phone: 410-345-2090
Email: [XXX]

BlackRock Health Sciences Trust II
BlackRock Health Sciences Master Unit Trust
c/o BlackRock
60 State Street, 19th/20th Floor
Boston, MA 02109
Attn: Erin Xie
Email: [XXX]
FEPMAssistantsUS@blackrock.com
With a copy (which shall not constitute notice) to:
c/o BlackRock
Office of the General Counsel
40 East 52nd Street
New York, NY 10022
Attn: David Maryles and Reid Fitzgerald
Email: legaltransactions@blackrock.com

Adage Capital Partners, LP
c/o Adage Capital Management
200 Clarendon St, 52nd St
Boston, MA 02116
Attn: Dan Lehan

Investor Name and Address

Sunley House Capital Master Limited Partnership
c/o Sunley House Capital Management LLC
Prudential Tower
800 Boylston Street, Suite 3300
Boston, MA 02199

CaaS Opportunity LLC
800 Third Avenue, 26th Floor
New York, NY 10022

Ally Bridge MedAlpha Master Fund L.P.
c/o Ally Bridge Group (NY) LLC
430 Park Avenue, 12th Floor
New York, NY 10022
Telephone: 646-829-9373
Contact Person: Daniel Johnson
E-mail: [XXX]

Gurinder Grewal
[XXX]
[XXX]

ABG WTT-Rapid Limited
c/o: Ally Bridge Group
Room 3002-4
30/F Gloucester Tower
The Landmark
15 Queen’s Road Central
Hong Kong

Endeavour Medtech Growth II LP
P.O Box 656
East Wing Trafalgar Court
Les Banques, St Peter Port,
Guernsey, GY1 3PP
Email: [XXX]
Email: [XXX]

Endeavour Medtech Growth II Parallel LP
P.O Box 656
East Wing Trafalgar Court
Les Banques, St Peter Port,
Guernsey, GY1 3PP
Email: [XXX]
Email: [XXX]

Investor Name and Address

Bain Capital Life Sciences
Attn: Jeffrey Schwartz, Managing Director
200 Clarendon Street
Boston, MA 02116
Phone: (617) 516-2585
Fax: (617) 652-3585
Email: [XXX]

BCIP Life Sciences Associates, LP
Attn: Jeffrey Schwartz, Managing Director
200 Clarendon Street
Boston, MA 02116
Phone: (617) 516-2585
Fax: (617) 652-3585
Email: [XXX]

Asahi Kasei Medical Co., Ltd.
1-105 Kanda Jinbocho, Chiyoda-ku
Tokyo 101-8101, Japan

Colony Harvest Ltd
2nd Floor, The Grand Pavilion Commercial Centre
PO. Box 10338, Grand Cayman KY1-1003
Cayman Islands

KPCB Holdings, Inc., as nominee
Kleiner Perkins Caufield & Byers
2750 Sand Hill Road
Menlo Park, CA 94025

TVM Life Science Ventures VI GmbH & Co. KG
c/o TVM Capital
Ottostr. 4
80333 München Germany
Attn: Stefan Fischer
Phone: 011 49 89 998992-0
Fax: 011 49 89 998992-55

TVM Life Science Ventures VI, L.P.
c/o TVM Capital
Ottostr. 4
80333 München Germany
Attn: Stefan Fischer
Phone: 011 49 89 998992-0
Fax: 011 49 89 998992-55

Investor Name and Address

Fletcher Spaght Ventures II, L.P.
222 Berkeley Street
20th Floor
Boston, MA 02116

FSV II, L.P.
222 Berkeley Street
20th Floor
Boston, MA 02116

FSV II-B, L.P.
222 Berkeley Street
20th Floor
Boston, MA 02116

Quaker BioVentures II, L.P.
150 Monument Road, Suite 205
Bala Cynwyd, PA 19004

TPG RAMB Holdings, L.P.
301 Commerce
Suite 3300
Fort Worth, Texas 76102
United States
Attention: Matthew Coleman

Longitude Venture Partners II, L.P.
545 Steamboat Road
Greenwich, Connecticut 06830
Attention: David Hirsch

Robert Spignesi
[XXX]
[XXX]

Christopher Cashman
[XXX]
[XXX]

Philip Stewart
[XXX]
[XXX]

Julie Sperry
[XXX]
[XXX]

Manbro P.E. IV, LP
1000 Lakeside Avenue
Cleveland, OH 44114

Foundation Investments of Ohio Ltd.
1000 Lakeside Avenue
Cleveland, OH 44114

MSF Private Equity Fund LLC
25701 Science Park Drive
Cleveland, OH 44122
With a copy to:
Investments
c/o Parkwood LLC
1000 Lakeside Avenue
Cleveland, OH 44114

Mellon Family Investment Company V
Legal and U.S. Mail:
P.O. Box RKM
Ligonier, PA 15658
Attn: Douglas L. Sisson
Overnight only for physical address:
[XXX]
[XXX]

Richard King Mellon Foundation
Legal and U.S. Mail:
BNY Mellon Center
500 Grant St., Suite 4106
Pittsburgh, PA 15219
With a copy to:
P.O. Box RKM
Ligonier, PA 15658
Attn: Douglas L. Sisson
Overnight only for physical address:
[XXX]
[XXX]

Foster & Foster Capital V LLC
10 Westport Road, Suite C 205
Wilton, CT 06897

Hepalink USA Inc.
Drake Oak Brook Plaza
2215 York Road, Suite 205
Oak Brook, IL 60523

Biomedical Sciences Investment Fund Pte Ltd
250 North Bridge Road #20-02
Raffles City Tower
Singapore 179101

Andrew Khouri
[XXX]
[XXX]

Margaret Blake Garvan Trust Margaret B. Garvan
and Thomas P. Monath Co-Trustees UA 11/1/2001
[XXX]
[XXX]

Waycross Ventures LLC
2750 Sand Hill Road
Menlo Park, CA 94025
Attn: Brook Byers

SCHEDULE B

Key Holders

Key Holder Name and Address
Straus Holdings, Inc.
1 Oak Park Drive
Bedford, MA 01730

Exhibit 10.7

LEASE

1001 PAWTUCKET, L.L.C., LANDLORD

TO

RAPID MICRO BIOSYSTEMS, INC., TENANT

This LEASE made as of the Date of Lease by and between Landlord and Tenant.

1. Basic Lease Terms and Certain Defined Terms.

Date of Lease:	As of October 21, 2013
Landlord:	1001 Pawtucket, L.L.C., a Delaware limited liability company, having an address c/o Winstanley Enterprises, Inc., 150 Baker Avenue Extension, Suite 303, Concord, Massachusetts 01742 Attn: Carter Winstanley.
Tenant:	Rapid Micro Biosystems, Inc., a Delaware corporation, having an address at One Oak Park Drive, Bedford, Massachusetts 01730.
Address of Property:	1001 Pawtucket Boulevard, Lowell, Massachusetts.
Building and Property:	The building known and numbered as 1001 Pawtucket Boulevard, Lowell, Massachusetts and containing 835,629 rentable square feet ("Building") (the Building and the parcel of land on which it is located being collectively referred to as the "Property").
Permitted Uses:	See Section 5.
Premises:	39,252 aggregate rentable square feet within the Building in the locations delineated on Exhibit A-1, consisting of the entirety of POD L2/A8 on the second floor of the Building which measures 38,525 rentable square feet and a portion of POD LG/A8 on the ground floor of the Building for storage which measures 727 rentable square feet. The Premises includes the portion thereof designated as the "Clean Room Premises" on the attached Exhibit A-1. The number of square feet of the Premises and Building have conclusively been agreed to by the parties.
Tenant's Pro Rata Share:	4.70%, which is the percentage the rentable square footage in the Premises bears to the Building rentable square footage. Notwithstanding the foregoing, during the Early Access Period (in which Tenant shall only pay Additional Rent for Operating Expenses, Landlord's Taxes and Tenant's Cafeteria Payment with respect to the Clean Room Premises) Tenant's Pro Rata Share shall equal 0.56%.

Term:

Initial Term:	The period commencing on the date on which Tenant takes occupancy of the Premises for the conduct of its business after its receipt of a certificate of occupancy for the entire Premises, but in no event later than May 1, 2014 (as applicable, the "Term Commencement Date"). The Term shall expire on the last day of the fifth (5th) Lease Year ("Termination Date") (which, for example, would be July 31, 2019 if the Term Commencement Date occurs on May 1, 2014, as the First Lease Year is fifteen (15) months).
Extension Term:	One (1) extension term of five (5) years, as provided in Section 4.
Lease Year:	Each Lease Year shall consist of twelve (12) calendar months beginning with the Term Commencement Date, except that if the Term Commencement Date is not the first day of a calendar month, then Lease Year 1 shall include the partial month at the beginning of the Term and the Basic Rent for Lease Year 1 shall be proportionately increased based on any such additional partial month. Notwithstanding the foregoing, Lease Year 1 shall consist of fifteen (15) calendar months along with any applicable partial month as described in the previous sentence.
Basic Rent Commencement Date:	The date that is three (3) months following the Term Commencement Date.
Broker:	Cassidy Turley
Management Company:	Winstanley Property Management, LLC
Security Deposit:	$250,000 in the form of a letter of credit subject to Section 36.
Parking Allotment:	Tenant's Pro Rata Share of all parking spaces on the Property. There are currently estimated to be approximately 1,685 total parking spaces on the Property. Tenant shall be entitled to five (5) Reserved Parking Spaces as shown on the attached Exhibit A-2 for Tenant's exclusive use. The Reserved Parking Spaces shall be counted towards the Parking Allotment. The Parking Allotment, including the Reserved Parking Space, will be provided to Tenant without charge.

Basic Rent:

Initial Term: Commencing on the Basic Rent Commencement Date, Basic Rent shall be due and payable in equal monthly installments as provided in Section 6 of the Lease as follows:

Time Period	Rent per Rentable Square Foot	Annualized Basic Rent	Monthly Basic Rent
Lease Year 1	$ 5.00	$196,260.00	$16,355.33
Lease Year 2	$ 5.25	$206,073.00	$17,172.75
Lease Year 3	$ 5.50	$215,886.00	$17,990.50
Lease Year 4	$ 5.75	$225,699.00	$18,808.25
Lease Year 5	$ 6.00	$235,512.00	$19,626.00

Extension Term: As described in Section 4.

Additional Rent: All amounts payable by Tenant under this Lease other than Basic Rent, including without limitation Additional Rent as described in Sections 6.2 through 6.5, commencing on the Term Commencement Date.

Tenant Improvement Allowance: $776,210.00, subject to increase as set forth below. In addition, $3,800.00 shall be provided to Tenant as an architectural allowance pursuant to the attached Exhibit C.

Special Conditions:

Capital Expenditures: Notwithstanding the provisions of Sections 6.4, during the Initial Term, no charge shall be included in Landlord's Operating Expenses or otherwise imposed on Tenant for replacement of the roof, foundation or structural frame of the Building or for the cost of repairs to those structural items that are capitalized in accordance with Generally Accepted Accounting Principles ("GAAP"), consistently applied.

TI Allowance Increase:	Tenant shall be permitted to increase the Tenant Improvement Allowance (such increase being a "TI Allowance Increase"), subject to each of the following conditions: (a) Tenant shall only be entitled to request a TI Allowance Increase before the date that is nine (9) months after the Term Commencement Date; (b) the maximum amount of the TI Allowance Increase will be $379,670.00; and (c) if Tenant Requests a TI Allowance Increase then, commencing on later of (i) the Basic Rent Commencement Date, or (ii) thirty (30) days after the signing of the amendment described below, Tenant shall pay additional Basic Rent to Landlord in equal monthly installments to amortize the full amount of the TI Allowance Increase over the remainder of the Initial Term, with an interest rate equal to 9% per annum. (In other words, the amount of the TI Allowance Increase shall be considered as though such amount were a direct reduction loan which will be repaid in full at such interest rate over the Initial Term, and with the amount of payments in each such Lease Year of the Initial Term being additional Basic Rent payable in equal monthly installments.) This provision shall be self-operative, but in confirmation hereof Tenant shall execute an amendment to this Lease setting forth the additional Basic Rent to be paid on account of the TI Allowance Increase.
Early Access Period	The time period beginning on the Date of Lease and ending on the Term Commencement Date during which period Tenant will have access to the Premises, the space below the Premises on the second floor, and loading docks "12, 13 and 14" for the construction of the Improvements as described in Section 3. During this period, Tenant will not be obligated to pay Basic Rent, Additional Rent or utilities (provided, however, that during the Early Access Period Tenant shall pay Tenant's Pro Rata Share of Additional Rent and utilities, but not Basic Rent, in respect of the Clean Room Premises).

2. Premises

In consideration of the Basic Rent, Additional Rent, and other payments and covenants of the Tenant and the Landlord hereinafter set forth, and upon the following terms and conditions, the Landlord hereby leases to the Tenant and the Tenant hereby leases from the Landlord the Premises located in the Building together with the right in common with others to use any portions of the Building and Property that are from time to time designated by Landlord for the common use of all tenants (other than the Reserved Parking Spaces, which shall be for Tenant's exclusive use) such as sidewalks, parking lots, common corridors, common elevators and Building lobbies, the cafeteria and restrooms and the three shared loading docks numbered "12, 13 and 14" located in POD LG/A8 of the Building subject always to reasonable rules and regulations established from time to time by Landlord. The current rules and regulations for the Building are attached as Exhibit A-3. If any provision of the rules and regulations conflicts with any applicable provision set forth in this Lease, then the applicable provision(s) set forth in this Lease shall govern. Subject to all of the terms and provisions of this Lease, Tenant shall have access to the Premises, the common areas, including the parking spaces, and the loading docks twenty-four hours per day, seven days per week.

Tenant warrants and represents that Tenant has had full opportunity to inspect the Premises, Building and Property and, subject to Landlord's obligations expressly set forth in this Lease, takes the Premises, Building and Property "as is, where is, with all faults". The Tenant's execution of this Lease shall be presumptive evidence that the Premises and the Building are in the condition required under this Lease subject, however, to Landlord's obligations expressly set forth in this Lease. Except as expressly set forth in this Lease, neither Landlord nor any person acting under Landlord has made any representations or promises with respect to the condition of the Premises, the Building, the Property or the fitness of any of the foregoing for Tenant's use or regarding any other matter or thing relating to any of the foregoing, and Tenant's rights with respect to the Premises, the Building, the Property and Landlord are solely and exclusively set forth in this Lease.

Landlord reserves the right from time to time, with telephonic notice and without unreasonable (except in emergency) interruption of Tenant's use: (a) to install, use, maintain, repair, replace and relocate for service to the Premises and other parts of the Building, or either, pipes, ducts, conduits, wires and appurtenant fixtures, or any other Building systems or equipment, wherever located in the Premises or the Building and (b) to alter or relocate any other common facility, including without limitation any lobby, courtyard or other common areas. Installations, replacements and relocations referred to in clause (a) above shall be located as far as practicable in the central core area of the Building, above ceiling surfaces, below floor surfaces or within perimeter walls of the Premises. Landlord shall provide Tenant with reasonable prior notice of any such activity and shall use reasonable efforts to schedule the making thereof so as to minimize to the extent practicable the interference with Tenant's business operations.

3. Construction of Improvements.

All leasehold improvements constructed by or on behalf of Tenant within the Premises ("Tenant Work") shall be done in accordance with plans and specifications prepared and stamped by a licensed architect and first approved by Landlord which approval shall not be unreasonably withheld, conditioned or delayed. Landlord shall review Tenant's construction plans and specifications as provided for below. In any event, cosmetic work such as painting, carpeting and wall coverings shall not require Landlord's consent and no prior notice to Landlord of such work is required.

Within ten (10) business days following Landlord's receipt of the plans and specifications for any Tenant Work, Landlord shall have the right to notify Tenant as to which portions of such Tenant Work must be removed by Tenant at the expiration or earlier termination of this Lease (the "Removal Items"), and the Removal Items so designated by Landlord within said ten (10) business day period shall be removed by Tenant at the expiration or earlier termination of this Lease, and Tenant shall repair any damage cause by such removal and restore that portion of the Premises to the condition the Premises were in prior to the installation of the Removal Items, reasonable wear and tear and damage by fire or other casualty or taking excepted. Other than the Removal Items, Tenant shall have no obligation, upon the expiration or earlier termination of this Lease, to remove any component of the Tenant Work or any cabling, but Tenant may remove any fixtures or equipment installed as part of the Tenant Work or remove trade fixtures that are specific to Tenant's business operations.

All Tenant Work shall be done by qualified contractors and laborers, in a good and workmanlike manner and in full compliance with this Lease and all applicable laws and lawful ordinances, regulations and orders of governmental authorities and insurers of the Building and/or the Premises. Before Tenant begins any Tenant Work, it shall (i) secure all licenses and permits necessary therefor (it being understood that Landlord shall, at Tenant's expense, cooperate with Tenant in securing all such licenses and permits), (ii) deliver to Landlord a statement with names of all its contractors and subcontractors and the estimated cost of all labor and material to be furnished by them (iii) cause each contractor and subcontractor to carry (1) workers' compensation insurance in statutory amounts and employer's liability insurance with limits not less than $1,000,000 per accident covering all the contractor's and subcontractor's employees, and (2) comprehensive general liability insurance with such limits as Landlord may reasonably require, but in no event less than $10,000,000 combined single limit for bodily injury and property damage insurance, all such insurance to include coverage for premises operations, broad form property damage, owner's and contractor's protective liability and completed operations for one (1) year; provided, however, that for Tenant's Initial Construction (as defined in Exhibit C) during the Early Access Period, the combined single limit for the comprehensive general liability insurance and umbrella excess liability insurance shall be $5,000,000, and (iv) obtain all risks property insurance against loss or damage to Tenant's work pending completion of the improvements. All insurance referred to in clauses (iii) and (iv) above shall be written by companies reasonably approved by Landlord and shall insure Landlord, Landlord's property managers and sub-managers, Mortgagees, the names and addresses of which shall be provided by Landlord to Tenant, and Tenant as additional insureds, as their respective interests may appear, as well as the contractors and subcontractors as appropriate, and all such insurance shall contain a waiver of subrogation provision in favor of all insureds and shall be primary coverage as to any other coverage maintained by any insured other than Tenant. Prior to commencing any work within the Premises, Tenant shall deliver, or arrange to be delivered, to Landlord: (a) certificates of all insurance referred to in clauses (iii) and (iv) above; and (b) a lien and completion bond, bank letter of credit, or other security satisfactory to Landlord, in an amount adequate, in Landlord's judgment, to protect Landlord against materials and mechanics' liens which may be filed in connection with such work and to insure completion of such work. The foregoing notwithstanding, Tenant agrees to promptly pay when due the entire cost of any Tenant Work, and not to cause or permit any liens for work to attach to the Premises or the Building and immediately to discharge or bond off any such liens which may attach. Landlord may inspect any Tenant Work at any reasonable time upon reasonable notice; provided, however, Landlord shall, except in case of emergency, (i) give Tenant not less than 24 hours' prior notice of such inspections and (ii) conduct such inspections so as to minimize interference with the construction work of Tenant. Tenant shall, and shall require its contractors to, insure and indemnify Landlord and hold it harmless from and against any cost, claim or liability arising from any Tenant Work, all such insurance and evidence of indemnification to be in form and substance reasonably satisfactory to Landlord.

Tenant, at Tenant's expense (but Landlord shall provide the Tenant Improvement Allowance described in Section 1 and in Exhibit C), shall perform all Tenant Work considered necessary or desirable by Tenant to make the Premises ready for Tenant's occupancy in accordance with the provisions of Exhibit C, other than the Landlord's work described on the attached Exhibit C-1. Except as otherwise provided on the attached Exhibit C-1, such Landlord's work shall be performed by Landlord (or at Landlord's direction) during the Early Access Period and completed prior to the Term Commencement Date, subject to Section 31 below.

4. Term

The Initial Term of this Lease shall commence on the Term Commencement Date and shall expire, unless earlier extended or terminated in accordance with the terms hereof, on the Termination Date. Notwithstanding the foregoing, Tenant shall have access to the Premises (and, as appropriate and with Landlord's prior written approval to the common areas of the Building) during the Early Access Period for the purpose of undertaking and completing Tenant's Initial Construction, provided that Tenant's Initial Construction shall be coordinated with Landlord's work described on the attached Exhibit C-1 so as not to unreasonably interfere with such Landlord's work, and provided further, that Tenant's Initial Construction shall include all work performed by Tenant in the Clean Room Premises. Such access shall be subject to all applicable provisions of this Lease, except that Tenant shall not be charged any Basic Rent, Additional Rent, or utilities in connection therewith. Landlord and Tenant acknowledge that Tenant requires access to the premises of another tenant in the Building in connection with Tenant's Initial Construction, and Landlord shall use commercially reasonable efforts to coordinate such efforts with such tenant (and any such access shall be subject to the applicable provisions of this Lease).

So long as Tenant is not in default beyond any applicable cure period at the time Tenant elects to extend the Term, or at the time the Term would expire but for such extension, Tenant shall have the option to extend the Term for one (1) five (5) year extension term (the "Extension Term") by unconditional notice given to Landlord at least nine (9) months before the Termination Date (the "Tenant's Extension Notice") with respect to the Premises including within such notice Tenant's estimate of Fair Market Rent, all as described below. If Tenant fails timely so to exercise its option for the Extension Term, time being of the essence, Tenant shall have no further extension rights hereunder.

During the Extension Term, Tenant shall pay Basic Rent for the first Lease Year of such Extension Term equal to the Fair Market Rent for the Premises for the first Lease Year of such Extension Term, but in no event shall Basic Rent ever be less than Basic Rent in effect with respect to the Premises during the last Lease Year of the Initial Term. During each subsequent Lease Year of the Extension Term thereafter, the annual Basic Rent shall increase by Twenty Five Cents ($0.25) per rentable square foot of the Premises. For purposes hereof, "Fair Market Rent" shall mean the then prevailing market rent taking into account all relevant factors, including without limitation, tenant improvement allowances and any concessions then being offered in the marketplace for space of comparable size, quality and location. within the Route 495 North submarket for comparable terms.

Tenant's Extension Notice shall include Tenant's estimate of Fair Market Rent. Landlord shall notify Tenant of its estimate of the Fair Market Rent within thirty (30) days after receipt of Tenant's Extension Notice. If either (y) Landlord rejects Tenant's estimate or (z) Landlord fails in writing to notify Tenant of Landlord's approval of Tenant's estimate, then the Fair Market Rent shall be arbitrated in accordance with the following procedure.

If Landlord and Tenant have not agreed on the amount of Fair Market Rent within thirty (30) days after Landlord's rejection (or deemed rejection) of Tenant's estimate thereof, or if the arbitration procedure for determination of Fair Market Rent is otherwise commenced pursuant to the prior paragraph, then the arbitration shall be conducted in daylight baseball style where each party shall submit to the arbitrator and exchange with each other in advance of the hearing a report containing their last and best estimate of the Fair Market Rent and evidence bearing on the determination of the Fair Market Rent. The arbitrator will be appointed by mutual agreement of the parties from the first or second list of arbitrators offered by the American Arbitration Association; if the parties cannot agree on the selection of the arbitrator, then the AAA will select the arbitrator. The arbitrator shall be an appraiser who shall have had at least ten (10) years experience in the leasing, ownership or management of office/manufacturing buildings similar in character to the Premises and shall be a member of A.S.R.E.C. (or successor professional organization). The arbitrator shall, within 15 days after the conclusion of the arbitration hearing, issue a written statement of decision that selects either the Landlord's or the Tenant's estimate of Fair Market Rent. The arbitration shall be conducted in accordance with the commercial arbitration rules of the AAA insofar as such rules are not inconsistent with the provisions of this Lease (in which case the provisions of this Lease shall govern). The parties shall have reasonable opportunity to present evidence bearing on Fair Market Rent. The cost of the arbitration (exclusive of each party's witness and attorneys fees, which shall be paid by such party) shall be borne equally by the parties. If the AAA shall cease to provide arbitration for commercial disputes in Boston, the second or third arbitrator, as the case may be, shall be appointed by JAMS or any successor organization to either JAMS or the AAA providing substantially the same services, and in the absence of such an organization, by a court of competent jurisdiction under the arbitration act of The Commonwealth of Massachusetts. The decision of the arbitrator shall be final and the determination of Fair Market Rent shall be binding on the parties.

If the valuation procedures of this Section are delayed for any reason, then such procedures shall nevertheless remain in effect and be applicable when and as invoked with respect to Basic Rent payable during the Extension Term; but until such procedures are completed, Tenant shall pay on account of Basic Rent at the rate established for Basic Rent for the last twelve (12) months of the Initial Term (and upon Fair Market Rent being established, Tenant shall pay the new rent within ten (10) days of such determination, retroactively to the beginning of the applicable Extension Term). The parties shall adjust for over or under payments within twenty (20) days after the decision of the arbitrators is announced.

Promptly after the Basic Rent is determined for the Extension Term as aforesaid, Landlord and Tenant shall enter into an amendment of this Lease confirming the extension of the Term and the new rate for Basic Rent.

Tenant's rights to extend the Term under this Section are personal to Tenant and shall not apply to any Transferee of Tenant (other than a Transferee under a Permitted Transfer) and shall not be assignable or exercisable by any other person or entity (other than a Transferee under a Permitted Transfer). If at any time during the Term Tenant has Transferred more than one half (1/2) of rentable square feet of the Premises (not including Permitted Transfers), then Tenant's rights under this Section shall thereafter be null and void and of no further force or effect.

5. Use of the Premises; Licenses and Permits

Tenant may use the Premises only for office, light manufacturing, wet laboratory, clean room and test/assembly purposes. The Premises may not be used for uses (a) of heavy equipment in excess of the floor load capacity of the Building or resulting in excessive wear and tear on the Building, (b) except as expressly permitted under Section 27, any use or storage of Hazardous Materials or Waste, and (c) in violation of any applicable local, state or federal law, bylaw, code, rule or regulation. In addition to and without limiting the generality of the foregoing, in no event shall the Premises be used for any heavy stamping or other operations that cause material vibrations in the ground floor manufacturing premises of Cobham Defense Electronics Systems Corporation (or any successor or assign thereof).

6. Rent

6.1 As consideration for this Lease Tenant covenants to pay to Landlord, without setoff, reduction, counterclaim or defense and, except as otherwise expressly set forth herein, without abatement, the total amounts respectively of Basic Rent and Additional Rent for the Term when due pursuant to this Lease. Tenant's obligation to pay Basic Rent shall commence on the Basic Rent Commencement Date and Tenant's obligation to pay Additional Rent shall commence on the Term Commencement Date. On the first day of each month during the Term (i) the respective amount of annual Basic Rent due for the Lease Year in question shall be paid in equal monthly installments in advance, (ii) Tenant's Pro Rata Share of Landlord's Operating Expenses and Landlord's Taxes shall be paid as Additional Rent as provided in Section 6.3 below and (iii) Tenant's Cafeteria Payment shall be paid as Additional Rent as provided in Section 6.3 below. Tenant shall make a ratable payment of Basic Rent and Additional Rent for any period of less than a month at the beginning or end of the Term. All payments of Basic Rent, Additional Rent and other sums due shall be paid in current U.S. exchange by check drawn on a federal clearinghouse bank at the address of Landlord set forth in Section 1 or such other place as Landlord may from time to time direct (or if requested by Landlord in the case of Basic Rent, by electronic fund transfer). The term "rent" as used in this Lease shall mean Basic Rent and Additional Rent and any other amount payable by Tenant under this Lease.

Without limiting the foregoing, except as expressly set forth in this Lease, Tenant's obligation so to pay rent shall not be discharged or otherwise affected by any law or regulation now or hereafter applicable to the Premises, or any other restriction on Tenant's use, or any casualty or taking, or any failure by Landlord to perform any covenant contained herein, or any other occurrence; and, except as expressly set forth in this Lease, Tenant waives all rights now or hereafter existing to terminate or cancel this Lease or quit or surrender the Premises or any part thereof, or to assert any defense in the nature of constructive eviction to any action seeking to recover Rent. Subject to the provisions of this Lease however, Tenant shall have the right to obtain judgments for direct money damages occasioned by Landlord's breach of its Lease covenants.

This Lease is intended by the parties hereto to be a so-called “triple net” lease and, to the end that the Basic Rent shall be received by the Landlord net of all costs and expenses related to the Property, the Building and the Premises, except as expressly set forth herein.

If any payment of Basic Rent or Additional Rent is not paid to the Landlord when due or within any applicable grace period expressly provided herein, then at the Landlord’s option, without notice and in addition to all other remedies hereunder, the Tenant shall pay upon demand to the Landlord as Additional Rent interest thereon at an annual rate equal to ten percent (10%) per annum or the maximum rate permitted by applicable law if less, such interest to be computed from the date such Basic Rent or Additional Rent was originally due through the date when paid in full, and if more than two (2) late payments occur within any twelve (12) month period, Landlord may in addition to all of its other remedies impose an administrative charge of five percent (5%) on the amount of any subsequent late payments, such interest and administrative charges being Additional Rent.

It is intended that rent payable hereunder shall be a net-net-net return to Landlord throughout the Term, free of expense, charge, offset, diminution or other deduction whatsoever on account of the Premises (excepting financing expenses, federal and state income taxes of general application and those expenses which this Lease expressly makes the responsibility of Landlord), and all provisions hereof shall be construed in terms of such intent.

6.2 Tenant covenants and agrees to pay to Landlord, commencing as of the date hereof with respect to the Clean Room Premises, and as of the Term Commencement Date with respect to the entire Premises, as Additional Rent, (i) an amount equal to Tenant’s Pro Rata Share of Landlord’s Operating Expenses, (ii) an amount equal to Tenant’s Pro Rata Share of Landlord’s Taxes and (iii) an amount equal to Tenant’s Cafeteria Payment. With respect to amounts payable on account of Landlord’s Operating Expenses pursuant to the foregoing clause (i), if less than the total rentable floor area of the Building is occupied at any time during such period, Landlord may reasonably extrapolate and include all components of Landlord’s Operating Expenses that vary with occupancy as though the total rentable floor area of the Building had been ninety-five percent (95%) occupied at all times during such period (that is, if actual occupancy of the Building is less than 95%, then Tenant’s Pro Rata Share of any such extrapolated variable component will be the percentage obtained by multiplying 95% by a fraction, the numerator of which is the percentage of the Building occupied by Tenant and the denominator of which is the percentage of the Building occupied by Tenant and all other tenants). For purposes hereof, “Tenant’s Cafeteria Payment” shall mean Landlord’s operating costs associated with the cafeteria multiplied by a fraction, the numerator of which is the percentage of the Building occupied by Tenant and the denominator of which is the percentage of the Building occupied by Tenant and all other tenants.

6.3 Additional Rent for Operating Expenses and Taxes and Tenant's Cafeteria Payment under this Section shall be paid for any portion of a month at the beginning of the Term and thereafter in monthly installments on the first day of each calendar month in amounts reasonably estimated from time to time by Landlord for the then current calendar year or other fiscal period. Landlord may from time to time revise such estimates based on available information relating to Landlord's Operating Expenses and Taxes and Tenant's Cafeteria Payment or otherwise affecting the calculation hereunder. Within one hundred twenty (120) days after the end of each calendar year or fiscal period, Landlord will provide Tenant with an accounting statement of Landlord's Operating Expenses and Taxes and Tenant's Cafeteria Payment and other data necessary to calculate Additional Rent hereunder for such calendar year or fiscal period prepared in reasonable "line item" detail, which statement shall be conclusive between the parties unless disputed by Tenant pursuant to Section 6.6 below. Upon issuance thereof, there shall be an adjustment between Landlord and Tenant for the calendar year or fiscal period covered by such accounting to the end that Landlord shall have received the exact amount of Additional Rent due hereunder. Any overpayments by Tenant hereunder shall be credited against the next payments of Additional Rent due under this Section, provided there are no outstanding amounts due Landlord under this Lease at such time. Any underpayments by Tenant shall be due and payable within thirty (30) days of delivery of Landlord's statement. With respect to the calendar year or fiscal period in which the Term ends, the adjustment shall be pro rated for the portion of the year included in the Term, but shall take place nevertheless at the times provided in the preceding sentences and shall survive the Term.

6.4 "Landlord's Operating Expenses" means all costs of Landlord in servicing, operating, managing, maintaining, and repairing the Building and Property, and all improvements thereon and providing services to tenants including, without limitation, the costs of the following: (i) supplies, materials and equipment purchased or rented, total wage and salary costs paid to, and all contract payments made on account of, all persons (including persons employed by Landlord or its affiliates) engaged in the operation, maintenance, security, cleaning and repair of the Building and Property, including Social Security, old age and unemployment taxes, sick and vacation pay and other so-called "fringe benefits"; (ii) building services provided pursuant to Section 10, including maintenance, repair and replacement of all components of the Building, including its structural components, roof, systems, equipment and appurtenances, planting, landscaping and grounds, roads, sidewalks and parking areas, whether performed by Landlord's or Landlord's affiliate's employees or by other persons under contract with Landlord (but excluding costs to replace the roof, foundation or structural frame of the Building during the Initial Term); (iii) utilities consumed and expenses incurred in the operation, maintenance and repair of the Building and Property including, without limitation, oil, gas, electricity, water, sewer and snow removal; (iv) casualty, liability, flood, environmental and other insurance, and unreimbursed costs incurred by Landlord which are subject to an insurance deductible; (v) management fees in the amount of and not to exceed four percent (4%) of the gross rental income and receipts of the Building and the Property and (vi) operating charges for any amenity available for use by tenants of the Building (including, without limitation, any fitness center). If Landlord, in its reasonable discretion, installs a new or replacement capital item (including, without limitation, any such capital item that is intended to improve the operating efficiency of the Building and/or the Property), the cost of such item together with interest at two percentage points above the then "Prime Rate" (as published in the Wall Street Journal or comparable financial publication reasonably selected by Landlord) considered as though such cost and interest comprised a direct reduction loan amortizing over (x) the useful life of such item or (y) with respect to any such item that is intended to improve operating efficiency, the period during which such efficiency shall be realized, as reasonably determined by Landlord, shall be included in Landlord's Operating Expenses. Landlord's Operating Expenses shall not include (i) costs of electricity or utilities furnished directly to any premises of other tenants of the Building where such utility is separately metered to such premises or such tenant pays a separate charge therefor; (ii) costs incurred in connection with Landlord's preparation, negotiation, dispute resolution and/or enforcement of leases, including court costs and attorneys' fees and disbursements in connection with any summary proceeding to dispossess any other tenant, or incurred in connection with disputes with prospective tenants, leasing agents, purchasers or mortgagees; (iii) financing costs including interest and principal amortization of debts and the costs of providing the same; (iv) any liabilities, costs or expenses associated with or incurred in connection with the removal, enclosure, encapsulation or other handling of Hazardous Materials or Wastes (as defined in Section 27 below) and the cost of defending against claims in regard to the existence or release of Hazardous Materials or Wastes at the Building or the Property (except with respect to those costs for which Tenant is otherwise responsible pursuant to the express terms of this Lease); and (vi) charitable or political contributions. Landlord's Operating Expenses shall be calculated in accordance with GAAP, consistently applied.

6.5 “Landlord’s Taxes” or “Taxes” means all taxes, assessments and similar charges assessed or imposed on the Property for the then current fiscal year by any governmental authority attributable to the Building and any associated parking structure (including personal property associated with any of the foregoing). The amount of any special taxes, special assessments and agreed or governmentally imposed “in lieu of tax” or similar charges shall be included in Landlord’s Taxes for any year but shall be limited to the amount of the installment (plus any interest, other than penalty interest, payable thereon) of such special tax, special assessment or such charge required to be paid during or with respect to the year in question. Landlord’s Taxes include expenses, including fees of attorneys, appraisers and other consultants, incurred in connection with any efforts to obtain abatements or reduction or to assure maintenance of Landlord’s Taxes for any year wholly or partially included in the Term, whether or not successful and whether or not such efforts involved filing of actual abatement applications or initiation of formal proceedings. Landlord’s Taxes exclude income taxes of general application and all estate, succession, inheritance and transfer taxes. If at any time during the Term there shall be assessed on Landlord, in addition to or lieu of the whole or any part of the ad valorem tax on real or personal property, a capital levy or other tax on the gross rents or other measures of building operations, or a governmental income, franchise, excise or similar tax, assessment, levy, charge or fee measured by or based, in whole or in part, upon building valuation, gross rents or other measures of building operations or benefits of governmental services furnished to the Building, then any and all of such taxes, assessments, levies, charges and fees, to the extent so measured or based, shall be included within the term Landlord’s Taxes, but only to the extent that the same would be payable if the Building and Property were the only property of Landlord.

6.6 At Tenant's written request at any time within three (3) months after Landlord delivers Landlord's statement of Landlord's Operating Expenses and Taxes and Tenant's Cafeteria Payment to Tenant, Tenant (at Tenant's expense) shall have the right to examine Landlord's books and records applicable to Landlord's Operating Expenses and Taxes and Tenant's Cafeteria Payment. Such right to examine the records shall be exercisable: (a) upon reasonable advance notice (which, for purposes hereof, shall mean at least thirty (30) days) to Landlord and at reasonable times during Landlord's business hours; (b) only during the five (5) month period following Tenant's receipt of Landlord's statement for the applicable calendar year and (c) not more than once each calendar year. Landlord's statement shall be deemed conclusive except as to items specifically disputed in writing by notice from Tenant to Landlord given within six (6) months after Landlord delivers the statement to Tenant. Tenant shall pay all costs of the examination unless Tenant is found to have overpaid Additional Rent for Operating Expenses and Taxes and Tenant's Cafeteria Payment by more than five percent (5%) for the year in question, in which event Landlord will be reimburse Tenant for all reasonable out-of-pocket costs of the examination in addition to any overpayment of the Additional Rent. Any examination of Landlord's Operating Expenses and Taxes shall be conducted by an independent certified public accountant retained by Tenant (each, an "examiner"). In no event shall Tenant utilize any examiner who is being paid on a contingent fee or any other basis where such examiner's fee or compensation, in whole or in part, is determined by any amount of Operating Expenses and Taxes and Tenant's Cafeteria Payment overpaid. Landlord shall reasonably approve any examiner to confirm compliance with the previous sentence. Landlord shall reasonably cooperate with Tenant and any examiner in the performance of any examination of Landlord's records pursuant to the terms hereof. Landlord and Tenant shall adjust for any overpayments or underpayments determined by examination under this Section pursuant to Section 6.3 above.

As a condition precedent to performing any such examination of Landlord's books and records, Tenant and its examiner shall be required to execute and deliver to Landlord an agreement in form acceptable to Landlord agreeing to keep confidential any information that they discover about Landlord or the Building in connection with such examination. Without limiting the foregoing, such examiners shall also be required to agree that they will not represent any other tenant in the Building in connection with examinations of Landlord's books and records for the Building unless said tenant(s) have retained said examiners prior to the date of the first examination of Landlord's books and records conducted by Tenant pursuant to this Section and have been continuously represented by such examiners since that time. Notwithstanding any prior approval of any examiners by Landlord, Landlord shall have the right to rescind such approval at any time if in Landlord's reasonable judgment the examiners have breached any confidentiality undertaking to Landlord or any other landlord or cannot provide acceptable assurances and procedures to maintain confidentiality.

7. Insurance; Waivers of Subrogation

Tenant shall, at its own cost and expense, maintain during the Term insurance for the benefit of Tenant, Landlord, any Mortgagees and property managers (as their interests may appear) from insurers rated at least A-/X by A.M. Best, with terms and coverages reasonably satisfactory to Landlord and with such increases in limits as Landlord may from time to time reasonably request provided that such limits are the same as those then being provided by similar types of tenants in the greater Boston area under leases of similar types of premises for similar uses, and/or as may be required by typical institutional lenders of comparable properties. Initially, Tenant shall maintain the following on an occurrence basis (except as otherwise expressly provided below):

(A) Commercial general liability insurance naming Landlord, Landlord's management agents and Landlord's Mortgagee(s) from time to time as additional insureds, with coverage for premises/operations, personal injury, and contractual liability with combined single limits of liability of not less than $6,000,000 for bodily injury and property damage per occurrence and $7,000,000 in the aggregate.

(B) Property insurance covering property damage and business interruption. Covered property shall include all tenant improvements in the Premises (including any Tenant Work) and Tenant's Property. Such insurance, shall name Landlord and Landlord's Mortgagees from time to time as loss payees as their interests may appear. Such insurance shall be written on an "all risk" of physical loss or damage basis including the perils of fire, extended coverage, windstorm, vandalism, and malicious mischief, and such other risks Landlord may from time to time designate (provided that insurance for such other risks is then being provided by similar types of tenants in the greater Boston area under leases of similar types of premises), for the full replacement cost value of the covered items and in amounts that meet any co-insurance clause of the policies of insurance, with a deductible amount not to exceed a then- commercially reasonable deductible, which initially shall be no greater than $100,000.

(C) Workers' compensation insurance with statutory benefits and employers' liability insurance in the following amounts: each accident, $500,000; disease (policy limit), $500,000; disease (each employee), $500,000.

(D) During all construction by Tenant, Tenant shall maintain with respect to the Premises and Property adequate builder's risk covering the cost of replacing all such construction, and Landlord its mortgagees shall be named as loss payees as their interests may appear).

On or before the Term Commencement Date and upon renewal, Tenant shall give Landlord certificate(s) evidencing the liability, builder's risk, workers' compensation insurance and property insurance on Tenant's Property evidencing such coverages, and stating that such insurance may not be canceled without at least thirty (30) days' prior written notice to Landlord. Liability insurance maintained by Tenant with respect to the Premises shall be deemed to be primary insurance, and any liability insurance maintained by Landlord with respect to the Premises shall be deemed secondary to it.

Such insurance may be provided by a combination of underlying general liability insurance coverage and umbrella excess liability insurance. The risk of loss to all contents of, and personal property and trade fixtures located in the Premises is upon the Tenant, and the Landlord shall have no liability with respect thereto, except for that due solely to the negligence of Landlord or its agents, contractors or employees.

Landlord shall maintain the following throughout the Term with companies licensed and approved to write insurance in the state in which the Building is located:

(A) property insurance against direct physical loss or damage to the Building (and parking areas to the extent such parking areas can customarily be insured against casualty) on an "all risks," agreed amount basis in an amount equal to the physical replacement cost of the Building (and, if applicable, parking areas). Landlord shall not be required to carry insurance with respect to any property that Tenant is required to insure pursuant to this Lease;

(B) liability insurance against claims, demands or actions for injury, death, and property damage in amounts not less than Five Million Dollars ($5,000,000) in the aggregate; and

(C) reasonable rental loss insurance.

The Landlord and the Tenant each hereby waive all rights against the other and release the other from any liability for any loss or damage to the Building, the Premises or other property and whether or not caused by the negligence or other fault of the Landlord, the Tenant or their respective agents, employees, subtenants, licensees, invitees or assignees; provided, however, that this waiver and release (i) shall apply notwithstanding the indemnities set forth in Section 13, but only to the extent that such loss or damage to the Building or other property is covered by insurance which protects the releasing or waiving party; (ii) shall not be construed to impose any other or greater liability upon either the Landlord or the Tenant than would have existed in the absence hereof; and (iii) shall be in effect only to the extent and so long as the applicable insurance policies provide that this release shall not affect such policies or the right of the insureds to recover under such policies, which clauses shall be obtained by the parties hereto whenever reasonably available.

Each party shall provide to the other within ten (10) days of execution of this Lease insurance certificates evidencing compliance with this Section and periodically thereafter upon reasonable request. Any failure of Tenant to carry the required insurance shall constitute a default hereunder and shall also impose on Tenant the obligations of a self-insurer to the extent of any such failure.

8. Electricity; Telecommunications and Other Utilities.

Landlord has furnished electrical service as presently installed in the Building for the operation of lighting fixtures, and 120 volt current for the operation of normal office fixtures and equipment, but excluding any high energy consumption equipment. Tenant will be allowed Tenant's Pro Rata Share of the electrical capacity of the Building (which is set forth on the attached Exhibit B). Landlord shall, at Landlord's expense, install an electrical checkmeter to measure Tenant's consumption of electricity. From and after the Term Commencement Date, Tenant shall pay to Landlord monthly as Additional Rent an amount equal to the actual number of kilowatt hours of electrical service provided to the Premises, multiplied by the average rate per kilowatt hour paid by Landlord for the Building. Tenant shall make such monthly payments in an amount reasonably estimated by Landlord based on invoices received by Landlord from the applicable service provider. Landlord may from time to time revise such estimates based on available information relating to or otherwise affecting the cost of the electrical services provided to the Premises. The difference, if any, between the amount so paid by Tenant and the actual cost of electricity used by Tenant shall be adjusted not less than annually in the manner set forth in Section 6.3 above for the annual adjustment of Additional Rent for Operating Expenses and Taxes.

Tenant agrees never to overload the electrical service and to be solely responsible for the consequences of any overloading, indemnifying and holding Landlord harmless with respect thereto in the manner provided for in Section 13 of this Lease. Tenant shall also be responsible for arranging for and paying all costs associated with telecommunications and any other utility or service required by Tenant (other than water and sewage for bathrooms and drinking fountains, which Landlord shall arrange for as an element of Landlord's Operating Expenses).

9. Tenant's Repairs and Maintenance; Security.

From and after the Term Commencement Date throughout the Term, the Tenant shall, at its own cost and expense: (i) make interior repairs, replacements and renewals necessary to keep the Premises and all equipment and appurtenances, including all systems, pipes, ducts, conduits and wires wherever located either within or, with Landlord's prior approval, outside of the Premises from the point where the same begin to exclusively serve the Premises, in good order, condition and repair consistent with the condition of the Premises at the commencement of the Term or as they thereafter may be put, reasonable wear and use (damage by fire or other casualty or taking being elsewhere provided for) and Landlord's express obligations under this Lease only excepted (it being understood, however, that the foregoing exception for reasonable wear and use shall not relieve the Tenant from the obligation to keep the Premises in good order, repair and condition), (ii) make all other repairs, replacements and renewals which are required due to the negligence or misconduct of the Tenant or those acting under Tenant or are expressly provided for elsewhere in this Lease, and (iii) keep and maintain all portions of the Premises in a reasonably clean and orderly condition, free of accumulation of dirt, rubbish, and other debris. The foregoing shall include without limitation Tenant's obligation to maintain and repair floors, floor coverings and all mechanical, plumbing, electrical and other systems and equipment that exclusively serve the Premises wherever located (whether or not the same are located inside or outside the Premises), to paint and repair walls and doors, to replace and repair ceiling tiles, interior glass (and exterior glass if such damage or repair is necessitated by any act of Tenant or person acting under Tenant), lights and light fixtures, drains, water heaters and the like, and regularly to clean the Premises. Notwithstanding the foregoing, Landlord shall provide all Building heating, ventilation and air condition ("HVAC") systems; plumbing, including water supply and drainage systems; and mechanical, electrical, lighting and life safety systems servicing the Premises in good working order on the Term Commencement Date. If any of the foregoing systems fail and need to be replaced during the Initial Term, Landlord will pay for the capital cost of replacing the system and shall amortize such cost over the useful life of the replacement system in accordance with GAAP and shall recover such cost as part of Landlord's Operating Expense.

Tenant shall be responsible for securing its Premises including implementing all security measures with respect to access thereto. Tenant shall also be responsible, on a nightly basis, for removal of trash and other rubbish from its Premises to the common area dumpsters.

All personal property of any person which is located on or near the Premises shall be at the sole risk of Tenant and subject to the insurance requirements set forth in Section 7. Landlord shall not be liable for any loss or damage to person or property resulting from any accident, theft, vandalism or other occurrence on or to the Premises, including damage resulting from water, wind, ice, steam, explosion, fire, smoke, chemicals, the rising of water or leaking or bursting of pipes or sprinklers, defect, structural or non-structural failure or any other cause except to the extent such loss or damage is caused solely and directly by Landlord's negligence.

10. Landlord's Services

10.1 Building Common Services. Landlord shall provide the services set forth in this Section 10. Landlord shall have no obligation to provide any service to the Building, Premises or Tenant that is not expressly set forth in this Lease. Without limiting the generality of the previous sentence, Tenant acknowledges and agrees that as an accommodation to Tenant and other users of the Building the central plant of the Building is used as of the date hereof to provide comfort cooling.

10.1.1 Water Charges. Landlord shall furnish potable water for ordinary office cleaning, toilet, kitchen, lavatory and drinking purposes. Landlord shall install a meter to measure the use of any such water. From and after the Term Commencement Date, Tenant shall pay to Landlord monthly as Additional Rent an amount equal to the actual amount of water provided to the Premises, multiplied by the average rate per gallon paid by Landlord for the Building. Tenant shall make such monthly payments in an amount reasonably estimated by Landlord based on invoices received by Landlord from the applicable service provider. Landlord may from time to time revise such estimates based on available information relating to or otherwise affecting the cost of the water provided to the Premises. The difference, if any, between the amount so paid by Tenant and the actual cost of water used by Tenant shall be adjusted not less than annually in the manner set forth in Section 6.3 above for the annual adjustment of Additional Rent for Operating Expenses and Taxes.

10.1.2 Cleaning. Landlord shall cause the common areas of the Building to be kept reasonably clean.

10.1.3 Other Building Services. Landlord will through the existing Building systems furnish those Building services at the capacities and in accordance with Exhibit B. Tenant will be allowed Tenant's Pro Rata Share of such Building services, and Tenant will not exceed its Pro Rata Share. Landlord will furnish the house meter for such services and Tenant will furnish appropriate metering for its consumption of such services.

10.1.4 Cafeteria. Landlord shall cause a full service cafeteria to be provided at the Building which will be generally consistent with the current cafeteria's size, scope and service.

10.1.5 Common Areas. Landlord shall light and maintain the common lobbies and related areas of the Building on business days (meaning any day of the week other than Saturday, Sunday, or a day on which banking institutions in Boston, Massachusetts or in the city in which the Property is located are obligated or authorized by law or executive action to be closed to the transaction of normal banking business) during normal business hours of 7:00 a.m. to 6:00 p.m. Notwithstanding such hours for such common areas, Tenant shall have access to the Premises on a 24 hours per day, 7 days per week basis, Tenant being responsible for providing pass cards and all security with respect to the Premises (and Landlord shall provide card access for Building perimeter doors).

10.2 Repairs and Maintenance. Except for repairs to items necessitated by Tenant's or other tenants in the Building act, neglect or overloading or the act, neglect or overloading of persons acting under Tenant (which shall be Tenant's or the other tenant's sole responsibility), Landlord shall, as expenses included in Landlord's Operating Expenses, make such repairs to the roofs, exterior walls, exterior windows of the Premises, floor slabs, core walls, and common areas and facilities in the Building (including, without limitation, the Building's mechanical, electrical, common area lighting, plumbing and life safety systems) as may be necessary to keep them in good order, condition and repair consistent with the condition at the commencement of the Term or as they thereafter may be put (except that the costs to replace the roof, foundation or structural frame of the Building during the Initial Term shall not be included in Landlord's Operating Expenses charged to Tenant). In addition, Landlord shall, as expenses included in Landlord's Operating Expenses, make improvements, alterations and additions to the Building which are directed by public authorities in order to render the same in compliance with laws, rules and directives, including the provisions of the Americans with Disability Act ("ADA") applicable to the Building common areas (but Tenant shall be responsible for compliance with the ADA applicable to the interior of the Premises or on account of its use of the Premises) as in effect and generally enforced as of the Term Commencement Date. For avoidance of doubt, Landlord shall have no maintenance, repair, replacement or other responsibility in connection with Tenant's obligations set forth under Section 9.

11. Compliance with Laws and Regulations

The Tenant agrees that its obligations to make payment of Basic Rent, Additional Rent and all other charges on its part to be paid, and to perform all of the covenants and agreements on its part to be performed during the Term hereunder shall not, except as herein set forth in the event of condemnation by public authority (which shall be subject to Section 15 below), be affected by any present or future law, by-law, ordinance, code, rule, regulation, order or other lawful requirement regulating or affecting the use which may be made of the Premises.

During the Term the Tenant shall comply, at its own cost and expense, with all applicable laws, by-laws, ordinances, codes, rules, regulations, orders, and other lawful requirements of the governmental bodies having jurisdiction, foreseen or unforeseen, which are applicable to the Premises or the fixtures and equipment therein and thereon, including, without limitation, OSHA requirements, ADA and handicap access requirements applicable to the interior of the Premises or on account of Tenant's use thereof, fire, building and safety codes; the orders, rules and regulations of the National Board of Fire Underwriters, or any other body hereafter constituted exercising similar functions, which may be applicable to the Premises, the fixtures and equipment therein or thereon or the use thereof; and the requirements of all policies of public liability, fire and all other types of insurance at any time in force with respect to the Premises, the Building or the Property and the fixtures and equipment therein and thereon.

12. Landlord's Access

The Tenant agrees to permit the Landlord and any Mortgagees and their authorized representatives to enter the Premises (i) at all reasonable times and upon reasonable advance notice during usual business hours for the purposes of inspecting the same, exercising such other rights as it or they may have hereunder or under any mortgages and exhibiting the same to other prospective tenants, purchasers or mortgagees, and (ii) at any time in the event of emergency. Landlord will comply with reasonable security measures (and Landlord acknowledges that any such measures imposed by a governmental authority shall be reasonable for purposes of this Section) of which Landlord is provided written notice from Tenant so long as the same comply with the terms of this Lease, including, without limitation, this Section; provided that in all instances Landlord shall be permitted access to the Premises (w) in the event of an emergency, (x) as required or permitted in order for Landlord to perform its obligations or exercise its rights under this Lease, (y) as required by applicable law or (z) otherwise in response to specific requests by Tenant and in accordance with a schedule reasonably designated by Tenant, subject to Landlord's reasonable approval.

13. Indemnity

Subject to the rights expressly reserved to Landlord, Tenant shall assume exclusive control of the Premises and all areas pertaining thereto including all appurtenances, improvements and equipment, and Tenant shall bear the sole risk of all related tort liabilities. Tenant agrees to protect, defend (with counsel reasonably approved by the Landlord), indemnify and save the Landlord and its Mortgagees harmless from and against any and all claims and liabilities arising (i) from the conduct or management of or from any work or thing whatsoever done in or about the Premises during the Term and from any condition existing, or any injury to or death of persons or damage to property occurring or resulting from an occurrence during the Term in or about the Premises, except for any such matter as shall arise from or due to the negligence or willful misconduct of Lessor or Lessor's employees, officers, members, agents or contractors, and (ii) from any breach or default on the part of the Tenant in performance of any covenant or agreement on the part of the Tenant to be performed pursuant to the terms of this Lease or from any negligent act or omission on the part of the Tenant or any of its agents, employees, subtenants, licensees, invitees or assignees. The Tenant further agrees to indemnify the Landlord from and against all costs, expenses (including reasonable attorneys' fees) and other liabilities incurred in connection with any such indemnified claim or action or proceeding brought thereon, any and all of which, if reasonably suffered, paid or incurred by the Landlord, the Tenant shall pay promptly upon demand to the Landlord as Additional Rent. Landlord shall give Tenant prompt written notice of any such claim. Tenant may defend such claim with counsel reasonably approved by Landlord. Without limiting in any way this indemnity and hold harmless agreement, Tenant shall have the right to settle claims for which Tenant is to indemnify and hold Landlord harmless without first obtaining a consent of Landlord to such settlement on the condition that Landlord shall incur no costs, expense, liability or damage on account of such settlement whatsoever.

The provisions of this Section shall expressly survive expiration or the earlier termination of the Lease.

14. Casualty Damage

If through no act or neglect of Tenant or persons acting under Tenant the Premises or any part thereof shall be damaged by fire or other insured casualty, then, subject to the following provisions of this Section, Landlord shall proceed with diligence, subject to then applicable laws and at the expense of Landlord (but only to the extent of insurance proceeds received and made available to Landlord by any Mortgagee) to cause to be repaired such damage, excluding any items installed or paid for by Tenant which Tenant is permitted or required to remove upon expiration of the Term (which items shall be Tenant's responsibility to repair). However, if any damage occurs through the act or neglect of Tenant or persons acting under Tenant or if any act or neglect of Tenant or such persons prevents Landlord or its Mortgagees from collecting all insurance proceeds, then the cost of repairing the casualty damage shall be paid by Tenant except to the extent any insurance proceeds are actually received by Landlord or Mortgagees (they being under no obligation to litigate their entitlement), and there shall be no abatement of rent.

Subject to the foregoing, in the event of partial or total destruction of the Premises during the Term by fire or other casualty, the Landlord shall, as promptly as practicable after receipt of any insurance proceeds available as a result of such casualty, repair, reconstruct or replace the portions of the Premises destroyed as nearly as possible to their condition prior to such destruction, except that in no event shall the Landlord be obligated to expend more for such repair, reconstruction or replacement than the amounts of any such insurance proceeds actually received plus the amount of the deductible, if any, applicable to Landlord's insurance coverage. The adjustment of any insurance loss shall be controlled by the Landlord provided that the Tenant shall reasonably cooperate with Landlord in all such activity. Commencing on the date of such casualty and during the period of such repair, reconstruction and replacement there shall be an equitable abatement of Basic Rent and Additional Rent hereunder from the date of such casualty in proportion to the loss of usable floor area in the Premises but only to the extent such abatement is covered by lost rentals insurance for the benefit of the Landlord. Without limiting the foregoing, the parties agree that such abatement shall be provided ratably to the extent portions of the Premises or parking areas shall be untenantable as a result of any damage or destruction, or any failure of Landlord to provide access to the Premises as a result of any such damage or destruction, or if there is an interruption of essential services provided by Landlord as a result of any such damage or destruction, for more than five (5) consecutive business days, or such lesser period if covered when lost rentals insurance applies, then the Basic Rent and Additional rent and any other amounts owed by Tenant to Landlord as rent shall be proportionally abated and shall not be payable with respect to such affected portion from the date of such interruption until such services or access have been restored or such damage or destruction has been repaired to such affected portion (but Tenant shall continue to pay all rent on the remaining portion of the Premises). Tenant's entry into the Premises to remove Tenant's personal property during such interruption of essential services shall not be deemed as use of the Premises and such entry shall not effect any abatement of rent.

If the Building or Premises are so extensively destroyed by fire or other casualty that an independent engineer or architect engaged by the Landlord certifies to Landlord (which certification shall be final and binding on the parties) that either cannot reasonably be expected to be susceptible of repair, reconstruction or replacement for the amount of insurance proceeds available or that such restoration, repair or replacement cannot be completed within a period of six (6) months from the date work were to commence thereon, or if any damage results from causes or risks not required to be insured against hereunder or if any Mortgagee refuses to make such net proceeds available for such repair, reconstruction or replacement, then in any such case Landlord may terminate this Lease by giving written notice to the Tenant within thirty (30) days after the date of such certification. If either (x) such repair, restoration or replacement shall not be commenced within six (6) months after the date of such fire or other casualty or (y) Landlord having commenced shall, subject always to Section 31, thereafter fail diligently to prosecute the same to completion, Tenant shall have the right after the occurrence of any such event to terminate this Lease by giving Landlord (and any Mortgagee) at least sixty (60) days prior written notice of its intent to do so. This Lease shall terminate sixty (60) days after the date of such notice to Landlord and Mortgagee, unless Landlord as the case may be commences such repair, replacement or restoration or resumes diligent prosecution of the same within said sixty (60)-day day period. All of the foregoing time periods shall be extended for any Force Majeure delays. Furthermore, notwithstanding anything contained in this Lease to the contrary, if any such fire or other casualty occurs at such time that there is less than twelve (12) months remaining in the Term of this Lease (after giving effect to any extension option actually exercised by the Tenant and not subject to any condition to its effectiveness) then the Landlord shall have no obligation hereunder if the Premises cannot reasonably be expected to be susceptible of repair, reconstruction or replacement for the amount of insurance proceeds available or if such restoration, repair or replacement cannot be completed within a period of ninety (90) days from the date work were to commence thereon.

15. Condemnation

If more than 33% of the usable floor area of the Premises is taken by eminent domain or appropriation by public authority or if the Tenant shall be deprived of suitable vehicular or pedestrian access to the Premises or the Property by virtue of such a taking or appropriation, then Landlord or the Tenant may terminate this Lease by giving written notice to the other within thirty (30) days after such taking or appropriation. In the event of such a termination, this Lease shall terminate as of the date the Tenant must surrender possession or, if later, the date the Tenant actually surrenders possession, and the Basic Rent and Additional Rent reserved shall be apportioned and paid to and as of such date.

If all or any part of the Premises is taken or appropriated by public authority as aforesaid and this Lease is not terminated as set forth above, the Landlord shall, subject to the rights of any Mortgagees, proceed on a commercially reasonable basis, apply any such damages and compensation awarded (net of the costs and expenses, including reasonable attorneys' fees, incurred by the Landlord in obtaining the same) to secure and close so much of the Premises as remain and shall restore the Building to an architectural whole and except that in no event shall the Landlord be obligated to expend more for such replacement than the net amount of any such damages, compensation or award which the Landlord may have received as damages in respect of the Building and any other improvements situated on the Property as they existed immediately prior to such taking or appropriation; in such event there shall be an equitable abatement of Basic Rent in proportion to the loss of usable floor area in the Premises after giving effect to such restoration, from and after the date the Tenant must surrender possession or, if later, the date the Tenant actually surrenders possession. If this lease is not terminated as set forth above and either (x) such repair, restoration or replacement undertaken by Landlord shall not be commenced within six (6) months after the date of such taking or (y) Landlord having commenced shall thereafter fail diligently to prosecute the same to completion, Tenant shall after the occurrence of any such event have the right to terminate this Lease by giving Landlord (and any Mortgagee) at least sixty (60) days prior written notice of its intent to do so. This Lease shall terminate sixty (60) days after the date of such notice to Landlord and any Mortgagee, unless Landlord as the case may be commences such repair, replacement or restoration or resumes diligent prosecution of the same within said sixty (60)-day day period. All of the foregoing time periods shall be extended for any Force Majeure delays. Furthermore, notwithstanding anything contained in this Lease to the contrary, if any such taking occurs at such time that there is less than twelve (12) months remaining in the Term of this Lease (after giving effect to any extension option actually exercised by the Tenant and not subject to any condition to its effectiveness) then the Landlord shall have no obligation hereunder if the Premises cannot reasonably be expected to be susceptible of repair, reconstruction or replacement for the amount of taking award available or if such restoration, repair or replacement cannot be completed within a period of ninety (90) days from me date work were to commence thereon.

The Landlord hereby reserves, and the Tenant hereby assigns to the Landlord, any and all interest in and claims to the entirety of any damages or other compensation by way of damages which may be awarded in connection with any such taking or appropriation, except so much of such damages or award as is specifically and separately awarded to the Tenant and expressly attributable to trade fixtures or moving expenses of the Tenant.

16. Landlord's Covenant of Quiet Enjoyment; Title; Mutual Authority

The Landlord covenants that the Tenant, upon paying the Basic Rent and Additional Rent provided for hereunder and performing and observing all of the other covenants and provisions hereof, may peaceably and quietly hold and enjoy the Premises for the Term as aforesaid, subject, however, to all of the terms and provisions of this Lease and all easements, restrictions, agreements, and encumbrances of record to the extent in force and applicable. This covenant is in lieu of any other so-called quiet enjoyment covenant, whether express or implied.

The Landlord and Tenant each represent and warrant to the other that each has full right, power and authority to enter into, perform and grant to the other all of the rights set forth in this Lease.

17. Tenant's Obligation to Quit

The Tenant (and all persons claiming under Tenant) shall, upon expiration of the Term or other termination of this Lease, leave and peaceably and quietly surrender and deliver to the Landlord the Premises and any replacements or renewals thereof in the order, condition and repair required of Tenant by any provisions of this Lease, except, however, that the Tenant shall (A) remove any trade fixtures, equipment and personal property, whether or not bolted or attached (including any such fixtures, equipment and personal property on the Term Commencement Date); (B) remove all of Tenant's signs wherever located; (C) remove any Removal Items that Landlord has required be removed pursuant to the terms of Section 3 hereof; (D) repair all damage which results from such removal, including the filling of all floor and wall holes, and the replacement of all damaged ceiling tiles; and (E) shall restore all portions of the Premises so damaged by Tenant's removal to a fully functional and tenantable condition, reasonable wear and tear and damage by taking and fire or casualty excepted. If the Tenant shall fail so to perform the foregoing, any property shall be deemed abandoned by the Tenant, and the Landlord may remove and dispose of the same and perform Tenant's obligations at the Tenant's expense, which covenant by Tenant to pay the same shall survive the expiration or earlier termination of this Lease.

If Tenant remains in the Premises after the termination or expiration of the Term such holding over shall be as a tenant at sufferance at a rent equal to one hundred fifty (150%) of the Basic Rent due hereunder for the last month of the Term, and otherwise subject to all the covenants and conditions of this Lease including obligations to pay Additional Rent. Notwithstanding the foregoing provisions of this paragraph, if Landlord desires to regain possession of the Premises in such event, Landlord may, at its option, re-enter and take possession of the Premises or any part thereof at any time thereafter or by any legal process in force in the state in which the Premises are located and exercise any other right or remedy permitted to it by law, and Tenant shall save Landlord harmless, indemnify and defend Landlord against any claim, loss, cost or expense in the manner elsewhere provided for in this Lease arising out of Tenant's failure promptly to vacate the Premises or any portion thereof, expressly including without limitation any damages Landlord suffers because of any termination of, or penalty amounts paid under, any successor leases of all or portions of the Premises.

The provisions of this Section shall expressly survive the termination or expiration of this Lease.

18. Transfers of Tenant's Interest

Tenant, voluntary or involuntarily, shall not assign this Lease, or sublet, license, mortgage or otherwise encumber or convey the Premises or any portion thereof, or permit the occupancy of all or any portion of the Premises other than by the Tenant (all or any of the foregoing actions are referred to as "Transfers", and all or any of assignees, transferees, licensees, and other such parties are referred to as "Transferees") without obtaining, on each occasion, the prior written consent of the Landlord, which consent shall not be unreasonably withheld, conditioned or delayed. Any Transfer without such consent shall be null and void and of no effect whatsoever. Notwithstanding the provisions of this Section, this Lease may be assigned, or the Premises may be sublet, in whole or in part, after prior notice to Landlord and compliance with the following procedures but without consent of the Landlord, (i) to any entity into or with which Tenant may be merged or consolidated or to any entity to which all or substantially all of the Tenant's assets will be transferred, or (ii) to any entity which is an affiliate, subsidiary, parent or successor of Tenant or Tenant's parent, or in which Tenant or Tenant's parent has a controlling interest, provided that in all such cases the Transferee surviving or affiliate Transferee entity shall (a) agree in writing with the Landlord to be bound by all of the terms and conditions of this Lease and (b) shall have a net worth reasonably equivalent to Tenant's net worth as of the Term Commencement Date (all of the foregoing being referred to as a "Permitted Transfer"). Tenant shall not offer to make or enter into negotiations with respect to a Transfer to any of the following: (i) a tenant in the Building; (ii) any person with whom Landlord is negotiating with respect to space in the Building; or (iii) any person which would be of such type, character or condition, including financial condition, as to be inappropriate, in Landlord's reasonable judgment, as a tenant for a first class office/manufacturing building. Tenant's request for consent to a Transfer shall include a copy of the proposed Transfer instrument together with a statement of the proposed Transfer in detail satisfactory to Landlord, together with reasonably detailed financial, business and other information about the proposed Transferee. If at any time during the final two (2) Lease Years of the Term Tenant proposes to Transfer all or any portion of the Premises and such Transfer is not a Permitted Transfer, then Tenant shall provide Landlord with written notice of its intention to do so and Landlord shall have the option (but not the obligation) to terminate the Lease with respect to all or such portion of the Premises proposed to be Transferred effective upon a date designated by Landlord that is no less than sixty (60) days but no more than ninety (90) days after Landlord receives such notice from Tenant and such termination shall continue for the remainder of the Term. Landlord shall exercise such termination right by giving Tenant notice of such termination (which shall include Landlord's designated effective termination date) within thirty (30) days after Landlord's receipt of such proposal from Tenant. If Landlord elects so to terminate this Lease with respect to all or such portion of the Premises proposed to be Transferred, then the parties shall reasonably execute an amendment to this Lease giving effect to such election. If Tenant makes a Transfer hereunder (other than a Permitted Transfer) and Landlord does not so elect to terminate this Lease with respect to all or such portion of the Premises to be Transferred, and if the aggregate rent and other charges payable to Tenant under and in connection with such Transfer (including without limitation any amounts paid for leasehold improvements or on account of Tenant's costs associated with such Transfer) exceed the sum of (x) all rent and other charges paid hereunder with respect to the space in question and (y) Tenant's reasonable out-of-pocket costs to procure the Transfer, including but not limited to free rent, brokerage commissions, tenant improvement costs and legal fees amortized on a straight-line basis over the term of the Transfer, Tenant shall pay to Landlord, as Additional Rent, fifty percent (50%) of the amount of such excess. If the amount of rent and other charges payable under a Transfer is not readily ascertainable, such amount may, at Landlord's option, be deemed to equal the fair market rent then obtainable for the space in question.

In all events including Permitted Transfers the Tenant originally named herein shall remain primarily and jointly and severally liable for, and any sublessee of all or substantially all of the Premises and assignee shall in writing assume, the obligations of the Tenant under this Lease. The foregoing provision shall be self-operative, but in confirmation thereof, such Transferee shall execute and deliver such instruments as may be reasonably required by Landlord to acknowledge such liability. Landlord may collect Rent from the Transferee and apply the net amount collected to the Rent and other charges hereunder (but only in the event of Tenant default), but no such assignment or collection shall be deemed a waiver of the provisions of this Section, or the acceptance of the Transferee as a tenant, or a release of Tenant from direct and primary liability for the further performance of Tenant's covenants hereunder. The consent by Landlord to a particular Transfer shall not relieve Tenant from the requirement of obtaining the consent of Landlord to any further Transfer. The consent by Landlord to any Transfer shall not relieve Tenant from the obligation of obtaining the express consent of Landlord to any modification of such Transfer or a further Transfer; nor shall Landlord's consent alter in any manner whatsoever the terms of this Lease, to which any Transfer at all times shall be subject and subordinate. Failure by Landlord to consent to a proposed Transferee shall never cause a termination of this Lease or subject Landlord to any damages beyond Tenant's direct costs of establishing its entitlement to such consent.

The Tenant shall reimburse to the Landlord as Additional Rent, upon demand, for any reasonable costs in an amount up to $2,500 that may be incurred by the Landlord in connection with any proposed Transfer (other than a Permitted Transfer) any request for consent thereto, including without limitation the costs of making investigations as to the acceptability of any proposed assignee or subtenant, and reasonable attorneys' fees.

19. Transfers of Landlord's Interest

The Landlord shall have the right from time to time to sell or mortgage its interest in the Property, the Building and the Premises, to assign its interest in this Lease, or to assign from time to time the whole or any portion of the Basic Rent, Additional Rent or other sums and charges at any time paid or payable hereunder by the Tenant to the Landlord, to any Mortgagees or other transferees designated by the Landlord in duly recorded instruments, and in any such case the Tenant shall pay the Basic Rent, Additional Rent and such other sums and charges so assigned, subject to the terms of the Lease, upon demand in writing to such Mortgagees and other transferees at the addresses mentioned in and in accordance with the terms of such instruments.

20. Mortgagees' Rights

Landlord agrees that within ten (10) days after the execution of this Lease, Landlord shall cause its Mortgagee to execute and deliver a subordination, non-disturbance and attornment agreement substantially in the form of Exhibit D hereto or on such Mortgagee's then-standard form. The Tenant hereby agrees that this Lease is and shall be subject and subordinate to any mortgage (and to any amendments, extensions, increases, refinancings or restructurings thereof) of the Property, the Building or the Premises, filed subsequent to the execution, delivery or the recording of any notice of this Lease (the holder from time to time of any such mortgage, including the present holder of the existing mortgage, being sometimes called the "Mortgagee"). Notwithstanding the foregoing, such subordination shall only be effective so long as any Mortgagee executes a subordination, non-disturbance and attornment agreement (or equivalent document) in the form attached as Exhibit D or such other form as Tenant and any such Mortgagee may reasonably agree upon. The Tenant hereby agrees to execute, acknowledge and deliver in recordable form such instruments confirming and evidencing the foregoing subordination in the form of agreement attached hereto as Exhibit D or such other form as Tenant and any such Mortgagee may reasonably agree upon. If Tenant fails to execute and deliver such instrument within ten (10) days of receipt from Landlord, Tenant hereby grants to Landlord and its designees a power-of-attorney coupled with an interest and with full power of substitution to execute, acknowledge and deliver such instrument in the name and on behalf of Tenant with the same effect as if such action had been taken by Tenant.

Provided that the Tenant has been provided with notice of such mortgage and appropriate addresses to which notice should be sent, no notice from the Tenant of any default by the Landlord in its obligations shall be valid, and the Tenant shall not attempt to terminate this Lease, withhold Basic Rent or Additional Rent or exercise any other remedy which may arise under law by reason of such default (it being understood that no such remedy exists, or is implied by reason of this provision, under this Lease) unless the Tenant first gives such notice to any Mortgagees and provides such Mortgagees with thirty (30) days after such notice to cure such default, or if such default is not reasonably susceptible of cure by Mortgagees (as in the case of the need to obtain possession of or right of entry into or upon the Premises) in thirty (30) days, with such longer period of time as is reasonably necessary to cure such default, provided efforts to effectuate such cure are commenced within thirty (30) days and thereafter prosecuted to completion with reasonable diligence. The Tenant shall and does hereby agree, upon default by the Landlord under any mortgage, to attorn to and recognize the Mortgagee or anyone else claiming under such mortgage, including a purchaser at a foreclosure sale, at its request as successor to the interest of the Landlord under this Lease, to execute, acknowledge and deliver such evidence of this attornment, which shall nevertheless be self-operative and automatically effective, as the Mortgagee or such successor may reasonably request and to make payments of Basic Rent and Additional Rent hereunder directly to the Mortgagee or any such successor, as the case may be, upon written request, but subject to the provisions of any applicable subordination, non-disturbance and attornment agreement. Any Mortgagee may, at any time, by giving written notice to, and without any further consent from, the Tenant, subordinate its mortgage to this Lease, and thereupon the interest of the Tenant under this Lease shall automatically be deemed to be prior to the lien of such mortgage without regard to the relative dates of execution, delivery or filing thereof or otherwise.

21. Default; Remedies

If Tenant shall default in the payment when due of any Basic Rent or Additional Rent, and such default shall continue for five (5) business days after written notice thereof from Landlord, or if Tenant shall default more than twice in any twelve (12) month period in the payment when due of any Basic Rent or Additional Rent and such default shall continue for five (5) days (without the requirement for any written notice thereof from Landlord), or if Tenant shall default in the timely performance or observance of any of the other covenants contained in this Lease on the Tenant's part to be performed or observed and shall fail, within thirty (30) days after written notice from Landlord of such default, to cure such default or if such default is not reasonably susceptible of cure within thirty (30) days, if Tenant shall fail to commence to cure within said thirty (30) days after notice of such default from Landlord or shall thereafter fail with reasonable diligence to prosecute such cure to completion, or if Tenant vacates substantially all of the Premises, or if Tenant (or any Transferee of Tenant) makes any transfer of the Premises in violation of this Lease, or if the estate hereby created shall be taken on execution, or by other process of law, or if with respect to Tenant or any guarantor or Transferee of Tenant:

(1) by its commencement of a voluntary case under Title 11 of the United States Code as from time to time in effect, or by its authorizing, by appropriate proceedings of trustees or other governing body the commencement of such a voluntary case,

(2) by its filing an answer or other pleading admitting or failing to deny the material allegations of a petition filed against it commencing an involuntary case under said Title 11, or seeking, consenting to or acquiescing in the relief therein provided, or by its failing to controvert timely the material allegations of any such petition,

(3) by the entry of an order for relief in any involuntary case commenced under said Title 11,

(4) by its seeking relief as a debtor under any applicable law, other than said Title 11, of any jurisdiction relating to the liquidation or reorganization of debtors or to the modification or alteration of the rights of creditors, or by its consenting to or acquiescing in such relief,

(5) by the entry of an order by a court of competent jurisdiction (i) finding it to be bankrupt or insolvent, (ii) ordering or approving its liquidation, reorganization or any modification or alteration of the rights of its creditors, or (iii) assuming custody of, or appointing a receiver or other custodian for, all or a substantial part of its property, or

(6) by its making an assignment for the benefit of, or entering into a composition with, its creditors, or appointing or consenting to the appointment of a receiver or other custodian for all or a substantial part of its property;

then and in any of said cases, the Landlord may, to the extent permitted by law, immediately or at any time thereafter and without demand or notice, terminate this Lease and enter into and upon the Premises, or any part thereof in the name of the whole, and repossess the same as of the Landlord's former estate, and expel the Tenant and those claiming through or under the Tenant and remove its and their effects without being deemed guilty of any manner of trespass, and without prejudice to any remedies which might otherwise be used for arrears of rent or preceding breach of covenant.

Tenant waives any statutory notice to quit and equitable rights in the nature of further cure or redemption, and Tenant agrees that upon Landlord's termination of this Lease Landlord shall be entitled to re-entry and possession in accordance with the terms hereof. Tenant further agrees that it shall not interpose any counterclaim in any summary proceeding or in any action based in whole or in part on non-payment of Rent unless the counterclaim is a compulsory counterclaim that must be alleged in the same proceeding.

No termination or repossession provided for in this Section shall relieve the Tenant of its liabilities and obligations under this Lease, all of which shall survive any such termination or repossession. In the event of any such termination or repossession, the Tenant shall pay to the Landlord either (i) in advance on the first day of each month, for what would have been the entire balance of the Term, one-twelfth (1/12) (and a pro rata portion thereof for any fraction of a month) of the annual Basic Rent, Additional Rent and all other amounts for which the Tenant is obligated hereunder, less, in each case, the actual net receipts by the Landlord by reason of any reletting of the Premises after deducting the Landlord's reasonable expenses in connection with such reletting, including, without limitation, removal, storage and repair costs and reasonable brokers' and reasonable attorneys' fees, or (ii) upon demand and at the option of the Landlord exercisable by the Landlord's giving notice to the Tenant within six (6) months after any such termination, the present value (computed at a capitalization rate based upon the so-called federal funds rate) of the amount by which the payments of Basic Rent and Additional Rent reasonably estimated to be payable for the balance of the Term after the date of the exercise of said option would exceed the payments reasonably estimated to be the fair rental value of the Premises on the terms and conditions of this Lease over such period, determined as of such date. If the Lease is terminated pursuant to this Section and Tenant vacates the Premises, Landlord shall, subject to the provisions of this sentence, use reasonable efforts to relet the Premises following any such termination and vacation of the Premises and collect the sums due to Landlord as a result of such reletting; provided, however, that any obligation imposed by law upon Landlord to relet the Premises shall be subject to the right of Landlord and its affiliates to lease other available space prior to reletting the Premises and to lease the Building in a harmonious manner with an appropriate mix of uses, tenants, floor areas and terms of tenancies, and the like.

Without thereby affecting any other right or remedy of the Landlord hereunder, the Landlord may, at its option, cure for the Tenant's account any default by the Tenant hereunder which remains uncured after said thirty (30) days' notice of default from the Landlord to the Tenant if Tenant failed to commence and diligently pursue such cure within said thirty (30) days, and the reasonable cost to the Landlord of such cure together with an administrative charge equal to fifteen (15%) percent of such cost shall be deemed to be Additional Rent and shall be paid to the Landlord by the Tenant with the installment of Basic Rent next accruing. Tenant shall pay as Additional Rent Landlord's reasonable expenses, including reasonable attorneys' fees, incurred in enforcing any obligations of Tenant under this Lease with which Tenant has failed to comply.

Nothing herein shall limit or prejudice the right of Landlord to prove and obtain in a proceeding for bankruptcy, insolvency, arrangement or reorganization, by reason of the termination, an amount equal to the maximum allowed by a statute or law in effect at the time when, and governing the proceedings in which, the damages are to be proved, whether or not the amount is greater to, equal to, or less than the amount of the loss or damage which Landlord has suffered.

22. Remedies Cumulative; Waivers

The specific remedies to which the Landlord may resort under the terms of this Lease are cumulative and are not intended to be exclusive of any other remedies or means of redress to which the Landlord may be lawfully entitled in any provision of this Lease or otherwise. The failure of the Landlord or the Tenant to insist in any one or more cases upon the strict performance of any of the covenants of this Lease, or to exercise any option herein contained, shall not be construed as a waiver or relinquishment for the future of such covenant or option. A receipt by the Landlord, or payment by the Tenant, of Basic Rent or Additional Rent with knowledge of the breach of any covenant hereof shall not be deemed a waiver of such breach, and no waiver, change, modification or discharge by the Landlord of any provision in this Lease shall be deemed to have been made or shall be effective unless expressed in writing and signed by an authorized representative of the Landlord or the Tenant as appropriate. Nor shall any endorsement or statement on any check or in any letter accompanying any check or payment be deemed an accord and satisfaction; and Landlord may accept such check or payment without prejudice to Landlord's right to recover the balance of such installment or pursue any other right or remedy. The delivery of keys (or any similar act) to Landlord shall not operate as a termination of the Term or an acceptance or surrender of the Premises. The acceptance by Landlord of any rent following the giving of any default and/or termination notice shall not be deemed a waiver of such notice.

23. Brokers

Landlord and Tenant each represent and warrant to the other that it has had no dealings with any real estate brokers or finder in connection with this Lease other than the Broker. Landlord shall indemnify, defend and hold harmless Tenant and its affiliates from any breach of such representation and warranty and Tenant shall indemnify, defend and hold harmless Landlord and its affiliates from any breach of such representation and warranty.

24. Notices

All notices and other communications hereunder shall, unless otherwise herein expressly provided, be in writing and shall be delivered by generally-recognized overnight courier service, with a copy by certified mail, return receipt requested, and shall be deemed given when so delivered or twenty-four (24) hours after so mailed, except that where any time period under this Lease is specified to commence from notice, such time period shall not be deemed to commence until such date as courier service or postal service records indicate delivery was first attempted. Notices shall be addressed as follows:

If to Landlord: 1001 Pawtucket, L.L.C.
c/o Winstanley Enterprises, Inc.
150 Baker Avenue Extension, Suite 303
Concord, MA 01742
Attn: Carter Winstanley and Barbara Green

with a copy to: DLA Piper LLP (US)
33 Arch Street, 26th Floor
Boston, MA 02110
Attn: Primo A. J. Fontana, Esq.

If to Tenant: Rapid Micro Biosystems, Inc.
1001 Pawtucket Boulevard
Suite 280 West
Lowell, Massachusetts 01854
Attn: Chief Financial Officer

Either party may change the address to which notices are to be sent to it by providing notice of same to the other party in accordance with the provisions of this Section.

25. Estoppel Certificates

The Tenant hereby agrees from time to time, after not less than ten (10) days' prior written notice from Landlord or any Mortgagee, to execute, acknowledge and deliver, without charge, to Landlord, the Mortgagee or any other person designated by Landlord, a statement in writing certifying: that this Lease is unmodified and in full force and effect (or if there have been modifications, identifying the same by the date thereof and specifying the nature thereof); that to the knowledge of Tenant there exist no defaults (or if there be any defaults, specifying the same); the amount of the Basic Rent, the dates to which the Basic Rent, Additional Rent and other sums and charges payable hereunder have been paid; that such party to its knowledge has no claims against the other party hereunder except for the continuing obligations under this Lease (or if such party has any such claims, specifying the same) and other matters that may reasonably be requested by the requesting party. Such statement shall be in the form attached as Exhibit E or such other form as may reasonably be requested by the requesting party. Failure of Tenant to comply with this Section shall constitute a default unless cured within a further ten (10) days' following notice of such default.

26. Bind and Inure: Limited Liability of Landlord

All of the covenants, agreements, stipulations, provisions, conditions and obligations herein expressed and set forth shall be considered as running with the land and shall extend to, bind and inure to the benefit of the Landlord and the Tenant, which terms as used in this Lease shall include their respective successors and assigns where the context hereof so admits.

The term “Landlord” as used in this Lease shall refer only to the owner or owners from time to time of the Property or the Building, it being understood that no such owner shall have any liability hereunder for matters arising from and after the date such owner ceases to have any interest in the Property or the Building, Tenant agreeing that Landlord shall be liable only for breaches of its covenants occurring while it is owner of the Premises. Tenant (and each person acting under Tenant) agrees to look solely to Landlord’s interest from time to time in the Property for satisfaction of any claim against Landlord or any affiliate of Landlord. No trustee, beneficiary, partner, manager, member, agent or employee of Landlord or of any affiliate of Landlord (or of any Mortgagee) shall ever be personally or individually liable; nor shall it or they ever be answerable or liable in any equitable judicial proceeding or order beyond the extent of their interest in the Premises. Any lien obtained to enforce any judgment against Landlord shall be subject and subordinate to any mortgage encumbering the Premises.

In no event shall the Landlord be liable to the Tenant (or any person claiming under Tenant) for any special, consequential or indirect damages suffered by any person or entity by reason of a default by the Landlord under any provisions of this Lease. It is expressly agreed by Landlord and Tenant that business interruption costs and expenses are indirect and consequential damages under the terms of this Lease.

27. No Waste; Environmental Compliance

Tenant shall not itself, nor shall Tenant permit or suffer persons acting under Tenant to, either with or without negligence, injure, overload, deface, damage or otherwise harm the Property, the Premises or any part or component thereof; commit any nuisance; or permit any noise or odors to emanate beyond the Premises; or permit any waste whatsoever to the Property or the Premises. Tenant represents, warrants and covenants to Landlord that at all times during the Term Tenant (and persons acting under Tenant) will not generate, manufacture, store or otherwise handle any Hazardous Materials or Wastes in the Building, the Premises or on the Property, except those as set forth on Exhibit F hereto used in reasonable amounts in the conduct of Tenant's business and in compliance with all applicable laws (which Exhibit F may be updated from time to time as agreed upon by Landlord and Tenant). In addition to and not in limitation of the foregoing, Tenant covenants to Landlord that: (a) Tenant (and persons acting under Tenant) shall (i) comply with all Laws applicable to the discharge, generation, manufacturing, removal, transportation, treatment, storage, disposal and handling of Hazardous Materials or Wastes as apply to the activities of the Tenant (and persons acting under Tenant), its (and their) directors, officers, employees, agents, contractors, subcontractors, licensees, invitees, successors and assigns at the Premises, but only with respect to any Hazardous Materials or Waste introduced to, generated at or released from the Property by Tenant (and persons acting under Tenant) or any of the foregoing persons or entities; (ii) remove any Hazardous Materials or Wastes from the Premises which were introduced to, generated at, or released from the Premises by Tenant (and persons acting under Tenant) or any of the foregoing persons or entities in accordance with all applicable Laws and orders of governmental authorities having jurisdiction, (iii) pay or cause to be paid all costs associated with such removal including restoration of the Premises, and (iv) indemnify Landlord from and against all losses, claims and costs, in accordance with the final paragraph of this Section; (b) Tenant shall keep the Property free of any lien imposed pursuant to any applicable Law in connection with the existence of Hazardous Materials or Wastes in or on the Premises, but only with respect to any Hazardous Materials or Waste introduced to, generated at or released from the Property by Tenant (and persons acting under Tenant) or any of the foregoing persons or entities; (c) Tenant (and persons acting under Tenant) shall not install or permit to be installed in the Premises any asbestos, asbestos-containing materials, urea formaldehyde insulation or, except as set forth on Exhibit F to allow to exist, any other chemical or substance which has been determined to be a hazard to health and environment except in accordance with all applicable Laws and orders of governmental authorities having jurisdiction; (d) Tenant (and persons acting under Tenant) shall not cause or permit to exist, as a result of an intentional or unintentional act or omission on the part of Tenant or any occupant of the Premises, a releasing, spilling, leaking, pumping, emitting, pouring, discharging, emptying or dumping of any Hazardous Materials or Wastes onto the Premises, but only with respect to any Hazardous Materials or Waste introduced to, generated at or released from the Property by Tenant (and persons acting under Tenant) or any of the foregoing persons or entities; (e) Tenant shall give all notifications and prepare all reports required by Laws or any other law with respect to Hazardous Materials or Wastes existing on, released from or emitted from the Premises; (f) promptly upon Tenant (and persons acting under Tenant) obtaining actual knowledge of the existence of the same, Tenant (and persons acting under Tenant) shall promptly notify Landlord in writing of any release, spill, leak, emittance, pouring, discharging, emptying or dumping of Hazardous Materials or Wastes in or on the Premises which is required to be reported to any governmental authority pursuant to any applicable Law; and (g) Tenant (and persons acting under Tenant) shall promptly notify Landlord in writing of any summons, citation, directive, notice, letter or other communication, written or oral, from any local, state or federal governmental agency, or of any claim or threat of claim known to Tenant (and persons acting under Tenant), made by any third party relating to the presence or releasing, spilling, leaking, pumping, emitting, pouring, discharging, emptying or dumping of any Hazardous Materials or Wastes onto the Premises. The foregoing covenants shall not apply to Hazardous Materials or Wastes existing in, at, under or emenating from the Premises, the Building or the Property at any time as a result of the act or negligence of Landlord, or any of Landlord's partners, employees, agents, contractors, subcontractors, licensees, invitees or any Uninvited Third Party. For purposes of this Section, "Uninvited Third Party" shall mean any person who entered or enters upon the Premises or Property without invitation or permission and releases Hazardous Materials or Wastes provided that such is not a result respectively of the negligence of Landlord or Tenant (and persons acting under Tenant), or any of Landlord's or Tenant's partners, employees, agents, contractors, subcontractors, licensees, invitees (or those of persons acting under Tenant).

The term “Hazardous Materials or Wastes” shall mean any hazardous or toxic materials, pollutants, chemicals, or contaminants, including without limitation asbestos, asbestos- containing materials, urea formaldehyde foam insulation, polychlorinated biphenyls (PCBs) and petroleum products as defined, determined or identified as such in any laws, as hereinafter defined. Without limitation, Hazardous Materials or Wastes shall include all substances described in the Clean Water Act, 33 U.S.C. § 1251 et seq. (1972), the Clean Air Act, 42 U.S.C. § 7401 et seq. (1970), the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C., and The Resource Conservation and Recovery Act, 42 U.S.C. Subsection 6901 et seq.; in the Hazardous Materials Transportation Act; in the Massachusetts Hazardous Waste Management Act, as amended, M.G.L. Chapter 21, and the Massachusetts Oil and Hazardous Material Release Prevention Act, as amended, M.G.L. Chapter 21E and all other federal, state and local laws governing similar matters as they may be amended from time to time as well as any judicial or administrative interpretation thereof, including any judicial or administrative orders or judgments. Tenant shall execute affidavits, representations and the like from time to time at Landlord’s request concerning Tenant’s best knowledge and belief regarding the presence or absence of Hazardous Materials or Wastes on the Premises or the Property.

Tenant hereby agrees to defend, indemnify and hold harmless Landlord, its mortgagees, employees, agents, contractors, subcontractors, licensees, invitees, successors and assigns from and against any and all claims, losses, damages, liabilities, judgments, costs and expenses (including, without limitation, attorneys’ fees and costs incurred in the investigation, defense and settlement of claims or remediation of contamination) incurred by such indemnified parties as a result of the acts of Tenant or persons acting under Tenant with respect to the presence at or removal of Hazardous Materials or Wastes from the Premises (except for Hazardous Materials or Wastes existing in or at the Premises, Building or Property prior to the date of this Lease and not released by, through or under Tenant or existing in, on, under or emanating from the Premises, the Building or the Property at any time as a result of the act or negligence of Landlord, or any of Landlord’s partners, employees, agents, contractors, subcontractors, licensees, invitees, successors or assigns including as a result of the construction of the Building Improvements) or as a result of or in connection with activities prohibited under this Section. Tenant shall bear, pay and discharge, as and when the same become due and payable, any and all such judgments or claims for damages, penalties or otherwise against such indemnified parties, shall hold such indemnified parties harmless against all claims, losses, damages, liabilities, costs and expenses, and shall assume the burden and expense of defending all suits, administrative proceedings, and negotiations of any description with any and all persons, political subdivisions or government agencies arising out of any of the occurrences set forth in this Section. Landlord shall give Tenant prompt written notice of any such claim. Tenant may defend such claim with responsible counsel of its own choosing. Without limiting in any way this indemnity and hold harmless agreement, Tenant shall have the right to settle claims for which Tenant is to indemnify and hold harmless without first obtaining the consent of Landlord to such settlement on the condition that Landlord shall incur no cost, expense, liability or damage on account of such settlement whatsoever to any party, and Tenant shall indemnify and hold harmless Landlord from all such costs, expenses, liabilities and damages on account of such settlement.

To the knowledge of Landlord, (i) no Hazardous Materials or Wastes requiring remediation or investigation under applicable environmental laws are present on the Property or the soil, surface water or groundwater thereof and (ii) no action, proceeding or claim is pending or threatened regarding the Property concerning any Hazardous Materials or Wastes or pursuant to any environmental law. Landlord shall, as and to the extent required by applicable law, following notice by Tenant remove or remediate (or cause the responsible party to remove or remediate) any Hazardous Materials or Wastes located in the Premises or Building that affect Tenant's use of the Premises or portions of the Building as to which Tenant has appurtenant rights under the Lease. The foregoing covenant shall not apply to any Hazardous Materials or Wastes that exist in the Premises or the Building as a result of any act or omission of Tenant, its employees, agents, or guests, Tenant's architect, Tenant's contractors, or any persons acting under or through Tenant. Landlord shall indemnify Tenant from any breach of the representation in the first sentence of this paragraph and from any failure to remove or remediate as provided above and hereby agrees to defend, indemnify and hold harmless Tenant, its directors, officers, employees, agents, contractors, subcontractors, licensees, invitees, successors and assigns from and against any and all claims, losses, damages, liabilities, judgments, costs and expenses (including, without limitation, reasonable third party attorneys' fees and costs incurred in the investigation, defense and settlement of claims or remediation of contamination) incurred by such indemnified parties as a result of the acts or the failure to act of Landlord or persons acting under Landlord with respect to the presence at or removal of Hazardous Materials or Wastes from the Premises.

28. Applicable Law and Construction

This Lease may be executed in counterparts, shall be construed as a sealed instrument, and shall be governed exclusively by the provisions hereof and by the laws of the state where the Property is located without regard to principles of choice of law or conflicts of law. A facsimile signature to this Lease shall be sufficient to prove the execution by a party. The covenants of Landlord and Tenant are independent, and such covenants shall be construed as such in accordance with the laws of The Commonwealth of Massachusetts. If any provisions shall to any extent be invalid, the remainder shall not be affected. Other than contemporaneous instruments executed and delivered of even date, if any, this Lease contains all of the agreements between Landlord and Tenant relating in any way to the Premises and supersedes all prior agreements and dealings between them. There are no oral agreements between Landlord and Tenant relating to this Lease or the Premises. This Lease may be amended only by instrument in writing executed and delivered by both Landlord and Tenant. The provisions of this Lease shall bind Landlord and Tenant and their respective successors and assigns, and shall inure to the benefit of Landlord and its successors and assigns and of Tenant and its permitted successors and assigns. Where the phrases "persons acting under" Landlord or Tenant or "persons claiming through" Landlord or Tenant or similar phrases are used, the persons included shall be assignees, sublessees, licensees or other Transferees or successors of Landlord or Tenant as well as invitees or independent contractors of Landlord or Tenant, and all of the respective employees, servants, contractors, agents and invitees of Landlord, Tenant and any of the foregoing. As used herein, "non-monetary default" shall mean a default that cannot be substantially cured by the payment of money. The titles are for convenience only and shall not be considered a part of the Lease. This Lease shall not be construed more strictly against one party than against the other merely by virtue of the fact that it may have been prepared primarily by counsel for one of the parties, it being recognized that both Landlord and Tenant have contributed substantially and materially to the preparation of this Lease. If Tenant is granted any extension or other option, to be effective the exercise (and notice thereof) shall be unconditional; and if Tenant purports to condition the exercise of any option or to vary its terms in any manner, then the option granted shall be void and the purported exercise shall be ineffective. The enumeration of specific examples of a general provisions shall not be construed as a limitation of the general provision. Unless a party's approval or consent is required by the express terms of this Lease not to be unreasonably withheld, such approval or consent may be withheld in the party's sole discretion. The submission of a form of this Lease or any summary of its terms shall not constitute an offer by Landlord to Tenant; but a leasehold shall only be created and the parties bound when this Lease is executed and delivered by both Landlord and Tenant and approved by the holder of any mortgagee of the Premises having the right to approve this Lease. Nothing herein shall be construed as creating the relationship between Landlord and Tenant of principal and agent, or of partners or joint venturers or any relationship other than landlord and tenant. This Lease and all consents, notices, approvals and all other related documents may be reproduced by any party by any electronic means or by facsimile, photographic, microfilm, microfiche or other reproduction process and the originals may be destroyed; and each party agrees that any reproductions shall be as admissible in evidence in any judicial or administrative proceeding as the original itself (whether or not the original is in existence and whether or not reproduction was made in the regular course of business), and that any further reproduction of such reproduction shall likewise be admissible. If any payment in the nature of interest provided for in this Lease shall exceed the maximum interest permitted under controlling law, as established by final judgment of a court, then such interest shall instead be at the maximum permitted interest rate as established by such judgment. Landlord and Tenant expressly agree that there are and shall be no implied warranties of merchantability, habitability, suitability, fitness for a particular purpose or of any other kind arising out of this Lease, and there are no warranties that extend beyond those expressly set forth in this Lease.

29. Memorandum of Lease.

This Lease shall not be recorded in the land records. Within fifteen (15) days after the written request of either party, Landlord and Tenant agree to execute and acknowledge and Tenant may record in the land records a memorandum of the basic terms of this Lease, including, the Term, rights to extend the Term, rights and obligations of the parties with respect to assignment and sublease of Tenant's interest in the Lease and right of first refusal. At the expiration or earlier termination of the Term, Landlord and Tenant shall execute and acknowledge for recording a termination of any recorded memorandum of lease, Tenant hereby constituting Landlord and its successors and assigns as its attorney in fact with full power of substitution to so execute and acknowledge such termination if Tenant fails so to do within ten (10) days. This provision shall expressly survive expiration or the earlier termination of the Lease.

30. Intentionally omitted.

31. Payments; Force Majeure

Except as set otherwise set forth in this Lease with respect to payments due earlier, any payment due hereunder shall be due within thirty (30) days following demand therefor. If a party cannot perform its obligations due to causes or events beyond its reasonable control (other than the inability to make payments when due, including paying rent), the time provided for performing such obligations shall be extended by a period of time equal to the duration of such causes or events. Causes or events beyond a party's reasonable control include acts of God, war, civil commotion, labor disputes, strikes, public disturbances, fire, flood or other casualty, shortages of or the inability to obtain labor or material from customary sources on customary terms, government regulation or restriction, weather conditions and acts, neglects or delays of the other party. The foregoing two sentences comprise the definition of "Force Majeure."

32. Signs

No sign, name, placard, advertisement or notice visible from the exterior of the Premises shall be inscribed, painted or affixed by Tenant on any part of the Building without the prior written approval of Landlord. All signs or letterings on doors, or otherwise, approved by Landlord, shall be inscribed, painted or affixed by a person reasonably approved by Landlord and at the sole cost and expense of Tenant. Notwithstanding the foregoing, Landlord will provide, at Landlord's expense, (x) a sign on the shared monument sign in front of the Building (the size of such space to be reasonably appropriate based on Tenant's Pro Rata Share) so long as no Transfer (other than a Permitted Transfer) or default by Tenant occurs, (y) entry signage to the Premises in Building standard size, location and design and (z) signage in the west lobby of the Building in Building standard size, location and design.

Notwithstanding the foregoing, Tenant shall upon compliance with all applicable laws, including town bylaws and so long as no Transfer (other than a Permitted Transfer) or default by Tenant occurs, have the right to install a sign on the side of the Building in a location designated by Landlord on the exterior façade of the Building at the main entrance of the west side of the Building at Tenant's expense, subject to Landlord's prior reasonable approval of the design of such sign and subject to compliance with all applicable legal requirements. Tenant shall keep such sign in good condition and repair at Tenant's expense. At the expiration or earlier termination of this Lease, Tenant shall, at its sole cost and expense, remove such sign and repair and restore the area where such sign is installed to Landlord's reasonable satisfaction and leave such area in good order and repair, reasonable wear and tear excepted.

33. Intentionally omitted

34. Financial Statements

Tenant shall furnish to Landlord within one hundred twenty (120) days after each of Tenant's fiscal years during the Term an accurate, up-to-date, audited if available, financial statement of Tenant showing Tenant's financial condition for the preceding fiscal year. If not so furnished, Tenant shall furnish the same to Landlord within fifteen (15) days of Landlord's request therefor. If no audited financial statement is prepared, such statement will be certified by the CFO or Treasurer of Tenant. Unless public by other means, Landlord will maintain confidential such statement, except as required by an applicable law or court order; however Landlord may provide such statements to Landlord's prospective and actual lenders and purchasers, and its and their accountants, attorneys and partners, as long as Landlord advises the recipients of the existence of Landlord's confidentiality obligation. So long as Tenant is a publicly-traded company that makes public reports as required by the Securities and Exchange Commission, those publicly-available reports shall satisfy all obligations of Tenant under this Section.

35. Waiver of Jury Trial; Other

LANDLORD AND TENANT AGREE THAT TO EXTENT PERMITTED BY LAW, EACH SHALL AND HEREBY DOES WAIVE TRIAL BY JURY IN ANY ACTION, PROCEEDING OR COUNTERCLAIM BROUGHT BY EITHER AGAINST THE OTHER ON ANY MATTER WHATSOEVER ARISING OUT OF OR IN ANY WAY CONNECTED WITH THIS LEASE, THE RELATIONSHIP OF LANDLORD AND TENANT, TENANT'S USE OR OCCUPANCY OF THE PREMISES AND/OR EMERGENCY OR STATUTORY REMEDY. Nothing in this Lease shall limit the right of Landlord to prove and obtain in proceedings for bankruptcy or insolvency an amount equal to the maximum allowed by any statute or rule of law in effect at the time; and Tenant agrees that the fair value for occupancy of all or any part of the Premises at all times shall never be less than the Basic Rent and all Additional Rent payable from time to time. Tenant shall also indemnify and hold Landlord harmless in the manner provided in Section 14 if Landlord shall become or be made a party to any claim or action (a) instituted by Tenant against any third party, or by any third party against Tenant, or by or against any person claiming through or under Tenant; (b) for foreclosure of any lien for labor or material furnished to or for Tenant or such other person; (c) otherwise arising out of or resulting from any act or transaction of Tenant or such other person; or (d) necessary to protect Landlord's interest under this Lease in a bankruptcy proceeding, or other proceeding under Title 11 of the United States Code, as amended. Landlord and Tenant further agree that any action arising out of this Lease (except an action for possession by Landlord, which may be brought in whatever manner or place provided by law) shall be brought in the Trial Court of the Commonwealth of Massachusetts, Superior Court Department, in the county where the Premises are located.

36. Security Deposit

Tenant shall provide to Landlord a clean, irrevocable letter of credit as security for the performance of the obligations of Tenant under this Lease, subject to the terms and conditions set forth in this Section (together with any renewal or replacement thereof in accordance herewith, the "Letter of Credit"). Tenant shall provide the Letter of Credit to Landlord upon Tenant's execution of this Lease, in the amount of Two Hundred Fifty Thousand Dollars ($250,000) ("Original Amount"). Any Letter of Credit delivered hereunder shall comply with the requirements of this Section.

If Landlord has not previously drawn on the Letter of Credit, Tenant is not then in default under the Lease, and no event or condition then exists which with notice and the passage of time would give rise to such a default, then Tenant may decrease the amount of the Letter of Credit required to be maintained hereunder to the amounts on the dates set forth in the following schedule, and upon Tenant's request Landlord shall provide such confirmation or acknowledgement as Tenant may reasonably request to effect such reduction of the Letter of Credit:

Original Amount:	$250,000
First Day of Lease Year 3:	$150,000
First Day of Lease Year 5:	$100,000

The Letter of Credit (i) shall be irrevocable and shall be issued by Silicon Valley Bank or another commercial bank reasonably acceptable to Landlord that has an office in Boston, Massachusetts or New York City that accepts requests for draws on the Letter of Credit, (ii) shall require only the presentation to the issuer of a notice from the holder of the Letter of Credit stating that Landlord is entitled to draw on the Letter of Credit pursuant to the terms of the Lease, (iii) shall be payable to Landlord or its successors in interest as the Landlord and shall be freely transferable without cost to any such successor or any lender holding a collateral assignment of Landlord's interest in the Lease, (iv) shall be for an initial term of not less than one year and contain a provision that such term shall be automatically renewed for successive one-year periods unless the issuer shall, at least forty five (45) days prior to the scheduled expiration date, give Landlord notice of such nonrenewal, and (v) shall otherwise be in form and substance reasonably acceptable to Landlord. Notwithstanding the foregoing, the term of the Letter of Credit for the final period shall be for a term ending not earlier than the date thirty (30) days after the last day of the Term. In the event that the issuer ceases to be reasonably acceptable to Landlord, due to a deterioration in its financial condition or change in status that threatens to compromise Landlord's ability to draw on the Letter of Credit as determined in good faith by Landlord, then Tenant shall provide a replacement Letter of Credit from an issuer satisfying the terms of this Exhibit within thirty (30) days after Landlord's notice of such event.

Landlord shall be entitled to draw upon the Letter of Credit for its full amount or any portion thereof if (a) Tenant shall fail to perform any of its obligations under the Lease after the expiration of any applicable notice and cure period, or fail to perform any of its obligations under the Lease and transmittal of a default notice is barred by applicable law, or fail to perform any of its obligations under the Lease and any applicable notice and cure period would expire prior to the expiration of the Letter of Credit, or (b) not less than thirty (30) days before the scheduled expiration of the Letter of Credit, Tenant has not delivered to Landlord a new Letter of Credit in accordance with this Section. Without limiting the generality of the foregoing, Landlord may, but shall not be obligated to, draw on the Letter of Credit from time to time in the event of a bankruptcy filing by or against Tenant and/or to compensate Landlord, in such order as Landlord may determine, for all or any part of any unpaid rent, any damages arising from any termination of the Lease in accordance with the terms of the Lease, and/or any damages arising from any rejection of the Lease in a bankruptcy proceeding commenced by or against Tenant. Landlord may, but shall not be obligated to, apply the amount so drawn to the extent necessary to cure Tenant's failure.

Any amount of the Letter of Credit drawn in excess of the amount applied by Landlord to cure any such failure shall be held by Landlord as a cash security deposit for the performance by Tenant of its obligations under the Lease. Any cash security deposit may be mingled with other funds of Landlord and no fiduciary relationship shall be created with respect to such deposit, nor shall Landlord be liable to pay Tenant interest thereon. If Tenant shall fail to perform any of its obligations under this Lease, Landlord may, but shall not be obliged to, apply the cash security deposit to the extent necessary to cure Tenant's failure. After any such application by Landlord of the Letter of Credit or cash security deposit, as the case may be, Tenant shall reinstate the Letter of Credit to the amount originally required to be maintained under the Lease, upon demand. Provided that Tenant is not then in default under the Lease, and no condition exists or event has occurred which after the expiration of any applicable notice or cure period would constitute such a default, within thirty (30) days after the expiration or sooner termination of the Term the Letter of Credit and any cash security deposit, to the extent not applied, shall be returned to the Tenant, without interest.

In the event of a sale of the Building or lease, conveyance or transfer of the Building, Landlord shall transfer the Letter of Credit or cash security deposit to the transferee. Upon such transfer, the transferring Landlord shall be released by Tenant from all liability for the return of such security, and Tenant agrees to look to the transferee solely for the return of said security. The provisions hereof shall apply to every transfer or assignment made of the security to such a transferee. Tenant further covenants that it will not assign or encumber or attempt to assign or encumber the Letter of Credit or the monies deposited herein as security, and that neither Landlord nor its successors or assigns shall be bound by any assignment, encumbrance, attempted assignment or attempted encumbrance.

37. Decommissioning

Prior to the expiration of this Lease (or within thirty (30) days after any earlier termination), Tenant shall clean and otherwise decommission all interior surfaces (including floors, walls, ceilings, and counters), piping, supply lines, waste lines and plumbing in and/or exclusively serving the Premises, and all exhaust or other ductwork in and/or exclusively serving the Premises, in each case which has carried or released or been exposed to any Hazardous Materials or Wastes so as to permit the report hereinafter called for by this Section to be issued.

Without limiting the generality of the foregoing, the areas subject to such cleaning, decommissioning and reporting shall include chemical storage areas and containers and pipes and ducts exposed to Hazardous Materials or Wastes. Prior to the expiration of this Lease (or within thirty (30) days after any earlier termination), Tenant, at Tenant's expense, shall obtain for Landlord a report addressed to Landlord and its Mortgagee (and, at Tenant's election, Tenant) by a reputable licensed site professional (LSP) that is designated by Tenant and acceptable to Landlord in Landlord's reasonable discretion, which report shall be based on the environmental engineer's inspection of the Premises and shall show:

(i) that the Hazardous Materials or Wastes, to the extent, if any, existing prior to such decommissioning, have been removed as necessary so that the interior surfaces of the Premises (including floors, walls, ceilings, and counters), piping, supply lines, waste lines and plumbing, and all such exhaust or other ductwork in and/or exclusively serving the Premises, may be reused by a subsequent tenant or disposed of in compliance with applicable Environmental Laws without taking any special precautions for Hazardous Materials or Wastes, without incurring special costs or undertaking special procedures for demolition, disposal, investigation, assessment, cleaning or removal of Hazardous Materials or Wastes and without incurring regulatory compliance requirements or giving notice in connection with Hazardous Materials or Wastes; and

(ii) that the Premises may be reoccupied for the Permitted Uses described in Section 5, or demolished or renovated without taking any special precautions for Hazardous Materials or Wastes, without incurring special costs or undertaking special procedures for disposal, investigation, assessment, cleaning or removal of Hazardous Materials or Wastes and without incurring regulatory requirements or giving notice in connection with Hazardous Materials or Wastes.

For purposes of clause (ii) above: "special costs" or "special procedures" shall mean costs or procedures, as the case may be, that would not be incurred but for the nature of the Hazardous Materials or Wastes as Hazardous Materials or Wastes instead of non-hazardous materials. The report shall include reasonable detail concerning the clean-up location, the tests run and the analytic results.

If Tenant fails to perform its obligations under this Section, without limiting any other right or remedy, Landlord may, on five (5) business days' prior written notice to Tenant perform such obligations at Tenant's expense, and Tenant shall promptly reimburse Landlord as additional rent upon demand for all costs and expenses reasonably incurred together with an administrative charge equal to ten percent (10%) of such costs and expenses.

To the extent that Tenant surrenders any portion of the Premises to Landlord, Tenant's obligations under this Section shall apply with respect to such surrendered portion of the Premises at the time of such surrender, and such surrender shall not be deemed to have occurred until Tenant's obligations under this Section shall have been satisfied.

Tenant's obligations under this Section shall survive the expiration or earlier termination of this Lease.

38. Rooftop Equipment.

Subject to the following provisions of this Section, Tenant shall have the right to install, operate and maintain, on the roof of the Building (the "Roof Premises") at Tenant's expense and risk, a lawfully permitted satellite dish and associated equipment, a back-up generator and cables, a compressed air system and a chiller with chiller lines (collectively, the "Rooftop Equipment"), subject to Landlord's approval of the size, weight and location of same.

(a) If the weight of any of the Rooftop Equipment exceeds the live load bearing capacity of the roof, Tenant's plans and specifications for the installation thereof shall include details of structural engineering and structural reinforcement so as to ensure the structural integrity of the roof upon installation of the Rooftop Equipment.

(b) Tenant shall submit to Landlord for its approval, a full set of engineering plans and specifications for the proposed Rooftop Equipment installation.

(c) Tenant shall make all required conduit and/or cable connections between Tenant's equipment in the Premises and the Rooftop Equipment subject to approval of such connections by Landlord.

(d) Tenant shall obtain all necessary municipal, state and federal permits and authorizations required to install, maintain and operate the Rooftop Equipment and pay any changes levied by any governmental agencies which are the result of the Rooftop Equipment and/or the installation and/or use thereof.

(e) Tenant shall maintain the Roof Premises and the Rooftop Equipment in a good state of repair.

(f) Tenant shall use (at Tenant's cost) Landlord's roof contractor to perform and repair any penetrations necessary to the roof in connection with the installation and removal of the Rooftop Equipment. In no event will Tenant be authorized to make any penetrations that would void Landlord's roof warranty.

(g) At the expiration or earlier termination of this Lease, Tenant shall remove the Rooftop Equipment and surrender and restore the Roof Premises to Landlord in substantially as good condition as when entered.

(h) The liability insurance to be carried by Tenant shall include coverage for any activity on the Roof Premises. Tenant shall pay any increase in rates for Landlord's insurance resulting from the installation and use of the Roof Premises and/or the Rooftop Equipment by Tenant.

(i) The Rooftop Equipment shall be utilized solely on behalf of Tenant. Tenant shall not license, lease or otherwise permit the use of the same by any other party.

[The remainder of this page is intentionally left blank.]

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed under seal as of the date first above written.

Landlord

1001 PAWTUCKET, L.L.C.

By: Winstanley Enterprises, Inc., its manager

By: /s/ Carter J. Winstanley
Name: Carter J. Winstanley
Title: Vice President

Tenant

RAPID MICRO BIOSYSTEMS, INC.

By: /s/ Stephen Delity
Name: Stephen Delity
Title: President and Chief Executive Officer

By: /s/ Michael J. Mullen
Name: Michael J. Mullen
Title: Chief Financial Officer and Secretary

Exhibit A-1

Premises

Exhibit A-2

Reserved Parking Spaces

Exhibit A-3

Current Rules and Regulations

Exhibit B

Base Building Systems Specification

Exhibit C

Tenant's Initial Construction

Exhibit C-1

Landlord's Work

Exhibit C-2

Office Areas

Exhibit D

Subordination, Non-Disturbance and Attornment Agreement Form

SCHEDULE A

DESCRIPTION OF PROPERTY

Exhibit E

Estoppel Certificate Form

Exhibit F

Permitted Hazardous Materials

FIRST AMENDMENT OF LEASE

This FIRST AMENDMENT OF LEASE ("Amendment") is entered into this 10th day of July, 2014 by and between **Farley White Pawtucket, LLC**, as successor in interest to 1001 Pawtucket, L.L.C., having a mailing address at c/o Farley White Management Company, 155 Federal Street, Suite 1800, Boston, MA 02110 (hereinafter called "Landlord") and **Rapid Micro Biosystems, Inc.**, having a mailing address at One Oak Park Drive, Bedford, MA 01730 (hereinafter called "Tenant")

Witnesseth:

A. Landlord and Tenant entered into a certain lease dated October 21, 2013 (the "Lease") consisting of approximately 39,252 rentable square feet located in Pod L2/A8 and Pod LG/A8 (the "Existing Premises"), all as more particularly described therein.

B. Tenant wishes to expand the Existing Premises by an additional 1,642 rentable square feet located in Pod L2/A6 (the "Expansion Premises"), as shown on Exhibit A attached hereto.

Landlord and Tenant desire to amend the Lease in the manner set forth below.

1. The Expansion Date shall be July 1, 2014. Following July 1, 2014, the Existing Premises and the Expansion Premises shall be referred to collectively as the "Premises" and shall total 40,894 rentable square feet.

2. Landlord shall arrange for and supervise the removal of VCT flooring within the Expansion Premises and the adjoining space currently holding electrical equipment which will be used for egress.

3. Tenant shall be responsible for reimbursing Landlord for the cost of removing the existing VCT flooring in the Expansion Premises, and any other improvements related to the removal thereof. Tenant's cost shall not exceed $12,500.00.

4. Within ninety (90) days of the completion of the removal of the VCT flooring, Tenant shall, at Tenant's sole expense, renovate the Expansion Premises in accordance with *Lease Section 3: Construction of Improvements* and Exhibit B attached hereto ("Expansion Improvements") and in accordance with all applicable state and municipal building codes and regulations.

5. On or prior to the expiration or early termination of the Term of the Lease, and in accordance with *Lease Section 3: Construction of Improvements* and *Lease Section 17: Tenant's Obligation to Quit*, Tenant shall be responsible for removing any Removal Items, as defined therein. Landlord and Tenant acknowledge the following Removal Items as identified to date. In no event does this provision limit Landlord's right to identify Removal Items in the future, either in connection with the Tenant Work or the Expansion Improvements.

Removal Items:

- All supplemental heating, ventilation or air conditioning equipment along with all associated wiring, cabling or conduit;
- Walk-in refrigerator/freezer unit to be installed in the Expansion Premises;
- Isolation pads used for equipment or trade fixtures.

6. Tenant shall be responsible for repairing any and all roof penetrations resulting from the installation of equipment on the Building's roof in accordance with *Lease Section 38: Rooftop Equipment*, even if said equipment is not specifically identified therein.

7. *With respect to the Expansion Premises only*, Tenant shall pay Basic Rent on the following schedule:

July 1, 2014 – July 31, 2015:	$8,210.00/annum; $684.17/month; $5.00/RSF
August 1, 2015 – July 31, 2016:	$8,620.50/annum; $718.38/month; $5.25/RSF
August 1, 2016 – July 31, 2017:	$9,031.00/annum; $752.58/month; $5.50/RSF
August 1, 2017 – July 31, 2018:	$9,441.50/annum; $786.79/month; $5.75/RSF
August 1, 2018 and thereafter:	$9,852.00/annum; $821.00/month; $6.00/RSF

8. Effective as of July 1, 2014, Tenant's Pro Rata Share shall be increased to 4.90%.

9. Landlord and Tenant each warrant and represent to the other that no broker, agent, commission salesman or other person has represented it in connection with the procurement or consummation of this Amendment.

Except as specifically amended by the terms of this First Amendment of Lease, all of the terms, conditions and provisions of the Lease shall remain in full force and effect throughout the balance of the Lease. From and after the date hereof, the Lease and this First Amendment of Lease shall collectively be referred to as the "Lease."

As of this date, the parties acknowledge that neither has a claim for damage or liability of any kind pursuant to the Lease, as amended, or at law or equity, and the parties hereby agree to release and hold each other harmless from and against all suits, liabilities, obligations or claims of any kind or any matters arising prior to this date.

WITNESS THE EXECUTION HEREOF, under seal, as of the date set forth above, in any number of counterpart copies, each of which counterpart copies shall be deemed an original for all purposes.

LANDLORD: **FARLEY WHITE PAWTUCKET, LLC**

/s/ John F. Power
By: John F. Power
Its: Manager

TENANT: **RAPID MICRO BIOSYSTEMS, INC.**

/s/ Michael J. Mullen
By: Michael J. Mullen
Its: Chief Financial Officer

EXHIBIT A

"Expansion Premises"

EXHIBIT B

EXPANSION IMPROVEMENTS

SECOND AMENDMENT OF LEASE

This SECOND AMENDMENT OF LEASE is entered into this 30th day of December, 2014 by and between **Farley White Pawtucket, LLC**, as successor in interest to 1001 Pawtucket, L.L.C., having a mailing address at c/o Farley White Management Company, 155 Federal Street, Suite 1800, Boston, MA 02110 (hereinafter called "Landlord") and **Rapid Micro Biosystems, Inc.**, having a mailing address at 1001 Pawtucket Boulevard West, Lowell, MA 01854 (hereinafter called "Tenant")

Witnesseth:

A. Landlord and Tenant entered into a certain lease dated October 21, 2013, as amended by a First Amendment of Lease dated July 10, 2014 (collectively, the "Lease") consisting of approximately 40,894 rentable square feet located in Pods L2/A8, L2/A6 and LG/A8 (the "Existing Premises"), all as more particularly described therein.

B. Tenant wishes to expand the Existing Premises by an additional 8,927 rentable square feet in Pod L2/A4 (the "Storage Expansion Space"), as shown on Exhibit A attached hereto.

C. Landlord and Tenant desire to amend the Lease in the manner set forth below.

1. The Storage Expansion Date shall be the later of December 15, 2014 and the date that Tenant delivers a signed Second Amendment of Lease to Landlord. Effective as of the Storage Expansion Date, the Premises shall total 49,821 rentable square feet.

2. Tenant accepts the Storage Expansion Space in its "as-is" condition. The Permitted Uses of the Storage Expansion Space shall include storage, warehousing and related ancillary uses. No personnel should occupy or conduct business in the Storage Expansion Space.

3. Commencing on the Storage Expansion Date and *with respect to the Storage Expansion Space only*, Tenant shall pay Basic Rent on the following schedule:

Through December 31, 2015:	$31,244.50/annum; $2,603.71/month; $3.50/sf
January 1, 2016 – December 31, 2016:	$32,806.73/annum; $2,733.89/month; $3.68/sf
January 1, 2017 – December 31, 2017:	$34,447.06/annum; $2,870.59/month; $3.86/sf
January 1, 2018 – December 31, 2018:	$36,169.41/annum; $3,014.12/month; $4.05/sf
January 1, 2019 and thereafter:	$37,977.89/annum; $3,164.82/month; $4.25/sf

4. Effective as of the Storage Expansion Date, Tenant's Pro Rata Share shall be increased to 5.96%.

5. Electricity consumption in Pod L2/A4 is measured by a series of checkmeters. Tenant shall pay to Landlord, upon demand and as Additional Rent, the cost of Tenant's electricity consumption in the Storage Expansion Space. Tenant's electricity consumption shall be estimated by multiplying the total cost of electricity as measured by the Pod L2/A4 checkmeters times 26.7% (Tenant's pro rata share of Pod L2/A4).

6. At any time during the Term of the Lease, Landlord shall have the option, exercisable by no less than sixty (60) days written notice to Tenant, to terminate this Lease with respect to the Storage Expansion Space only, said early termination date to be identified in the notice provided (the "Recapture Date"). On or before the Recapture Date, Tenant shall yield-up the Storage Expansion Space in accordance with the first paragraph of *Lease Section 17*, failing which the provisions of the second paragraph of *Lease Section 17* shall apply to the Storage Expansion Space.

7. Landlord and Tenant each warrant and represent to the other that no broker, agent, commission salesman or other person has represented it in connection with the procurement or consummation of this Second Amendment of Lease.

Except as specifically amended by the terms of this Second Amendment of Lease, all of the terms, conditions and provisions of the Lease shall remain in full force and effect throughout the balance of the Lease. From and after the date hereof, the Lease and this Second Amendment of Lease shall collectively be referred to as the "Lease."

As of this date, the parties acknowledge that neither has a claim for damage or liability of any kind pursuant to the Lease, as amended, or at law or equity, and the parties hereby agree to release and hold each other harmless from and against all suits, liabilities, obligations or claims of any kind or any matters arising prior to this date.

WITNESS THE EXECUTION HEREOF, under seal, as of the date set forth above, in any number of counterpart copies, each of which counterpart copies shall be deemed an original for all purposes.

LANDLORD: **FARLEY WHITE PAWTUCKET, LLC**

/s/ Roger W. Altreuter
By: Roger W. Altreuter
Its: Manager

TENANT: **RAPID MICRO BIOSYSTEMS, INC.**

/s/ Robert Sargresi
By: Robert Sargresi
Its: CEO

THIRD AMENDMENT OF LEASE

This THIRD AMENDMENT OF LEASE ("Third Amendment") is entered into this 9th day of January 2015 by and between **Farley White Pawtucket, LLC**, as successor in interest to 1001 Pawtucket, L.L.C., having a mailing address at c/o Farley White Management Company, 155 Federal Street, Suite 1800, Boston, MA 02110 (hereinafter called "Landlord") and **Rapid Micro Biosystems, Inc.**, having a mailing address at 1001 Pawtucket Boulevard, Lowell, MA 01854 (hereinafter called "Tenant")

Witnesseth:

A. Landlord and Tenant entered into a certain lease dated October 21, 2013, as amended by a First Amendment of Lease dated July 10, 2014 and a Second Amendment of Lease dated December 30, 2014 (collectively, the "Lease") consisting of approximately 49,821 rentable square feet in Pods L2/A8, L2/A6 and L2/A4 (the "Premises"), all as more particularly described therein.

B. Tenant has requested a disbursement from Landlord totaling $379,670.00 in connection with Tenant's Work ("TI Allowance Increase"), which is the maximum allowable advance per *Lease Section 1: Basic Lease Terms and Certain Defined Terms: Special Conditions.*

B. Landlord and Tenant desire to amend the Lease in the manner set forth below.

1. Commencing January 1, 2015 and continuing through the expiration of the Initial Term, Tenant shall make payments of additional Basic Rent to Landlord totaling $8,449.95 per month, which represents the amortization of said TI Allowance Increase.

Except as specifically amended by the terms of this Third Amendment of Lease, all of the terms, conditions and provisions of the Lease shall remain in full force and effect throughout the balance of the Term of the Lease. From and after the date hereof, the Lease and this Third Amendment of Lease shall collectively be referred to as the "Lease."

As of this date, the parties acknowledge that neither has a claim for damage or liability of any kind pursuant to this Lease, as amended, or at law or equity, and the parties hereby release and hold each other harmless from and against all suits, liabilities, obligations or claims of any kind or any matters arising prior to this date.

(Signatures on following page)

WITNESS THE EXECUTION HEREOF, under seal, as of the date first set forth above, in any number of counterpart copies, each of which counterpart copies shall be deemed an original for all purposes.

LANDLORD: **FARLEY WHITE PAWTUCKET, LLC**

/s/ Roger W. Altreuter
By: Roger W. Altreuter
Its: Manager

TENANT: **RAPID MICRO BIOSYSTEMS, INC.**

/s/ Robert Spignesi
By: Robert Spignesi
Its: CEO

FOURTH AMENDMENT OF LEASE

This FOURTH AMENDMENT OF LEASE ("Fourth Amendment") is entered into this 18th day of June, 2015 by and between **Farley White Pawtucket, LLC**, as successor in interest to 1001 Pawtucket, L.L.C., having a mailing address at c/o Farley White Management Company, 155 Federal Street, Suite 1800, Boston, MA 02110 (hereinafter called "Landlord") and **Rapid Micro Biosystems, Inc.**, having a mailing address at 1001 Pawtucket Boulevard, Lowell, MA 01854 (hereinafter called "Tenant")

Witnesseth:

A. Landlord and Tenant entered into a certain lease dated October 21, 2013, as amended by a First Amendment of Lease dated July 10, 2014, a Second Amendment of Lease dated December 30, 2014 and a Third Amendment of Lease dated January 9, 2015 (collectively, the "Lease") consisting of approximately 49,821 rentable square feet in Pods L2/A8, L2/A6, L2/A4 and LG/A8 (the "Existing Premises"), all as more particularly described therein.

B. Tenant wishes to relocate the existing Storage Expansion Space from Pod L2/A4 to approximately 8,927 rentable square feet located in Pod L2/A7, as shown on Exhibit A attached hereto (the "Pod L2/A7 Storage").

C. Landlord and Tenant desire to amend the Lease in the manner set forth below.

1. The Relocation Date shall be the later of May 22, 2015 and the date the Tenant delivers a signed Fourth Amendment of Lease to Landlord. Effective as of the Relocation Date, the Storage Expansion Space shall be relocated to the Pod L2/A7 Storage.

2. Within fourteen (14) days of the Relocation Date, Tenant shall yield-up the Storage Expansion Space in accordance with the first paragraph of *Lease Section 17*, failing which the provisions of the second paragraph of *Lease Section 17* shall apply to the Storage Expansion Space.

3. Tenant accepts the Pod L2/A7 Storage in its "as-is" condition. The Permitted Uses remain unchanged.

4. Tenant's Basic Rent schedule and Tenant's Pro Rata Share remain unchanged and are as previously set forth in the Lease.

5. Electricity consumption in Pod L2/A7 is measured by a series of checkmeters. Tenant shall pay to Landlord, upon demand and as Additional Rent, the cost of Tenant's electricity consumption in the Pod L2/A7 Storage.

6. At any time during the Term of the Lease, Landlord shall have the option, exercisable by no less than sixty (60) days written notice to Tenant, to terminate this Lease with respect to the Pod *1S2/A.1* Storage only, said termination date to be identified in the noticed provided (the "Recapture Date"). On or before the Recapture Date, Tenant shall yield-up the Pod L2/A7 Storage in accordance with the first paragraph of *Lease Section 17*, failing which the provisions of the second paragraph of *Lease Section 17* shall apply to the Pod L2/A7 Storage.

7. Landlord and Tenant each warrant and represent to the other that no broker, agent, commission salesman or other person has represented it in connection with the procurement or consummation of this Fourth Amendment of Lease.

Except as specifically amended by the terms of this Fourth Amendment of Lease, all of the terms, conditions and provisions of the Lease shall remain in full force and effect throughout the balance of the Term of the Lease, From and after the date hereof, the Lease and this Fourth Amendment of Lease shall collectively be referred to as the "Lease."

As of this date, the parties acknowledge that neither has a claim for damage or liability of any kind pursuant to this Lease, as amended, or at law or equity, and the parties hereby release and hold each other harmless from and against all suits, liabilities, obligations or claims of any kind or any matters arising prior to this date.

WITNESS THE EXECUTION HEREOF, under seal, as of the date first set forth above, in any number of counterpart copies, each of which counterpart copies shall be deemed an original for all purposes.

LANDLORD: **FARLEY WHITE PAWTUCKET, LLC**

/s/ John F. Power
By: John F. Power
Its: Manager

TENANT: **RAPID MICRO BIOSYSTEMS, INC.**

/s/ Steve Furlong
By: Steve Furlong
Its: CFO

EXHIBIT A

"Pod L2/A7 Storage"

FIFTH AMENDMENT OF LEASE

This FIFTH AMENDMENT OF LEASE ("Fifth Amendment") is entered into this 11th day of March, 2016 by and between **Farley White Pawtucket, LLC**, as successor in interest to 1001 Pawtucket, L.L.C., having a mailing address at c/o Farley White Management Company, 155 Federal Street, Suite 1800, Boston, MA 02110 (hereinafter called "Landlord") and **Rapid Micro Biosystems, Inc.**, having a mailing address at 1001 Pawtucket Boulevard, Lowell, MA 01854 (hereinafter called "Tenant")

Witnesseth:

A. Landlord and Tenant entered into a certain lease dated October 21, 2013, as amended by a First Amendment of Lease dated July 10, 2014, a Second Amendment of Lease dated December 30, 2014, a Third Amendment of Lease dated January 9, 2015 and a Fourth Amendment of Lease dated June 18, 2015 (collectively, the "Lease") consisting of approximately 49,821 rentable square feet in Pods L2/A8, L2/A6, L2/A4 and LG/A8 (the "Existing Premises"), all as more particularly described therein.

B. Landlord and Tenant wish to reconfigure the existing Pod L2/A7 Storage as shown in Exhibit A attached hereto.

C. Landlord and Tenant desire to amend the Lease in the manner set forth below.

1. As of the date hereof, Pod L2/A7 Storage Space has been reconfigured. All other terms and conditions of the Lease shall remain unchanged.

Except as specifically amended by the terms of this Fifth Amendment of Lease, all of the terms, conditions and provisions of the Lease shall remain in full force and effect throughout the balance of the Term of the Lease. From and after the date hereof, the Lease and this Fifth Amendment of Lease shall collectively be referred to as the "Lease."

As of this date, the parties acknowledge that neither has a claim for damage or liability of any kind pursuant to this Lease, as amended, or at law or equity, and the parties hereby release and hold each other harmless from and against all suits, liabilities, obligations or claims of any kind or any matters arising prior to this date.

(Signatures on the page to follow)

WITNESS THE EXECUTION HEREOF, under seal, as of the date first set forth above, in any number of counterpart copies, each of which counterpart copies shall be deemed an original for all purposes.

LANDLORD: **FARLEY WHITE PAWTUCKET, LLC**

/s/ John F. Power

By: John F. Power
Its: Manager

TENANT: **RAPID MICRO BIOSYSTEMS, INC.**

/s/ Steve Furlong

By: Steve Furlong
Its: CFO

EXHIBIT A

“Pod L2/A7 Stoage”

SIXTH AMENDMENT OF LEASE

This SIXTH AMENDMENT OF LEASE ("Sixth Amendment") is entered into this 29th day of August, 2018 by and between **Farley White Pawtucket, LLC**, as successor in interest to 1001 Pawtucket, L.L.C. ("1001 Pawtucket"), having a mailing address at c/o Farley White Management Company, 155 Federal Street, Suite 1800, Boston, MA 02110 (hereinafter called "Landlord") and **Rapid Micro Biosystems, Inc**., having a mailing address at 1001 Pawtucket Boulevard, Lowell, MA 01854 (hereinafter called "Tenant").

Witnesseth:

A. 1001 Pawtucket and Tenant entered into a certain lease dated October 21, 2013, as amended by (i) a First Amendment of Lease dated July 10, 2014, (ii) a Second Amendment of Lease dated December 30, 2014, (iii) a Third Amendment of Lease dated January 9, 2015, (iv) a Fourth Amendment of Lease dated June 18, 2015, and (v) a Fifth Amendment of Lease dated March 11, 2016 (collectively, the "Lease"), pursuant to which Tenant leased certain space at 1001 Pawtucket Boulevard, Lowell, MA 01854, consisting of approximately 49,821 rentable square feet in Pods L2/A6, L2/A7, L2/A8 and LG/A8 (the "Existing Premises"), all as more particularly described therein.

B. Tenant wishes to expand the Existing Premises by an additional 3,708 rentable square feet in POD L2/A7 (the "L2/A7 Expansion Space"). Simultaneously, Tenant wishes to give back 727 rentable square feet of storage space in Pod LG/A8 (the "LG/A8 Giveback Space"). The L2/A7 Expansion Space and the LG/A8 Giveback Space are shown as the hatched areas on Exhibits A and A-l attached hereto, respectively.

C. Landlord and Tenant desire to amend the Lease in the manner set forth below.

1. The Sixth Amendment Expansion Date shall be the earlier of August 1, 2019 and the date Tenant submits the first written requisition for all or a portion of the 2018 TI Allowance. From and after the Sixth Amendment Expansion Date, (i) Tenant shall have the exclusive possession of the L2/A7 Expansion Space, (ii) the Premises shall consist of 52,802 rentable square feet in Pods L2/A6, L2/A7 and L2/A8, and (iii) Tenant's Pro Rata Share shall adjust to 6.32%.

2. Within ten (10) days after the date of this Sixth Amendment, Tenant shall yield up the LG/A8 Giveback Space in accordance with the first paragraph of *Lease Section 17*, failing which the provisions of the second paragraph of *Lease Section 17* shall apply to the LG/A8 Giveback Space. The date on which Tenant yields possession of the LG/A8 Giveback Space to Landlord is referred to as the "Giveback Date."

3. The Term of the Lease is hereby extended to, and shall expire on, July 31, 2026 (subject in all events to Tenant's right to further extend the Term pursuant to Section 4 of the Lease).

4. Effective as of the Sixth Amendment Expansion Date, *and with respect to the L2/A7 Expansion Space only*, Tenant shall pay Basic Rent on the following schedule:

Through July 31, 2020:	$29,664.00/annum; $2,472.00/month; $8.00/RSF
August 1, 2020 - July 31, 2021:	$30,591.00/annum; $2,549.25/month; $8.25/RSF;
August 1, 2021- July 31, 2022:	$31,518.00/annum; $2,626.50/month; $8.50/RSF;
August 1, 2022 - July 31, 2023:	$32,445.00/annum; $2,703.75/month; $8.75/RSF;
August 1, 2023 - July 31, 2024:	$33,372.00/annum; $2,781.00/month; $9.00/RSF;
August 1, 2024 - July 31, 2025:	$34,299.00/annum; $2,858.25/month; $9.25/RSF;
August 1, 2025 and thereafter:	$35,226.00/annum; $2,935.50/month; $9.50/RSF.

Effective from and after the Giveback Date, *and with respect to the Existing Premises less the LG/A8 Giveback Space*, Tenant shall pay Basic Rent on the following schedule:

Giveback Date - July 31, 2020:	$392,752.00/annum; $32,729.33/month; $8.00/RSF;
August 1, 2020 - July 31, 2021:	$405,025.50/annum; $33,752.13/month; $8.25/RSF;
August 1, 2021 - July 31, 2022:	$417,299.00/annum; $34,774.92/month; $8.50/RSF;
August 1, 2022 - July 31, 2023:	$429,572.50/annum; $35,797.71/month; $8.75/RSF;
August 1, 2023 - July 31, 2024:	$441,846.00/annum; $36,820.50/month; $9.00/RSF;
August 1, 2024 - July 31, 2025:	$454,119.50/annum; $37,843.29/month; $9.25/RSF;
August 1, 2025 and thereafter:	$466,393.00/annum; $38,866.08/month; $9.50/RSF

5. Electricity. Electricity consumption in Pod L2/A7 is measured by a series of checkmeters. Tenant shall pay for electricity consumed in the L2/A7 Expansion Space in accordance with *Lease Section 8: Electricity; Telecommunications and Other Utilities.*

6. TI Allowance Increase. Effective July 31, 2019, so long as all payments are made, Tenant's TI Allowance Increase (as defined in the Third Amendment to Lease) shall be amortized in full and Tenant shall have no further obligations with respect to said TI Allowance Increase.

7. Improvements. Any and all improvements to the Premises shall be made in accordance with *Lease Section 3: Construction of Improvements* and in accordance with all applicable state and municipal building codes, except that Landlord shall have the right to charge a one-time supervisory fee of $2,500.00 to be paid by Tenant to Landlord as Additional Rent. Subject to Landlord's right of approval (which shall not be unreasonably withheld, delayed or conditioned), Tenant may select and engage its own preferred contractors, subcontractors, architects, engineers and consultants to perform such work.

   Landlord shall provide to Tenant an allowance of up to $739,228.00 toward the hard and soft costs associated with said improvements (the "2018 TI Allowance"). The 2018 TI Allowance may be used for the costs of design, preparation, renovation and construction of the Premises, and may also be applied to non-Building related costs including without limitation permitting, space plans, moving, architectural and engineering, wiring and cabling, special electrical power distribution, telephone and security systems. Any time prior to the second (2^{nd}) anniversary of the execution date hereof, Tenant shall have the on-going right to request the 2018 TI Allowance, or a portion thereof, by written notice to Landlord to be accompanied by all invoices, lien waivers and/or municipal certificates, when applicable, to substantiate the work completed. Provided Tenant meets the conditions herein, Landlord shall reimburse Tenant for the amount requested, not to exceed the full amount of the 2018 TI Allowance, within thirty (30) days of Landlord's receipt of written notice and documentation as aforesaid. Any unused portions of the 2018 TI Allowance not requested beyond the second (2^{nd}) anniversary of the execution date hereof shall be forfeited.

8. External Storage. During the Term of the Lease, Tenant shall have permission to have access to and use a portion of the exterior portion of the Property and enjoy 24-hour access thereto to use, maintain and replace materials and equipment, as hereinafter defined, at a location to be mutually agreed upon by Landlord and Tenant (the, "External Storage Area"). The External Storage Area is to be used by Tenant solely for the installation, operation, maintenance, repair and replacement during the Term of this Lease of a liquid nitrogen tank, oxygen tank, and generator (collectively, the "Exterior Equipment"). The Exterior Equipment shall also include one conduit as necessary to connect any such equipment to the Premises subject to Landlord's prior written approval not to be unreasonably withheld, conditioned or delayed, to be located in a vertical chase mutually designated by Landlord and Tenant. Tenant's installation and operation of the Exterior Equipment and its obligations with respect thereto shall be all in accordance with the terms, provisions, conditions and agreements contained in this Lease (including, without limitation, provisions regarding compliance with applicable law set forth in *Lease Section 3* and *Lease Section 11* thereof), shall be without interference with the business and telecommunications of other tenants or any other person, and Tenant shall be responsible for installing, maintaining and implementing all related safety measures and devices reasonably required in connection with the installation, operation or use of the Exterior Equipment, and (subject to applicable waivers of claims and rights of subrogation set forth in the Lease, and except for matters arising from the negligence or willful misconduct of Landlord or its agents, employees or contractors) shall be solely responsible for all damage to persons or property resulting from the installation, operation or use of the Exterior Equipment in each case indemnifying and holding harmless Landlord in the manner elsewhere provided in this Lease. Without limiting the generality of the foregoing, (x) Tenant's installation, operation and use of the Exterior Equipment shall not interfere with the Building Systems or with other tenants in the Building and (y) Tenant shall be solely responsible, at Tenant's cost, for the repair, maintenance and, if applicable, landscaping of the External Storage Area and for the payment of any personal property taxes attributable to the Exterior Equipment.

   Tenant shall install the Exterior Equipment in the External Storage Area at its sole cost and expense, at such times and in such manner as Landlord may reasonably designate and in accordance with all of the applicable provisions of this Lease. Landlord shall not be obligated to perform any work or incur any expense to prepare the External Storage Area for Tenant's use thereof.

   Prior to commencing installation of the Exterior Equipment, Tenant shall provide Landlord with (i) copies of all required permits, licenses and authorizations which Tenant will obtain at its own expense and which Tenant will maintain at all times during the operation of the Exterior Equipment; and (ii) a certificate of insurance evidencing insurance coverage as required by this Lease and any other insurance reasonably required by Landlord for the installation and operation of the Exterior Equipment.

   Tenant shall pay to Landlord as Additional Rent all applicable taxes or governmental charges, fees, or impositions upon Landlord and arising solely out of Tenant's use of the External Storage Area, and the amount, if any, by which Landlord's insurance premiums increase as a result of the installation of the Exterior Equipment.

At the expiration or earlier termination of the Lease or the permanent termination of the operation of any portion of the Exterior Equipment by Tenant, Tenant shall, at its sole cost and expense, (i) remove the Exterior Equipment (or the applicable portion thereof) from the External Storage Area and the Building in accordance with the terms of *Lease Section 3*, (ii) repair and restore such External Storage Area, including (if applicable) the roof and roof membrane, to Landlord's reasonable satisfaction and leave the External Storage Area in good order and repair, reasonable wear and tear excepted and (iii) pay all amounts due and owing with respect to this Section up to the date of the termination thereof. If Tenant does not remove the Exterior Equipment when so required, the Exterior Equipment shall become Landlord's property and, at Landlord's election, Landlord may remove and dispose of the Exterior Equipment and charge Tenant for all costs and expenses incurred as Additional Rent. Notwithstanding that Tenant's use of the External Storage Area shall be subject at all times to and shall be in accordance with the terms, covenants, conditions and agreements contained in this Lease, the External Storage Area shall not be deemed part of the Premises. All Tenant obligations under this Section shall survive the expiration or earlier termination of the Term of this Lease.

Landlord may not unreasonably withhold, delay or condition any consent of Landlord applicable under this Section unless the matter that is the subject of such consent would, in Landlord's reasonable determination, (i) adversely affect building systems, including but not limited to fire-safety, telecommunications, curtain wall, electrical, heating, ventilation, plumbing or other mechanical systems, (ii) adversely affect any structural elements of the Building, the curtain wall or any exterior signage, (iii) adversely affect any other tenant of the Building, or (iv) void or impair any warranty applicable to the roof of the Building.

9. Back-Up Generator. During the Term, Landlord grants to Tenant permission, without additional charge (except that Tenant will be responsible for the costs of actual connection), to connect to the Building's back-up generator in order to provide a source of emergency power for Tenant's cold storage unit ("Tenant's Equipment"). Tenant's Equipment shall draw a maximum of 100 amps of service. Tenant shall be responsible for the connection between Tenant's Equipment and the back-up generator and shall not make any such connection without the prior review and approval of Landlord. Landlord shall be responsible for general maintenance of the back-up generator. Subject to the provisions of Section 13 of the Lease, Tenant will indemnify and hold Landlord harmless from any loss, cost, damage or expense suffered by Landlord as a result of Tenant's use of the Building's back-up generator.

10. Pod L2/A7. As of the Sixth Amendment Date, Landlord's right to recapture Pod L2/A7 Storage per paragraph 6 of the Fourth Amendment is hereby null and void. In addition, should adjacent space in L2/A7, as identified by the hatched area on Exhibit B attached hereto, become available for lease during the Term, Landlord shall provide written notice thereof to Tenant ("Notice of Availability"). Said adjacent space shall be "available for lease" when such space will become available because the current tenant's lease has or will expire without a renewal or extension thereof. Landlord shall only be required to provide said Notice of Availability and is not required to reserve said space for Tenant in any way.

11. Cafeteria. Landlord currently provides food service to the tenants and occupants of the Building from 6:30 am to 2:00 pm Monday through Friday. Landlord has agreed to expand the Building's food service to accommodate employees working outside of the existing food service hours. This may be accomplished by extending the cafeteria's operating hours or by the implementation of a grab-n-go solution. Landlord shall use commercially reasonable efforts to implement a mutually agreeable food service solution on or before December 31, 2018.

12. Termination Option. Tenant shall have a one-time right to terminate the Lease (the "Termination Option") on July 31,2024 (the "Termination Date"), by giving written notice thereof to Landlord no later than July 31, 2023, provided that at the time of giving such notice there exists no default by Tenant (continuing uncured beyond the expiration of all applicable notice and grace periods). As a further condition to any such early termination, on or before the Termination Date, Tenant shall make a payment to Landlord along with delivery of said termination notice, of a "termination fee" in the amount of the sum of all unamortized transaction costs (including the 2018 TI Allowance, brokerage commissions and legal fees) paid by Landlord in connection with this Sixth Amendment calculated on a level payments basis with interest at 6% per annum plus two months' Basic Rent at the rate in place at the time of the Termination Date.

13. Consent of Lender. As a condition to this Sixth Amendment, Landlord will, within ten (10) business days after the date hereof and at Landlord's cost, obtain and deliver to Tenant the consent of Landlord's mortgage lender to this Sixth Amendment.

14. Brokerage. Tenant and Landlord each warrants and represents that it has dealt with no broker other than Cushman & Wakefield and Farley White Management Company (collectively, the "Brokers") in connection with this transaction and each agrees to defend, indemnify and save the other harmless from and against any and all claims for a commission arising out of this Sixth Amendment made by anyone other than the Brokers (as defined herein) claiming to have had dealings with the indemnifying party. The brokerage commission of the Brokers will be paid by Landlord in accordance with the terms of a separate agreement.

15. Counterparts. This Amendment may be executed in multiple counterparts, each of which shall constitute an original. Any executed copy of this Amendment delivered by confirmed facsimile or electronic mail shall be deemed to be binding to the same extent as an original executed copy of this Amendment. If so executed and delivered by one or both of the parties via facsimile or electronic mail, each party agrees to deliver to the other party, a complete original, manually signed copy of this Amendment upon request.

16. No Default; Approvals. Landlord hereby represents that Tenant is not in default to the best of Landlord's knowledge of its obligations or covenants under the Lease as of the date hereof. By executing and delivering this Amendment, each of the parties represents and warrants to the other that such party has obtained any and all third party consents and/or approvals necessary for such party to enter into this Sixth Amendment.

17. Ratification. In all respects, the Lease as hereby amended and modified, is hereby ratified, confirmed and approved.

Except as specifically amended by the terms of this Sixth Amendment, all of the terms, conditions and provisions of the Lease shall remain in full force and effect throughout the Term of the Lease. From and after the date hereof, the Lease and this Sixth Amendment shall collectively be referred to as the "Lease."

As of this date the parties acknowledge that neither has actual knowledge of a claim for damage or liability of any kind pursuant to this Lease, as amended, or at law or in equity.

WITNESS THE EXECUTION HEREOF, under seal, as of the date set forth above, in any number of counterpart copies, each of which counterpart copies shall be deemed an original for all purposes.

LANDLORD: **FARLEY WHITE PAWTUCKET, LLC**

/s/ Rodger W. Altrevter

By: Rodger W. Altrevter
Its: Manager

TENANT: **RAPID MIRCO BIOSYSTEMS, INC.**

/s/ Richard S. Kollender

By: Richard S. Kollender
Its: CBO + CFO

EXHIBIT A

"L2/A7 Expansion Space"

EXHIBIT A-1

“LG/A8 Giveback Space”

Exhibit 10.8

SUBLEASE

Effective as of June 8, 2021 (the "Effective Date"), NATIONAL MEDICAL CARE, INC., a Delaware corporation, ("Sublandlord"), and RAPID MICRO BIOSYSTEMS, INC., a Delaware corporation ("Subtenant"), hereby agree as follows:

1. Overlease. As used herein, the term "Overlease" shall mean that certain Lease, dated as of June 21, 2019, by and between DUFFY HARTWELL LLC., a Massachusetts limited liability company, as Landlord thereunder ("Overlandlord"), and Sublandlord, as Tenant thereunder, pursuant to which Sublandlord leases certain real property consisting of approximately 33,339 rentable square feet at 25 Hartwell Avenue, Lexington, Massachusetts shown on Exhibit D (the "Premises"). A true, correct and complete copy of the Overlease is attached as Exhibit F. Capitalized terms not defined herein shall have the meaning ascribed to them in the Overlease.

2. Sublease. Sublandlord hereby subleases to Subtenant the entire Premises, subject to the terms and conditions hereof. This Sublease is a sublease under the Overlease and is subject to all of the terms and provisions thereof; provided, however, that if any provisions of this Sublease conflict with the provisions of the Overlease, the provisions of this Sublease shall govern. This Sublease shall be deemed to contain all of the same covenants, agreements, conditions, terms and provisions as contained in the Overlease, mutatis mutandis (the necessary changes being made to reflect the fact that Sublandlord is the Landlord and Subtenant is the Tenant) except to the extent otherwise provided herein and except that the following provisions of the Overlease shall not apply hereto:

- Section 1.2 (To the extent inconsistent herewith).
- Section 2.2.1 (Second sentence only).
- Section 2.3.
- Section 2.4.
- Section 3.2.
- Sections 6.1 and 6.2.
- Section 9.2.5.
- Section 13.5.
- Section 13.24.
- Section 13.39.
- Section 13.40.
- Exhibit A-1.
- Exhibit A-2.

- Exhibit C.

- Exhibit E.

3. Obligations of Parties. From and after the Commencement Date, Subtenant hereby agrees to perform all of the obligations applicable to the Premises imposed on Sublandlord as Tenant under the Overlease, subject to Sections 5 and 6 hereof, and except as expressly provided for herein. From and after the Commencement Date, Sublandlord shall have no obligations or liabilities under this Sublease except as provided in the following sentence and in the following Sections of this Sublease. Sublandlord hereby agrees:

(a) to timely pay all rent and other charges due to the Overlandlord under the Overlease;

(b) to use due diligence and reasonable efforts to cause the Overlandlord to perform the obligations imposed upon the Overlandlord under the Overlease which are applicable to this Sublease to Subtenant's reasonable satisfaction. If any breach or default of Overlandlord under the Overlease has not been resolved after the expiration of thirty (30) days after notice, then provided that Subtenant is not in default under this Sublease, upon the request of Subtenant Sublandlord, at Subtenant's expense, shall take such action, including legal action, as Sublandlord shall reasonably determine upon to enforce Overlandlord's obligations The foregoing notwithstanding, if any breach of the Overlease shall entitle Sublandlord to assert claims for an abatement of rent for constructive eviction or otherwise, then such abatement shall accrue in favor of Subtenant provided that there shall be no abatement of rent hereunder except to the extent Sublandlord shall receive a corresponding abatement under the Overlease. If Sublandlord shall be entitled to an abatement rent or other claims arising from fire or other casualty, then Subtenant shall have the same claims;

(c) not to (i) surrender or terminate the Overlease prior to its scheduled expiration date without the consent of Subtenant as long as this Sublease is in effect, or (ii) amend or modify the Overlease, the result of which would materially and adversely affect Subtenant's rights or obligations under this Sublease or the Premises;

(d) to comply with all the terms and provisions of the Overlease, except to the extent Subtenant has assumed the same;

(e) to, promptly following receipt thereof, deliver to Subtenant a copy of any and all notices received by Sublandlord from Master Landlord which would have any material effect upon the Premises or this Sublease; and

(f) to pay Overlandlord any administrative fees or other expenses required to be paid to, or for Overlandlord in connection with the submission of this Sublease for Overlandlord's consent.

This Sublease is subject and subordinate to the Overlease and shall terminate upon the expiration or earlier termination of the Overlease.

The liability insurance maintained by Subtenant pursuant to Section 9.2.1 of the Overlease shall name Sublandlord, Overlandlord and any other parties required by such Section as additional insureds.

For the purpose of Section 13.22 of the Overlease (Non-Subrogation), references to "Landlord", "Tenant", "each party" and the like shall be deemed to mean Overlandlord, Sublandlord and Subtenant, or each of them, as appropriate.

4. Term; Delivery of Premises. The term of this Sublease ("Sublease Term") shall begin on August 1, 2021 (the "Commencement Date") and shall expire on June 30, 2029; provided that in no event shall such Commencement Date occur unless and until the Overlandlord's Consent has been obtained. The Premises shall be delivered in its current as-is condition and in otherwise good working order and condition including, but not limited to all HVAC and other mechanical systems, lighting, fans, plumbing, electrical fixtures and restrooms. After receipt of Overlandlord's Consent, Subtenant may, at no charge to Subtenant, provided Subtenant shall have first provided a certificate of the insurance required of it hereunder, enter the Premises for the purpose of preparing the same for its occupancy from and after the Effective Date, including performing its tenant improvements and installing necessary furniture, fixtures and equipment. Notwithstanding anything in this sublease or the Overlease to the contrary, in no event shall Subtenant have any obligation to replace the HVAC unit(s) existing in the Premises as it is Overlandlord's obligation to make all necessary repairs and replacements thereto. Subtenant shall pay for any such repairs or replacements charged to the Sublandlord according to the Overlease.

5. Fixed Rent. Beginning four (4) months after the Commencement Date (the "Rent Commencement Date"), Subtenant shall pay to Sublandlord Fixed Rent as set forth in Exhibit A hereto (in lieu of the Fixed Rent set forth in the Overlease), payable in advance on or before the first of each month.

6. Additional Rent. Beginning on the Commencement Date, Subtenant shall pay the Additional Rent for Taxes and Operating Expenses in accordance with, and subject to Article 8 of the Overlease. Subtenant shall be entitled to receive any reduction or refund of any Taxes allocable to the Sublease Term obtained by Landlord and received by Tenant pursuant to Section 8.1.8 of the Overlease.

7. Security Deposit[1]. As security for Subtenant's faithful performance of its obligations hereunder, Subtenant shall deliver to Sublandlord, upon the execution of this Sublease by Subtenant, a clean, irrevocable letter of credit in the face amount of $184,000, issued to Sublandlord as the sole beneficiary, substantially in the form of Exhibit C hereto (the "Letter of Credit"). The Letter of Credit shall have a stated duration of and shall be effective for at least one (1) year with provision for automatic successive annual one-year extensions during the Term and for sixty (60) days thereafter. Subtenant shall keep the Letter of Credit in force throughout the Term and for sixty (60) days after the expiration date or the earlier termination of the Term. Subtenant shall deliver to Sublandlord a renewal Letter of Credit no later than thirty (30) days prior to the expiration date of any Letter of Credit issued under this Section 7, and, if Subtenant fails to do so, Sublandlord may draw the entire amount of the expiring Letter of Credit and hold the proceeds in cash as the Security Deposit, as hereinafter provided, but in that event, Subtenant shall, upon demand, provide Sublandlord with a new Letter of Credit, meeting the requirements of this Sublease as a security deposit, in lieu of such cash, and upon receipt of such replacement Letter of Credit, Sublandlord shall promptly return such cash security deposit to Subtenant. The Letter of Credit shall be issued by a commercial bank reasonably satisfactory to and approved by Sublandlord.

[1] Under review by issuing bank.

If Subtenant fails to pay Fixed Rent or other charges due hereunder, or otherwise defaults with respect to any provision of this Sublease beyond any applicable notice and cure periods, Sublandlord may (but shall have no obligation to) use all or any portion of the Letter of Credit for the payment of any monthly installment of Fixed Rent or other charge due hereunder, to pay any other sum to which Sublandlord may become obligated by reason of Subtenant's default, or to compensate Sublandlord for any loss or damage which Sublandlord may suffer thereby. If Sublandlord so uses or applies all or any portion of the Letter of Credit, Subtenant shall within ten (10) business days after written demand therefor, restore the Letter of Credit to the initial face amount thereof. Provided Subtenant is not otherwise in default under the terms of this Sublease, beyond any applicable notice and cure periods, the Letter of Credit, or so much thereof as shall not then have been applied by Sublandlord, shall be returned without payment of interest or other amount for its use, to Subtenant (or, at Sublandlord's option, to the last assignee, if any, of Subtenant's interest hereunder) within thirty (30) days after the expiration of the Sublease Term, and after Subtenant has vacated and surrendered the Premises as required hereunder. No trust relationship is created herein between Sublandlord and Subtenant with respect to the Letter of Credit. Subtenant acknowledges that the Letter of Credit is not an advance payment of any kind or a measure of or limit on Sublandlord's damages in the event of Subtenant's default. Any application of the Letter of Credit by Sublandlord shall be without prejudice to any other right or remedy provided under this Sublease or pursuant to applicable law. The holder of a mortgage shall not be responsible to Subtenant for the return or application of any the Letter of Credit, whether or not it succeeds to the position of Sublandlord hereunder, unless the Letter of Credit shall have been received in hand by such holder.

8. Improvements. Except to the extent permitted under the Overlease without the consent of Overlandlord, Subtenant shall obtain the consent of Overlandlord to any improvements or alterations Subtenant shall desire to make in the Premises. If the consent of Overlandlord is required with respect to such improvements or alterations, the consent of Sublandord shall also be required; provided that Sublandlord agrees that it will not unreasonably withhold, condition or delay its consent to any alterations or improvements consented to by Overlandlord. Notwithstanding the foregoing, Sublandlord hereby consent to the proposed alterations set forth on Exhibit E ("Subtenant's Proposed Alterations") and the Overlandlord Consent shall provide Overlandlord's consent to such Subtenant's Proposed Alterations. Subtenant shall not be required to remove any such alterations or improvements at the expiration or earlier termination of the Sublease Term unless Sublandlord or Overlandlord provides Subtenant with written notice of such removal requirement at the time it provides consent to such alterations or improvements or, in the case of Subtenant's Proposed Alterations, such removal requirement is specified in Exhibit E or in the Overlandlord's Consent. Subtenant's Proposed Alterations shall be otherwise subject to all requirements of the Lease, including Section 4.2 thereof.

9. Notice. All notices or communications authorized or required hereunder and rent payment shall be given or sent to Sublandlord at Fresenius Medical Care, 920 Winter Street, Waltham, MA 02451 (in the case of rent, to the attention of accounts payable) and to Subtenant at Rapid Micro Biosystems, Inc., Attn: Sean Wirtjes, Chief Financial Officer, 1001 Pawtucket Boulevard, Lowell MA 01854, by certified or registered mail, return receipt requested, or by a national overnight delivery service which maintains delivery records. Either party may by written notice to the other designate another address of such party for the purposes of this section. Sublandlord shall promptly give Sublessee a copy of any notice of default, termination or otherwise affecting the existence or validity of the Sublease or relating to any casualty or taking, given by Sublandlord or Overlandlord to the other.

10. Broker. Subtenant represents and warrants to Sublandlord that it has not directly or indirectly dealt with any broker or agent with respect to the Premises other than CRESA, the "Broker" for purposes of this Sublease.

11. Assignment and Subletting. Notwithstanding any term or provision of the Overlease to the contrary, Subtenant shall not assign this Sublease, sublet all or any part of the Premises, encumber this Sublease or allow any third party to use any portion of the Premises without Overlandlord's consent and Sublandlord's consent, which shall not be unreasonably withheld, conditioned or delayed by Sublandlord.

12. Consent. Whenever any provision of the Overlease requires Overlandlord's consent, the consent of both Overlandlord and Sublandlord shall be required.

13. Overlandlord Termination Right. Sublandlord shall not exercise its termination option under Section 13.39 of the Overlease while this Sublease shall be in effect.

14. Subtenant Termination Option. Provided that there exists no default of Subtenant under Section 12.1 of the Overlease beyond applicable notice and cure periods, at the time Subtenant shall give the termination notice referred to herein, Subtenant shall have the right to terminate this Sublease as of July 31, 2026 (the "Termination Date"), by giving notice to Sublandlord of exercise of such termination right on or before the day which is one (1) year prior to the Termination Date, and, if such notice is given, on the Termination Date this Sublease shall expire just as if such date were the date originally set for expiration of the Sublease Term; provided that Subtenant shall pay Sublandlord the Early Termination Fee within thirty (30) days after the Termination Date. The "Early Termination Fee" shall be the sum of (a) $375,063.75 which represents six (6) months' of the then Base Rent, and (b) $281,175.96 which represents the unamortized portion, as of the Termination Date, of Sublandlord's brokerage expenses and an amount equal to the monthly Fixed Rent from the Commencement Date to the Rent Commencement Date had Fixed Rent been payable during such period, amortized over the term of this Sublease on a level payment direct reduction basis, with interest at six percent (6%) per annum, over the period beginning on Rent Commencement Date.

15. Furniture and Equipment. During the Sublease Term, Subtenant shall have the right to use the furniture and equipment listed in Exhibit B attached hereto (the "FF&E"). Prior to the Commencement Date, Sublandlord shall remove all of its other property from the Premises. Subtenant shall pay as additional rent for the FF&E $6,250 per month on the first day of each month during the Sublease Term. Subtenant shall maintain the FF&E in reasonably good condition, subject to reasonable wear and tear, fire and casualty damage, and provided Subtenant does not exercise the Subtenant Termination Option herein, shall purchase FF&E at the end of the Sublease Term for $1.00 and shall thereafter be responsible for the removal and disposal of the FF&E at Subtenant's sole cost and expense, as well as any damage related to such removal, as required in the Overlease. Subtenant, at its expense, shall maintain full replacement cost all risk insurance on the FF&E naming Sublandlord as loss payee.

16. Exterior Storage. Subject to Overlandlord's and Sublandlord's consents and approvals, which shall not be unreasonably withheld, conditioned or delayed, Subtenant may install an exterior storage facility and/or emergency generator, provided such facility complies with all applicable legal requirements.[2]

17. Consent; Non-disturbance. This Sublease is subject to Sublandlord obtaining Overlandlord's consent hereto, which consent Sublandlord will request promptly upon the execution hereof and shall be in form and substance reasonably acceptable to Subtenant (the "Overlandlord Consent"). The Overlandlord Consent shall (a) expressly permit the use set forth in Section 18 below, and (b) provide Overlandlord's consent to the Subtenant's Proposed Alterations. Sublandlord has obtained from the current mortgagee of the Premises a Subordination, Non-Disturbance and Attornment Agreement, in favor of Subtenant, a copy of which has been provided to Subtenant. The parties shall cooperate reasonably in connection with the application for Overlandlord's Consent and furnish such available documents and information (including, without limitation, information regarding Subtenant's Proposed Alterations) as Overlandlord may reasonably require for such purpose. If the Overlandlord's Consent is not issued within thirty (30) days after the Effective Date, then either party may elect to cancel this Sublease by giving notice of such cancellation to the other after the end of such thirty (30) day period. If either party shall give its cancellation notice, this Sublease shall be cancelled, any advance rent and security previously paid shall be refunded, and neither party shall have any other or further claims arising under this Sublease.

18. Permitted Use. Notwithstanding anything in the Overlease or this Sublease to the contrary, the Permitted Use under this Sublease shall be general office and administrative uses, light manufacturing[3] and all uses permitted by applicable zoning laws and uses ancillary thereto.

19. Entire Agreement/Modification. This Sublease, including the Exhibits, contains all of the agreements of the parties hereto with respect to any matter covered or mentioned in this Sublease, and no prior agreements or understanding or letter or proposal pertaining to any such matters shall be effective for any purpose. This Sublease may only be modified by a writing signed by Sublandlord and Subtenant. No provisions of this Sublease may be amended or added to, whether by conduct, oral or written communication, or otherwise, except by an agreement in writing signed by the parties hereto or their respective successors-in-interest.

20. Interpretation. The title and paragraph headings are not a part of this Sublease and shall have no effect upon the construction or interpretation of any part of this Sublease. Unless stated otherwise, references to paragraphs and subparagraphs are to those in this Sublease. This Sublease shall be strictly construed neither against Sublandlord nor Subtenant.

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[2] To be added to proposed alterations exhibit.

[3] Expanded Permitted Use to be approved in Consent.

Witness the execution hereof under seal as of the date first above written.

SUBLANDLORD

NATIONAL MEDICAL CARE, INC., a Delaware corporation

By /s/[Karen Gledhill]

Its SVP General Counsel

SUBTENANT:

RAPID MICRO BIOSYSTEMS, INC., a Delaware

By /s/[Sean Wirtjes]

Its Chief Financial Officer

Exhibit A
Schedule of Rent

Exhibit B
Furniture and Equipment

Exhibit C
Letter of Credit

Exhibit D
Premises

Exhibit E
Proposed Alterations

Exhibit F
Overlease

Exhibit 10.14

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is not material and would likely cause competitive harm to the registrant if publicly disclosed.

PATENT LICENSE AGREEMENT

This Agreement is made and entered into as of the 13th day of May, 2013 ("Effective Date") by and between Thermo CRS, Ltd., a Canadian corporation and indirect subsidiary of Thermo Fisher Scientific Inc. ("Licensor") and Rapid Micro Biosystems Inc., a Delaware corporation ("Licensee"). Licensor and Licensee may be individually referred to as "Party" and collectively as "Parties."

WHEREAS, Licensor owns and controls U.S. Patent [***], Canadian Patent [***] and European Patent [***] (the "Licensed Patents"); and

WHEREAS, Licensee wishes to obtain a license from Licensor under the Licensed Patents for the purpose of commercializing Licensed Products as defined below.

NOW, THEREFORE, in consideration of the mutual covenants and premised contained herein, the Parties agree as follows:

1. DEFINITIONS

1.1 "Affiliate" means any business entity at least 50% owned by a Party, directly or indirectly, any business entity that owns at least 50% of a Party, directly or indirectly, or any business entity that is at least 50% owned by a business entity that owns at least 50% of the Party.

1.2 "Change in Control" means a transaction or a series of related transactions: (a) in which one or more parties that did not previously own or control greater than fifty percent (50%) equity interest in Licensee obtains ownership or control of greater than fifty percent (50%) equity interest in Licensee; (b) in which Licensee sells all or substantially all of its assets; or (c) a merger of Licensee with or into an un- Affiliated third party, where Licensee is not the surviving entity. Notwithstanding the foregoing, Change in Control shall not include (i) any transaction or series of transactions entered into primarily for equity financing purposes so long as less than 50% of Licensee is owned by entities engaged in the lease or sale of goods or the development of goods for lease or sale or (ii) any public offering of securities.

1.3 "Field" means [***].

1.4 "Licensed Method" means a method, the practice of which is covered by at least one valid claim of any of the Licensed Patent Rights in the country of use.

1.5 "Licensed Patent Rights" means the Licensed Patents and any reissues, reexaminations and extensions.

1.6 "Licensed Product" means a product, the manufacture, use or sale of which is covered by at least one valid claim of any of the Licensed Patent Rights in the country of manufacture, use, or sale.

2. GRANT

2.1 Licensor hereby grants to Licensee a world-wide, royalty-bearing non-exclusive license under the Licensed Patent Rights to develop, manufacture, have manufactured for Licensee, use, distribute, promote, sell, have sold through distributors, import and otherwise commercialize Licensed Products [***] marked with Licensee's own name and trademark(s) for use in the Field, and to convey to its direct and indirect customers the right to practice Licensed Methods and use or resell Licensed Products in the Field.

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is not material and would likely cause competitive harm to the registrant if publicly disclosed.

2.2 Except for the rights expressly conveyed to distributors and to direct and indirect customers in Section 2.1, Licensee receives no right to sublicense under Licensed Patent Rights.

2.3 No right is granted, expressly or by implication, to use Licensed Products outside of the Field or to label Licensed Products with any name or trademark not owned by Licensee or to sell Licensed Products on a stand-alone basis for use [***].

2.4 Licensee shall mark all Licensed Products with U.S. Patent [***] and other granted patents of the Licensed Patent Rights, as appropriate in the jurisdiction of use or sale, shall disclose the format for such patent marking to Licensor and shall comply with Licensor's reasonable instructions regarding modifications to such format.

2.5 In the event that Licensee obtains patent rights based on an application filed after the Effective Date that cover the manufacture and/or use [***] covered by the Licensed Patent Rights, Licensee agrees to make available to Licensor a license to such patent rights under reasonable terms upon Licensor's request. Notwithstanding the foregoing, Licensee is not obligated to offer a license to Licensor to patent rights for the use of [***].

3. FEES AND ROYALTIES

3.1 In partial consideration for rights granted in this Agreement, Licensee shall pay Licensor:

a) forty thousand dollars ($40,000) within ten business days of the completed execution of this Agreement;

b) forty thousand dollars ($40,000) within twelve months after the Effective Date; and

c) forty-five thousand dollars ($45,000) within twenty-four months after the Effective Date.

The payments of 3.1(a) and 3.1(b) shall be non-refundable and non-creditable. The payment of 3.1(c) shall be non-refundable and creditable only against earned royalties with respect to Licensee sales of Licensed Products during calendar year 2015.

3.2 In partial consideration for the rights granted under this Agreement, Licensee shall pay a royalty of:

a) [***] for each system containing [***] Licensed Products, except as such amount is adjusted under Sections 3.3 or 3.4, and

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is not material and would likely cause competitive harm to the registrant if publicly disclosed.

b) [***] per Licensed Product for each system containing [***] Licensed Products other than [***], except as such amount is adjusted under Sections 3.3 or 3.4.

3.3 It is understood that any legal challenge of the subject patents, through USPTO, EPO or other legal proceedings would be costly for the Licensor, and therefore it is agreed that any challenge initiated or facilitated by the Licensee would increase the cost of the license. In the event that Licensee challenges or facilitates a challenge to the validity of any of the Licensed Patent Rights, the above fees shall be increased from [***] to [***] and from [***] to [***], for the current quarter and all subsequent quarters.

3.4 If Licensee is obligated to pay a royalty to a third party on [***] for which a royalty is due to Licensor, then Licensee may reduce the amount payable to Licensor by half of what it pays to the third party; provided that the amount payable to Licensor on each system shall not be reduced under this clause by more than [***] (e.g., from [***] to [***]).

3.5 Licensee shall transmit reports of licensed products sold to Licensor (to Licensor's designated e-mail address with a confirmation copy by regular mail) within [***] days after the end of each calendar quarter (commencing with the first calendar quarter in which a Licensed Product under the license has been sold). Each report shall identify the numbers of units sold (by model number) and calculate the royalties due (after reflecting the amount creditable in 3.1c for reports on sales in a quarter of 2015). The mailed confirmation copy shall be accompanied by payment.

4. TERM AND TERMINATION

4.1 The Agreement shall go into effect as of the Effective Date, provided that the payment of Section 3.1a is made, and shall remain in effect until the last to expire of the Licensed Patent Rights.

4.2 Licensee may terminate at any time, with [***] days prior written notice to Licensor.

4.3 Licensor may terminate for cause, in the event that Licensee is in breach of any obligation under the agreement, after notice of breach with: a) [***] days' notice (unless Licensee cures such notified breach within the [***] day period); and b) effective immediately in the event that Licensee is insolvent, files for bankruptcy or receivership under any applicable law. If the notified breach under (a) is failure to report and pay royalties when due, the notice and cure period shall be shortened to [***] days for the second breach and to no cure period for any subsequent breach.

4.4 Licensor shall also have the right to terminate in the event Licensee challenges or facilitates the challenge of any of the patents or patent applications under Licensed Patent Rights.

4.5 Licensor shall have the right to terminate this Agreement with [***] months prior written notice to Licensee if there is a Change in Control in Licensee and Licensee has failed to obtain Licensor's written consent either prior to its effective date or, if such prior approval is impracticable, within [***] days after its effective date. Licensor shall not unreasonably withhold approval of a Change in Control. Licensor shall have a period to exercise this right of up to [***] months from the date on which Licensor is notified of the Change in Control.

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5. GENERAL PROVISIONS

5.1 This Agreement shall be governed by the laws of Massachusetts. The provisions of the United Nations Convention on Contracts for the International Sale of Goods will not apply to this Agreement.

5.2 This Agreement constitutes the entire and only agreement between the Parties with respect to Licensed Patent Rights and Licensed Products; and all other prior negotiations, representations, agreements, and understandings are superseded hereby. No agreement altering or supplementing the terms hereof may be made except by a written document signed by both Parties.

5.3 This Agreement will not be assigned nor sublicensed by Licensee without Licensor's prior written consent, and any purported assignment or sublicense made without such prior written consent shall be void.

5.4 Notices under this Agreement shall be given in writing, either certified mail or express delivery, to the following addresses or such other as may be provided from time to time under the terms of this notice provision:

If to Licensor: THERMO CRS, LIMITED
5344 John Lucas Drive
Burlington, ON L7L 6A6
Attn: Site Leader

With a copy to: Legal Department
Thermo Fisher Scientific
81 Wyman Street
Waltham, MA 02454-9046

If to Licensee: RAPID MICRO BIOSYSTEMS INC.
One Oak Park Drive
Bedford, MA 01730

5.5 Licensor and its Affiliates DISCLAIM ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL LICENSOR OR ITS AFFILIATES BE LIABLE HEREUNDER TO THE LICENSEE, ITS AFFILIATES, OR ANY OTHER PERSON OR ENTITY FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY OR OTHER INDIRECT DAMAGES (INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR LOSS OF USE DAMAGES) INCURRED BY THE OTHER PARTY OR PERSON AND ARISING FROM ANY MANUFACTURE, USE, OR SALE OF LICENSED PRODUCTS EVEN IF SUCH OTHER PARTY OR PERSON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR LOSSES.

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is not material and would likely cause competitive harm to the registrant if publicly disclosed.

5.6 Licensee shall indemnify, defend and hold harmless Licensor with respect to any third party claim against Licensor arising out of Licensee's manufacture, use or sale of Licensed Products.

5.7 Headings are included herein for convenience only and will not be used to construe this Agreement.

5.8 If any part of this Agreement is for any reason found to be unenforceable, all other parts will remain enforceable to the fullest extent possible.

5.9 This Agreement may be signed in two counterparts transmitted between the Parties as electronic documents, both of which together shall constitute one and the same Agreement, binding on the Parties as if each had signed the same document.

IN WITNESS WHEREOF, Parties hereto have caused their duly authorized representatives to execute this Agreement.

THERMO CRS, LTD		RAPID MICRO BIOSYSTEMS, INC.	
By:	/s/ Hansjoerg Haas	By:	/s/ Stephen H. Delity
Name:	Hansjoerg Haas	Name:	Stephen H. Delity
Title:	Productline Dir.	Title:	President and CEO
Date:	May 13, 2013	Date:	June 10, 2013

LOAN AND SECURITY AGREEMENT

THIS LOAN AND SECURITY AGREEMENT (as the same may be amended, restated, modified, or supplemented from time to time, this "**Agreement**") dated as of May 14, 2020 (the "**Effective Date**") among Kennedy Lewis Management LP ("**KLIM**"), as collateral agent (in such capacity, together with its successors and assigns in such capacity, "**Collateral Agent**"), and the lenders listed on Schedule 1.1 hereof or otherwise a party hereto from time to time (each a "**Lender**" and collectively, the "**Lenders**"), and Rapid Micro Biosystems, Inc., a Delaware corporation ("**Borrower**") and each Guarantor otherwise party hereto from time to time, provides the terms on which the Lenders shall lend to Borrower and Borrower shall repay the Lenders. The parties agree as follows:

1. DEFINITIONS AND OTHER TERMS

1.1 Terms. Capitalized terms used herein shall have the meanings set forth in Section 1.3 to the extent defined therein. All other capitalized terms used but not defined herein shall have the meaning given to such terms in the Code. Any accounting term used but not defined herein shall be construed in accordance with GAAP and all calculations shall be made in accordance with GAAP. The term "financial statements" shall include the accompanying notes and schedules. Notwithstanding anything to the contrary contained herein, (a) all financial statements delivered hereunder shall be prepared, and all financial covenants contained herein shall be calculated, without giving effect to any election under the Statement of Financial Accounting Standards No. 159 (or any similar accounting principle) permitting a Person to value its financial liabilities or Indebtedness at the fair value thereof and (b) the financial statements delivered hereunder with respect to all periods prior to the fiscal quarter ending June 30, 2020, shall be prepared without giving effect to the implementation of Accounting Standards Codification 606: *Revenue from Contracts with Customers*.

1.2 Section References. Any section, subsection, schedule or exhibit references are to this Agreement unless otherwise specified.

1.3 Divisions. For all purposes under the Loan Documents, in connection with any division or plan of division under Delaware law (or any comparable event under a different jurisdiction's laws) with respect to any Person: (a) if any asset, right, obligation or liability of any Person becomes the asset, right, obligation or liability of a different Person, then it shall be deemed to have been transferred from the original Person to the subsequent Person, and (b) if any new Person comes into existence, such new Person shall be deemed to have been organized on the first date of its existence by the holders of its equity interests at such time.

1.4 Definitions. The following terms are defined in the Sections or subsections referenced opposite such terms:

"2020 Budget"	Section 3.1(m)
"Agreement"	Preamble
"Approved Lender"	Section 12.1
"Borrower"	Preamble
"Budget"	Section 6.2(a)(i)
"Claims"	Section 12.2
"Collateral Agent"	Preamble
"Collateral Agent Report"	Exhibit B, Section 5
"Default Rate"	Section 2.3(b)
"Effective Date"	Preamble
"Event of Default"	Section 8
"Excluded Accounts"	Section 6.6(a)
"Excluded Taxes"	Exhibit C, Section 1
"Facility Fee"	Section 2.4(a)
"Future Budgets"	Section 6.2(a)(i)
"Indemnified Person"	Section 12.2
"Indemnified Taxes"	Exhibit C, Section 1
"KLIM"	Preamble

"Lender" and "Lenders"	Preamble
"Lender Transfer"	Section 12.1
"Liquidity Account"	Section 6.12
"Measurement Date"	"Revenue Target" definition
"New Subsidiary"	Section 6.10
"Non-Funding Lender"	Exhibit B, Section 10(c)(ii)
"Open Source Licenses"	Section 5.2(f)
"Other Lender"	Exhibit B, Section 10(c)(ii)
"Perfection Certificate" and "Perfection Certificates"	Section 5.1
"Permitted Senior Debt Priority Collateral"	"Permitted Indebtedness" clause (d)
"Specified Target"	"Revenue Target" definition
"Term A Loan"	Section 2.2(a)(i)
"Term B Loan"	Section 2.2(a)(ii)
"Term C Loan"	Section 2.2(a)(iii)
"Transfer"	Section 7.1

In addition to the terms defined elsewhere in this Agreement, the following terms have the following meanings:

"**Account**" is any "account" as defined in the Code with such additions to such term as may hereafter be made under the Code, and includes, without limitation, all accounts receivable and other sums owing to any Loan Party.

"**Account Debtor**" is any "account debtor" as defined in the Code with such additions to such term as may hereafter be made under the Code.

"**Affiliate**" of any Person is (i) a Person that owns a majority interest in, or controls, directly or indirectly the Person, (ii) any Person that controls or is controlled by or is under common control with the Person, and (iii) each of that Person's senior executive officers, directors, partners and, for any Person that is a limited liability company, that Person's managers and members. For purposes of this definition, control of a Person shall mean the power, direct or indirect, (x) to vote fifteen percent (15%) or more of the equity interests having ordinary voting power for the election of directors of such Person or other Persons performing similar functions for any such Person, or (y) to direct or cause the direction of the management and policies of such Person whether by ownership of equity interests, contract or otherwise. Notwithstanding the foregoing, KLIM and its Affiliates and managed funds shall be deemed not to be Affiliates of the Loan Parties or any of their Subsidiaries for any purpose whatsoever.

"**Amortization Payment Amount**" means, with respect to a given Revenue Target Violation, an amount in cash equal to (i) the outstanding principal amount of the Term Loans determined as of the date of such Revenue Target Violation *divided by* (ii) eight (8).

"**Amortization Payment Date**" is the first (1^{st}) calendar day of each fiscal quarter that follows the occurrence of any Revenue Target Violation and is prior to the occurrence of a Cured Revenue Target Violation with respect to such Revenue Target Violation.

"**Anti-Terrorism Laws**" are any laws, rules, regulations or orders relating to terrorism or money laundering, including without limitation Executive Order No. 13224 (effective September 24, 2001), the USA PATRIOT Act, the laws comprising or implementing the Bank Secrecy Act, and the laws administered by OFAC.

"**Applicable Rate**" means a per annum rate of interest equal to, (i) if any Revenue Target Violation has occurred and is continuing, thirteen percent (13.00%), all of which must be paid in cash, or (ii) otherwise, at Borrower's election pursuant to Section 2.3(a), (a) twelve percent (12.00%), up to seven percent (7.00%) of which may be PIK Interest or (b) thirteen percent (13.00%), all of which may be PIK Interest.

"**Approved Fund**" is any (i) investment company, fund, trust, securitization vehicle or conduit that is (or will be) engaged in making, purchasing, holding or otherwise investing in commercial loans and similar extensions of credit in the ordinary course of its business or (ii) any Person (other than a natural person) which temporarily warehouses loans for any Lender or any entity described in the preceding clause (i) and that, with respect to each of the preceding clauses (i) and (ii), is administered or managed by (a) a Lender, (b) an Affiliate of a Lender or (c) a Person (other than a natural person) or an Affiliate of a Person (other than a natural person) that administers or manages a Lender.

"**BARDA**" means the Biomedical Advanced Research and Development Authority.

"**Blocked Person**" is any Person: (a) listed in the annex to, or is otherwise subject to the provisions of, Executive Order No. 13224, (b) a Person owned or controlled by, or acting for or on behalf of, any Person that is listed in the annex to, or is otherwise subject to the provisions of, Executive Order No. 13224, (c) a Person with which any Lender is prohibited from dealing or otherwise engaging in any transaction by any Anti-Terrorism Law, (d) a Person that commits, threatens or conspires to commit or supports "terrorism" as defined in Executive Order No. 13224, or (e) a Person that is named a "specially designated national" or "blocked person" on the most current list published by OFAC or other similar list.

"**Borrower's Books**" are Borrower's or any of its Subsidiaries' books and records including ledgers, federal, and state tax returns, records regarding Borrower's or its Subsidiaries' assets or liabilities, the Collateral, business operations or financial condition, and all computer programs or storage or any equipment containing such information.

"**Business Day**" is any day that is not a Saturday, Sunday or a day on which commercial banks in New York, New York are required or authorized to be closed.

"**CARES Act**" means the Coronavirus Aid, Relief and Economic Stability Act.

"**Cash Equivalents**" are (a) marketable direct obligations issued or unconditionally guaranteed by the United States or any agency or any State thereof having maturities of not more than one (1) year from the date of acquisition and having the highest rating from either Standard & Poor's Ratings Group or Moody's Investors Service, Inc.; (b) commercial paper maturing no more than one (1) year after its creation and having the highest rating from either Standard & Poor's Ratings Group or Moody's Investors Service, Inc., (c) certificates of deposit maturing no more than one (1) year after issue provided that the account in which any such certificate of deposit is maintained is subject to a Control Agreement in favor of Collateral Agent, and (d) any money market or similar funds that exclusively holds any of the foregoing.

"**Change of Control**" means: (a) any Person or "group" (within the meaning of Rules13d-3 and 13d-5 under the Exchange Act) shall have acquired (i) beneficial ownership of forty nine percent (49.0%) or more on a fully diluted basis of the voting equity interests of Borrower in the aggregate, or (ii) the power (whether or not exercised) to elect a majority of the members of the board of directors (or similar governing body) of Borrower; or (b) other than as expressly permitted under this Agreement, Borrower shall cease to beneficially own and control, directly or indirectly, one hundred percent (100%), on a fully diluted basis, of the economic and voting interest in the equity interests of each of its wholly-owned Subsidiaries.

"**CMO**" means a contract manufacturing organization.

"**Code**" is the Uniform Commercial Code, as the same may, from time to time, be enacted and in effect in the State of New York; provided, that, to the extent that the Code is used to define any term herein or in any Loan Document and such term is defined differently in different Articles or Divisions of the Code, the definition of such term contained in Article or Division 9 shall govern; provided further, that in the event that, by reason of mandatory provisions of law, any or all of the attachment, perfection, or priority of, or remedies with respect to, Collateral Agent's Lien on any Collateral is governed by the Uniform Commercial Code in effect in a jurisdiction other than the State of New York, the term "Code" shall mean the Uniform Commercial Code as enacted and in effect in such other jurisdiction solely for purposes of the provisions thereof relating to such attachment, perfection, priority, or remedies and for purposes of definitions relating to such provisions.

"**Collateral**" is any and all properties, rights and assets of each Loan Party described on Exhibit A.

"**Collateral Account**" is any Deposit Account, Securities Account, Liquidity Account or Commodity Account, or any other bank account maintained by any Loan Party or any Subsidiary at any time.

"**Collateral Agent**" is KLIM, not in its individual capacity, but solely in its capacity as collateral agent on behalf of and for the ratable benefit of the Secured Parties.

"**Commitment Percentage**" is set forth in Schedule 1.1, as amended from time to time.

"**Commodity Account**" is any "commodity account" as defined in the Code with such additions to such term as may hereafter be made under the Code.

"**Compliance Certificate**" is that certain certificate in substantially the form attached hereto as Exhibit E.

"**Consolidated Revenue**" means revenue (determined in accordance with GAAP) of Borrower and its Subsidiaries on a consolidated basis, excluding any revenue arising from BARDA.

"**Contingent Obligation**" is, for any Person, any direct or indirect liability, contingent or not, of that Person for (a) any indebtedness, lease, dividend, letter of credit or other obligation of another such as an obligation directly or indirectly guaranteed, endorsed, co made, discounted or sold with recourse by that Person, or for which that Person is directly or indirectly liable; (b) any obligations for undrawn letters of credit for the account of that Person; and (c) all obligations from any interest rate, currency or commodity swap agreement, interest rate cap or collar agreement, or other agreement or arrangement designated to protect a Person against fluctuation in interest rates, currency exchange rates or commodity prices; but "Contingent Obligation" does not include endorsements in the ordinary course of business. The amount of a Contingent Obligation is the stated or determined amount of the primary obligation for which the Contingent Obligation is made or, if not determinable, the maximum reasonably anticipated liability for it determined by the Person in good faith in accordance with GAAP; but the amount may not exceed the maximum of the obligations under any guarantee or other support arrangement.

"**Control Agreement**" is any control agreement entered into among (a) the depository institution at which any Loan Party or any of its Subsidiaries maintains a Deposit Account or the Liquidity Account or the securities intermediary or commodity intermediary at which any Loan Party or any of its Subsidiaries maintains a Securities Account or a Commodity Account, (b) such Loan Party or such Subsidiary, as applicable, and (c) Collateral Agent, pursuant to which Collateral Agent, for the ratable benefit of the Secured Parties, obtains "control" (within the meaning of the Code) over such Deposit Account, Securities Account, or Commodity Account.

"**Copyrights**" are any and all copyright rights, copyright applications, copyright registrations and like protections in each work or authorship and derivative work thereof, whether published or unpublished and whether or not the same also constitutes a trade secret.

"**CRO**" means a contract research organization.

"**Cured Revenue Target Violation**" means, with respect to any specific Revenue Target Violation, Borrower has achieved the Revenue Target as of the Measurement Date immediately following such Revenue Target Violation.

"**Default**" means any event that, with the giving of notice or the passage of time, or both, would constitute an Event of Default.

"**Deposit Account**" is any "deposit account" as defined in the Code with such additions to such term as may hereafter be made under the Code.

"**Dollars**," "**dollars**" and "**$**" each mean lawful money of the United States.

"**Domestic Subsidiary**" means, in relation to any Person, any Subsidiary of that Person that is not a Foreign Subsidiary.

"**Eligible Assignee**" is (i) a Lender, (ii) an Affiliate of a Lender, (iii) an Approved Fund and (iv) any commercial bank, savings and loan association or savings bank or any other entity which is an "accredited investor" (as defined in Regulation D under the Securities Act of 1933, as amended) and which extends credit or buys loans as one of its businesses, including insurance companies, mutual funds, lease financing companies and commercial finance companies, in each case, which either (A) has a rating of BBB or higher from Standard & Poor's Rating Group and a rating of Baa2 or higher from Moody's Investors Service, Inc. at the date that it becomes a Lender or (B) has total assets in excess of One Billion Dollars ($1,000,000,000.00), and in each case of clauses (i) through (iv), which, through its applicable lending office, is capable of lending to Borrower without the imposition of any withholding or similar Taxes; provided that notwithstanding the foregoing, "Eligible Assignee" shall not include (1) Borrower or any of Borrower's Affiliates or Subsidiaries or (2) so long as no Event of Default has occurred and is continuing, a competitor of Borrower or a vulture fund. Notwithstanding the foregoing, (x) in connection with any assignment by a Lender as a result of a forced divestiture at the request of any regulatory agency, the restrictions set forth herein shall not apply and Eligible Assignee shall mean any Person or party, (y) in connection with a Lender's own financing or securitization transactions, the restrictions set forth herein shall not apply and Eligible Assignee shall mean any Person or party providing such financing or formed to undertake such securitization transaction and any transferee of such Person or party upon the occurrence of a default, event of default or similar occurrence with respect to such financing or securitization transaction; provided that no such sale, transfer, pledge or assignment under this clause (y) shall release such Lender from any of its obligations hereunder or substitute any such Person or party for such Lender as a party hereto until Collateral Agent shall have received and accepted an effective assignment agreement from such Person or party in form satisfactory to Collateral Agent executed, delivered and fully completed by the applicable parties thereto, and shall have received such other information regarding such Eligible Assignee as Collateral Agent reasonably shall require.

"**Equipment**" is all "equipment" as defined in the Code with such additions to such term as may hereafter be made under the Code, and includes without limitation all machinery, fixtures, goods, vehicles (including motor vehicles and trailers), and any interest in any of the foregoing.

"**ERISA**" is the Employee Retirement Income Security Act of 1974, as amended, and its regulations.

"**Exigent Circumstance**" means any event or circumstance that, in the reasonable judgment of Collateral Agent, imminently threatens the ability of Collateral Agent to realize upon all or any material portion of the Collateral, such as, without limitation, fraudulent removal, concealment, or abscondment thereof, destruction or material waste thereof, or failure of any Loan Party or any of its Subsidiaries after reasonable demand to maintain or reinstate adequate casualty insurance coverage, or which, in the judgment of Collateral Agent, could reasonably be expected to result in a material diminution in value of the Collateral.

"**Existing Indebtedness**" is the indebtedness of Borrower pursuant to that certain Loan and Security Agreement, dated April 12, 2018, entered into by and among Borrower, the several banks and other financial institutions or entities from time to time parties thereto, and Hercules, as administrative agent and collateral agent, as amended.

"**FATCA**" means sections 1471 through 1474 of the Internal Revenue Code, as of the date of this Agreement (or any amended or successor version that is substantively comparable and not materially more onerous to comply with), any current or future regulations or official interpretations thereof, any agreements entered into pursuant to Section 1471(b)(1) of the Internal Revenue Code and any fiscal or regulatory legislation, rules or practices adopted pursuant to any intergovernmental agreement, treaty or convention among Governmental Authorities and implementing such sections of the Internal Revenue Code.

"**FDA**" means the U.S. Food and Drug Administration or any successor thereto or any other comparable Governmental Authority.

"**Foreign Subsidiary**" means, in relation to any Person, any Subsidiary of that Person that is organized under the laws of a jurisdiction other than the United States of America or any of the States or the District of Columbia.

"**Funding Date**" is any Business Day on which the Lenders have already made or in the future make a Term Loan to or on account of Borrower.

"**GAAP**" is generally accepted accounting principles set forth in the opinions and pronouncements of the Accounting Principles Board of the American Institute of Certified Public Accountants and statements and pronouncements of the Financial Accounting Standards Board or in such other statements by such other Person as may be approved by a significant segment of the accounting profession in the United States, which are applicable to the circumstances as of the date of determination.

"**General Intangibles**" are all "general intangibles" as defined in the Code in effect on the date hereof with such additions to such term as may hereafter be made under the Code, and includes without limitation, all copyright rights, copyright applications, copyright registrations and like protections in each work of authorship and derivative work, whether published or unpublished, any patents, trademarks, service marks and, to the extent permitted under applicable law, any applications therefor, whether registered or not, any trade secret rights, including any rights to unpatented inventions, payment intangibles, royalties, contract rights, goodwill, franchise agreements, purchase orders, customer lists, route lists, telephone numbers, domain names, claims, income and other tax refunds, security and other deposits, options to purchase or sell real or personal property, rights in all litigation presently or hereafter pending (whether in contract, tort or otherwise), insurance policies (including without limitation key man, property damage, and business interruption insurance), payments of insurance and rights to payment of any kind.

"**Governmental Approval**" is any consent, authorization, approval, order, license, franchise, permit, certificate, accreditation, registration, filing or notice, of, issued by, from or to, or other act by or in respect of, any Governmental Authority.

"**Governmental Authority**" is any nation or government, any state or other political subdivision thereof, any agency, authority, instrumentality, regulatory body (including, without limitation, the FDA), court, central bank or other entity exercising executive, legislative, judicial, taxing, regulatory or administrative functions of or pertaining to government, any securities exchange and any self-regulatory organization.

"**Guarantor**" means any Person providing a Guaranty in favor of Collateral Agent for the benefit of the Secured Parties (including without limitation pursuant to Section 6.10).

"**Guaranty**" is any guarantee of all or any part of the Obligations, as the same may from time to time be amended, restated, modified or otherwise supplemented.

"**Hedging Obligations**" means all liabilities under take-or-pay or similar arrangements or under any interest rate swaps, caps, floors, collars and other interest hedge or protection agreements, treasury locks, equity forward contracts, currency agreements or commodity purchase or option agreements or other interest or exchange rate or commodity price hedging agreements and any other derivative instruments, in each case, whether the Loan Parties and their Subsidiaries are liable contingently or otherwise, as obligor, guarantor or otherwise, or in respect of which liabilities the Loan Parties or their respective Subsidiaries otherwise assures a creditor against loss.

"**Hercules**" means Hercules Capital, Inc.

"**Indebtedness**" is (a) indebtedness for borrowed money or the deferred price of property or services, such as reimbursement and other obligations for surety bonds and letters of credit (excluding trade credit entered into in the ordinary course of business), (b) obligations evidenced by notes, bonds, debentures or similar instruments, (c) capital lease obligations, (d) non-contingent obligations of such Person to reimburse any bank or other Person in respect of amounts paid under a letter of credit, banker's acceptance or similar instrument, (e) equity securities of such Person subject to repurchase or redemption earlier than the 91st day after clause (i) of the definition "Maturity Date" other than at the sole option of such Person, (f) obligations secured by a Lien on any asset of such Person, whether or not such obligation is otherwise an obligation of such Person, (g) "earnouts", purchase price adjustments, profit sharing arrangements, deferred purchase money amounts and similar payment obligations or continuing obligations of any nature of such Person arising out of purchase and sale contracts, (h) all Indebtedness of others guaranteed by such Person, (i) off-balance sheet liabilities and/or material pension plan or multiemployer plan liabilities of such Person, (j) obligations arising under bonus, deferred compensation, incentive compensation or similar arrangements, other than those arising in the ordinary course of business or approved by the board of directors of Borrower and (k) Contingent Obligations.

"**Insolvency Proceeding**" is any proceeding by or against any Person under the United States of America Bankruptcy Code, or any other bankruptcy or insolvency law, including assignments for the benefit of creditors, compositions or proceedings seeking reorganization, arrangement, or other relief.

"**Insolvent**" means not Solvent.

"**Intellectual Property**" means all of each Loan Party's or any of its Subsidiaries' right, title and interest in and to the following:

(a) its Copyrights, Trademarks and Patents;

(b) any and all trade secrets and trade secret rights, including, without limitation, any rights to unpatented inventions, know how, operating manuals;

(c) any and all source code, or pseudo-code, firmware, object code and/or any machine executable version thereof;

(d) any and all design rights which may be available to such Loan Party;

(e) any and all claims for damages by way of past, present and future infringement of any of the foregoing, with the right, but not the obligation, to sue for and collect such damages for said use or infringement of the Intellectual Property rights identified above; and

(f) all amendments, renewals and extensions of any of the Copyrights, Trademarks or Patents.

"**Intellectual Property Security Agreement**" means that certain Intellectual Property Security Agreement dated as of the Effective Date between the Loan Parties and Collateral Agent, as the same may from time to time be amended, restated, modified or otherwise supplemented.

"**Internal Revenue Code**" means the Internal Revenue Code of 1986, as amended.

"**Inventory**" is all "inventory" as defined in the Code in effect on the date hereof with such additions to such term as may hereafter be made under the Code, and includes without limitation all merchandise, raw materials, parts, supplies, packing and shipping materials, work in process and finished products, including without limitation such inventory as is temporarily out of any Person's custody or possession or in transit and including any returned goods and any documents of title representing any of the above.

"**Investment**" is any beneficial ownership interest in any Person (including stock, partnership interest or other securities), and any loan, advance or capital contribution to any Person.

"**Key Person**" is Robert Spignesi, who is the Chief Executive Officer of Borrower as of the Effective Date.

"**Knowledge**" means to the "best of" the applicable Loan Party's knowledge, or with a similar qualification, knowledge or awareness means the actual knowledge, after reasonable investigation, of the Responsible Officers.

"**Lender**" is any one of the Lenders.

"**Lenders**" are the Persons identified on Schedule 1.1 hereto and each assignee that becomes a party to this Agreement pursuant to Section 12.1.

"**Lenders' Expenses**" are (a) all reasonable and documented out-of-pocket fees and expenses, costs, and expenses (including reasonable and documented attorneys' fees and expenses, as well as audit fees, appraisal fees, fees incurred on account of lien searches, inspection fees, and filing fees) for preparing, amending, negotiating and administering the Loan Documents, (b) all out-of-pocket fees and expenses (including attorneys' fees and expenses, as well as audit fees, appraisal fees, fees incurred on account of lien searches, inspection fees, and filing fees) for defending and enforcing the Loan Documents (including, without limitation, those incurred in connection with appeals or Insolvency Proceedings) or otherwise incurred by Collateral Agent and/or the Lenders in connection with enforcing or defending the Loan Documents.

"**Lien**" is a claim, mortgage, deed of trust, levy, charge, pledge, security interest, or other encumbrance of any kind, whether voluntarily incurred or arising by operation of law or otherwise against any property.

"**Loan Documents**" are, collectively, this Agreement, the Warrants, each Control Agreement, the Intellectual Property Security Agreement, the Perfection Certificates, each Compliance Certificate, each Loan Payment Request Form, any Guaranties, any subordination agreements, any intercreditor agreement entered into by Collateral Agent with respect to Permitted Senior Debt, any note, or notes or guaranties executed by any Loan Party or any other Person, any agreements creating or perfecting rights in the Collateral (including all insurance certificates and endorsements, landlord consents and bailee consents) and any other present or future agreement entered into by any Loan Party or any other Person for the benefit of the Lenders and Collateral Agent, as applicable, in connection with this Agreement; all as amended, restated, modified or otherwise supplemented.

"**Loan Party**" means, individually, Borrower and each Guarantor and "**Loan Parties**" means, collectively, Borrower and each Guarantor.

"**Loan Payment Request Form**" is that certain form attached hereto as Exhibit D.

"**Material Adverse Change**" is (a) a material adverse change in the business, operations or financial condition of each Loan Party and its Subsidiaries, when taken as a whole; or (b) a material adverse impairment of (i) the ability of the Loan Parties, when taken as a whole, to repay the Obligations, (ii) the legality, validity or enforceability of any Loan Document, (iii) the rights and remedies of Collateral Agent or Lenders under any Loan Document or (iv) the validity, perfection or priority of any Lien in favor of Collateral Agent for the benefit of the Secured Parties on any of the Collateral.

"**Material Agreement**" is any license, agreement or other contractual arrangement of any Loan Party or any of its Subsidiaries requiring a payment or provision of goods or services by any party thereto or otherwise with a value of more than Five Hundred Thousand Dollars ($500,000.00) in the aggregate over the term thereof.

"**Maturity Date**" is, for each Term Loan, the earlier of (i) May 14, 2025 and (ii) the twenty-fourth (24^{th}) Amortization Payment Date following the occurrence of any Revenue Target Violation that is not a Cured Revenue Target Violation.

"**Maximum Legal Rate**" shall mean the maximum non-usurious interest rate, if any, that at any time or from time to time may be contracted for, taken, reserved, charged or received on the indebtedness provided for herein or the other Loan Documents, under the laws of such state or states whose laws are held by any court of competent jurisdiction to govern the interest rate provisions of the Term Loans.

"**Obligations**" are all of each Loan Party's obligations to pay when due any debts, principal, interest, Lenders' Expenses, the Prepayment Premium, the Facility Fee, and any other amounts such Loan Party owes the Collateral Agent or the Lenders now or later, in connection with, related to, following, or arising from, out of or under, this Agreement or the other Loan Documents (other than the Warrants), or otherwise, and including interest accruing after Insolvency Proceedings begin (whether or not allowed) and debts, liabilities, or obligations of any Loan Party assigned to the Lenders and/or Collateral Agent in connection with this Agreement and the other Loan Documents (other than the Warrants), and the performance of such Loan Party's duties under the Loan Documents (other than the Warrants).

"**OFAC**" is the U.S. Department of Treasury Office of Foreign Assets Control.

"**OFAC Lists**" are, collectively, the Specially Designated Nationals and Blocked Persons List maintained by OFAC pursuant to Executive Order No. 13224, 66 Fed. Reg. 49079 (Sept. 25, 2001) and/or any other list of terrorists or other restricted Persons maintained pursuant to any of the rules and regulations of OFAC or pursuant to any other applicable Executive Orders.

"**Operating Documents**" are, for any Person, such Person's formation documents, as certified by the Secretary of State (or equivalent agency) of such Person's jurisdiction of organization on a date that is no earlier than thirty (30) days prior to the Effective Date, and, (a) if such Person is a corporation, its bylaws in current form, (b) if such Person is a limited liability company, its limited liability company agreement (or similar agreement), and (c) if such Person is a partnership, its partnership agreement (or similar agreement), each of the foregoing with all current amendments or modifications thereto.

"**Other Taxes**" means all present or future stamp, court or documentary, intangible, recording, filing or similar Taxes that arise from any payment made under, from the execution, delivery, performance, enforcement or registration of, from the receipt or perfection of a security interest under, or otherwise with respect to, any Loan Document, except any such Taxes that are Other Connection Taxes imposed with respect to an assignment.

"**Patents**" means (i) all national, regional and international patents and patent applications, including provisional patent applications; (ii) all patent applications filed either from such patents, patent applications or provisional applications or from an application claiming priority from either of these, including divisionals, continuations, continuations-in-part, provisionals, converted provisionals and continued prosecution applications; (iii) any and all patents that have issued or in the future issue from the foregoing patent applications ((i) and (ii)), including utility models, petty patents, innovation patents and design patents and certificates of invention; (iv) any and all extensions or restorations by existing or future extension or restoration mechanisms, including revalidations, reissues, re-examinations and extensions (including any supplementary protection certificates and the like) of the foregoing patents or patent applications ((i), (ii) and (iii)); and (v) any similar rights, including so-called pipeline protection or any importation, revalidation, confirmation or introduction patent or registration patent or patent of additions to any of such foregoing patent applications and patents.

"**Payment Date**" is the first (1^{st}) calendar day of each fiscal quarter, commencing on July 1, 2020.

"**Permitted Acquisition**" means any acquisition (including by way of merger or in-licensing arrangement) by any Loan Party of all or substantially all of the assets of another Person, or of a division or line of business of another Person, or capital stock of another Person, which is conducted in accordance with the following requirements:

(a) the aggregate purchase price of all such acquisitions in the aggregate does not exceed Twenty Five Million Dollars ($25,000,000.00) (excluding any such acquisitions to the extent the purchase price is funded exclusively from the net proceeds of a substantially concurrent issuance of (i) equity interests that do not constitute Indebtedness or (ii) convertible debt securities that constitute Subordinated Debt and, in each case, are issued specifically for the purpose of funding such Permitted Acquisitions);

(b) such acquisition is of a business or Person engaged in the same line of business as Borrower or its Subsidiaries;

(c) if such acquisition is structured as a stock acquisition, then the Person so acquired shall either (i) become a wholly-owned Subsidiary of Borrower or of a Subsidiary and Borrower shall comply, or cause such Subsidiary to comply, with Section 6.10 hereof or (ii) such Person shall be merged with and into such Loan Party (with such Loan Party being the surviving entity);

(d) if such acquisition is structured as an acquisition of assets, such assets shall be acquired by such Loan Party, and shall be free and clear of Liens other than Permitted Liens;

(e) both immediately before and after such acquisition no Default or Event of Default shall have occurred and be continuing;

(f) Borrower has provided Collateral Agent with any term sheet or letter of intent for any such transaction together with all documents to be entered into in connection therewith and all exhibits and schedules thereto, and financial statements of the Person or assets that are the subject of such transaction, together with pro forma combined financial statements, and any other information reasonably requested by Collateral Agent in connection with such acquisition; and

(g) Borrower has delivered to Collateral Agent and each Lender a certificate, certified by a Responsible Officer of Borrower, that such transaction is not expected to materially and adversely affect the Loan Parties' ability to repay the Obligations when due, Collateral Agent's security interest in the Collateral or Collateral Agent's rights and remedies pursuant to the Loan Documents or pursuant to applicable law, in each case, as reasonably determined in good faith by Borrower.

"**Permitted Indebtedness**" is:

(a) The Loan Parties' Indebtedness to the Lenders and Collateral Agent under this Agreement and the other Loan Documents;

(b) Indebtedness existing on the Effective Date and disclosed on the Perfection Certificate;

(c) Subordinated Debt;

(d) Permitted Senior Debt; provided, that, (x) no Default or Event of Default shall have occurred and be continuing both immediately before and immediately after the incurrence of such Indebtedness and (y) not later than concurrently with Borrower or any Subsidiary entering into any Permitted Senior Debt Document, the Collateral Agent (at the direction of the Required Lenders), the Loan Parties and the Permitted Senior Debt Holder shall have entered into an intercreditor agreement reasonably satisfactory to the Required Lenders pursuant to which (A) the Permitted Senior Debt Holder shall be granted a first priority security interest only in the cash (other than cash on deposit in the Liquidity Account), accounts receivable, deposit accounts (other than the Liquidity Account), and inventory and ancillary rights required for the exercise of remedies with respect to the foregoing of Borrower and proceeds thereof (collectively, the "**Permitted Senior Debt Priority Collateral**"), (B) the Collateral Agent, on behalf of the Lenders, shall maintain its security interest as a second priority security interest in the Permitted Senior Debt Priority Collateral, (C) the Collateral Agent, on behalf of the Lenders, shall maintain its first priority security interest in all Collateral of the Loan Parties other than the Permitted Senior Debt Priority Collateral and (D) the Permitted Senior Debt Holder shall not be granted a security interest in any property of the Loan Parties other than the Permitted Senior Debt Priority Collateral;

(e) unsecured Indebtedness to trade creditors incurred in the ordinary course of business;

(f) Indebtedness consisting of capitalized lease obligations and purchase money Indebtedness, in each case incurred by Borrower or any of its Subsidiaries to finance the acquisition, repair, improvement or construction of fixed or capital assets or software of such person, provided that (i) the aggregate outstanding principal amount of all such Indebtedness does not exceed One Million Dollars ($1,000,000.00) at any time and (ii) the principal amount of such Indebtedness does not exceed the cost of the property so acquired or built or of such repairs or improvements financed with such Indebtedness (each measured at the time of such acquisition, repair, improvement or construction is made) plus any reasonable premiums charged;

(g) Indebtedness to the extent the corresponding Investment is permitted under clause (j) of the definition of "Permitted Investments";

(h) Guaranties of Permitted Indebtedness incurred in the ordinary course of business;

(i) Indebtedness that constitutes a Permitted Investment;

(j) reimbursement obligations in connection with letters of credit that are secured by cash and issued on behalf of a Loan Party, not to exceed Five Hundred Thousand Dollars ($500,000.00) at any time outstanding;

(k) advances or deposits received in the ordinary course of business from vendors;

(l) advances or deposits received in the ordinary course of business from customers;

(m) Indebtedness incurred in the ordinary course of business with corporate credit cards not to exceed Five Million Dollars ($5,000,000.00) in the aggregate at any time outstanding;

(n) Indebtedness in respect of netting services, overdraft protections, payment processing, automatic clearinghouse arrangements, arrangements in respect of pooled deposit or sweep accounts, check endorsement guarantees, and otherwise in connection with deposit accounts or cash management services and Indebtedness arising in connection with automated clearing house transfer of funds or the use of other payment processing services, in each case incurred in the ordinary course of business;

(o) Indebtedness consisting of financing of insurance premiums incurred in the ordinary course of business not to exceed at any time the amount of such insurance premiums;

(p) Indebtedness with respect to performance bonds, appeal bonds and other similar obligations not to exceed Five Hundred Thousand Dollars ($500,000.00) in the aggregate;

(q) Hedging Obligations incurred in the ordinary course of business provided such Indebtedness (i) is not for speculative purposes and (ii) does not exceed Five Hundred Thousand Dollars ($500,000.00) in the aggregate;

(r) Indebtedness consisting of a loan under the Paycheck Protection Program of the CARES Act;

(s) Indebtedness incurred as a result of endorsing negotiable instruments received in the ordinary course of the Loan Parties' business;

(t) other unsecured Indebtedness not to exceed Five Hundred Thousand Dollars ($500,000.00) in aggregate principal amount at any time outstanding; and

(u) extensions, refinancings, modifications, amendments and restatements of any items of Permitted Indebtedness described in clause (b), provided that the principal amount thereof is not increased (other than by the amount of capitalized interest or fees thereunder) or the terms thereof are not modified to impose materially more burdensome terms upon the applicable Loan Party, or its Subsidiary, as the case may be.

"**Permitted Investments**" are:

(a) Investments disclosed on the Perfection Certificate and existing on the Effective Date;

(b) Investments consisting of cash and Cash Equivalents;

(c) Investments consisting of the endorsement of negotiable instruments for deposit or collection or similar transactions in the ordinary course of the Loan Parties' business;

(d) Investments consisting of Collateral Accounts in which Collateral Agent has a perfected Lien (subject to the terms of this Agreement) for the ratable benefit of the Secured Parties, except as permitted in Section 6.6 hereof;

(e) Investments in connection with Transfers permitted by Section 7.1 and Investments permitted by Section 7.3;

(f) Investments consisting of travel advances and employee relocation loans and other employee loans and advances in the ordinary course of business not to exceed Two Hundred Fifty Thousand Dollars ($250,000.00) in the aggregate in any fiscal year;

(g) Investments consisting of loans not involving the net transfer on a substantially contemporaneous basis of cash proceeds to employees, officers or directors relating to the purchase of capital stock of Borrower pursuant to employee stock purchase plans or other similar agreements, as approved by Borrower's board of directors and not to exceed Five Million Dollars ($5,000,000.00) in the aggregate.

(h) Investments (including debt obligations) received in connection with the bankruptcy or reorganization of customers or suppliers and in settlement of delinquent obligations of, and other disputes with, customers or suppliers arising in the ordinary course of business;

(i) Investments consisting of notes receivable of, or prepaid royalties and other credit extensions, to customers and suppliers who are not Affiliates, in the ordinary course of business; provided that this paragraph (h) shall not apply to Investments of any Loan Party in any Subsidiary;

(j) Investments in Foreign Subsidiaries other than RMB Europe up to Two Hundred Fifty Thousand Dollars ($250,000.00) per year in the aggregate (provided that such amount shall increase annually by an incremental Two Hundred Fifty Thousand Dollars ($250,000.00) each year following the fiscal year ended December 31, 2020 (e.g. for the fiscal year ending December 31, 2021, such amount shall be Five Hundred Thousand Dollars ($500,000.00) per year in the aggregate), up to a maximum of One Million Five Hundred Thousand ($1,500,000.00) per year in the aggregate);

(k) Investments in RMB Europe by Borrower to fund ordinary course operating expenses required to be paid in the thirty (30) day period following the date of such Investment in an amount not to exceed Four Million Dollars ($4,000,000.00) per year in the aggregate;

(l) Investments (x) by any Loan Party in or to another Loan Party and (y) by non-Loan Party Subsidiaries in or to a Loan Party or non-Loan Party;

(m) non-cash Investments in joint ventures or strategic alliances in the ordinary course of the Loan Parties' business consisting of the non-exclusive licensing of technology, the development of technology or the providing of technical support, not to exceed Seven Hundred Fifty Thousand Dollars ($750,000.00) per year in the aggregate;

(n) Permitted Acquisitions;

(o) the extension of trade credit in the ordinary course of business by a Loan Party or Subsidiary; and

(p) other Investments not to exceed Five Hundred Thousand Dollars ($500,000.00) in the aggregate outstanding at any time.

"**Permitted Licenses**" are (A) licenses of over-the-counter software that is commercially available to the public, and (B) non-exclusive licenses for the use of the Intellectual Property of any Loan Party or any of its Subsidiaries entered into in the ordinary course of business, provided, that, with respect to each such license described in clause (B), the license constitutes an arms-length transaction, the terms of which, on their face, do not provide for a sale or assignment of any Intellectual Property, (C) exclusive licenses for the use of the Intellectual Property of any Loan Party or any of its Subsidiaries entered into in the ordinary course of business (including in connection with agreements with CMOs or CROs), provided, that, with respect to each such license described in this clause (C), the license (i) constitutes an arms-length transaction in the ordinary course of business, the terms of which, on their face, do not provide for a sale or assignment of any Intellectual Property, but that (ii) may be exclusive in respects other than territory and that may be exclusive as to territory only as to discrete geographical areas outside of the United States of America, (D) in-licenses of Intellectual Property of other Persons and (E) exclusive licenses for the use of the Intellectual Property of any Loan Party or any of its Subsidiaries entered into in the ordinary course of business to the extent such licenses are included in distribution agreements entered into by Loan Parties in the ordinary course of business; provided, that, with respect to each such license described in this clause (E), such license is terminable by the applicable Loan Party upon a change in control of such Loan Party.

"**Permitted Liens**" are:

(a) Liens existing and disclosed on the Perfection Certificate on the Effective Date;

(b) Liens securing Indebtedness permitted under clause (f) of the definition of "Permitted Indebtedness," provided that (i) such Liens exist prior to the acquisition of, or attach substantially simultaneous with, or within one hundred twenty (120) days after, the acquisition, lease, repair, improvement or construction of such property financed or leased by such Indebtedness and (ii) such liens do not extend to any property of any Loan Party other than the property (and proceeds thereof) acquired, leased or built, or the improvements or repairs, financed by such Indebtedness (and other property permitted to be financed hereunder by the same vendor as cross-collateral);

(c) Liens arising under this Agreement and the other Loan Documents;

(d) Liens for Taxes, fees, assessments or other government charges or levies, either (i) not due and payable or (ii) being contested in good faith and for which the Loan Parties maintain adequate reserves (unless the amount is not material with respect to its financial condition) on Borrower's Books;

(e) Liens of carriers, landlords, warehousemen, suppliers, mechanics or other Persons that are possessory in nature, and other similar Liens imposed by law, arising in the ordinary course of business so long as such Liens attach only to Inventory, securing liabilities in the aggregate amount not to exceed Two Hundred Fifty Thousand Dollars ($250,000.00), and which are not delinquent or remain payable without penalty or which are being contested in good faith and by appropriate proceedings which proceedings have the effect of preventing the forfeiture or sale of the property subject thereto;

(f) Liens to secure (i) payment of workers' compensation, employment insurance, old age pensions, social security and other like obligations incurred in the ordinary course of business (other than Liens imposed by ERISA) and (ii) deposits in respect of letters of credit, bank guarantees or similar instruments issued for the account of Borrower or any Subsidiary in the ordinary course of business supporting obligations of the type set forth in the preceding clause (i);

(g) Liens incurred in the extension, renewal or refinancing of the indebtedness secured by Liens described in (a) and (b), but any extension, renewal or replacement Lien must be limited to the property encumbered by the existing Lien and the principal amount of the indebtedness may not increase;

(h) leases or subleases of real property granted in the ordinary course of the Loan Parties' or any Subsidiaries' business (or, if referring to another Person, in the ordinary course of such Person's business), and leases, subleases, non-exclusive licenses or sublicenses of personal property (other than Intellectual Property) granted in the ordinary course of the Loan Parties' business (or, if referring to another Person, in the ordinary course of such Person's business), if the leases, subleases, licenses and sublicenses do not prohibit granting Collateral Agent or any Lender a first-priority security interest therein;

(i) banker's liens, rights of setoff and Liens in favor of financial institutions incurred in the ordinary course of business arising in connection with any Loan Party's deposit accounts or securities accounts held at such institutions solely to secure payment of fees and similar costs and expenses and provided such accounts are maintained in compliance with Section 6.6(a) hereof;

(j) Liens arising from judgments, decrees or attachments in circumstances not constituting an Event of Default under Section 8.4 or 8.7;

(k) Permitted Licenses;

(l) Security deposits under real property leases that are made in the ordinary course of business;

(m) easements, zoning restrictions, rights-of-way and similar encumbrances on real property imposed by law or arising in the ordinary course of business, and other minor title imperfections with respect to real property that do not secure any monetary obligations and do not materially detract from the value of the affected property or interfere with the ordinary conduct of business of Borrower or any Subsidiary;

(n) good faith deposits required in connection with a Permitted Acquisition;

(o) to the extent constituting a Lien, escrow arrangements securing indemnification obligations associated with any Permitted Acquisition;

(p) Liens on cash collateral securing reimbursement obligations of the applicable Person under letters of credit to the extent permitted pursuant to clause (j) of the definition of Permitted Indebtedness;

(q) Liens in favor of customs and revenue authorities arising as a matter of law to secure payment of customs duties in connection with the importation of goods;

(r) deposits as security for contested taxes or contested import or customs duties in an aggregate amount not to exceed One Million Dollars ($1,000,000.00);

(s) Liens of Permitted Senior Debt Holders encumbering solely the Permitted Senior Debt Priority Collateral securing only the Permitted Senior Debt;

(t) Liens incurred in the ordinary course of business on cash collateral securing Indebtedness permitted to be incurred pursuant to clause (m) of the definition of Permitted Indebtedness in an amount not to exceed Five Hundred Thousand Dollars ($500,000.00);

(u) Liens incurred in the extension, renewal or refinancing of the indebtedness secured by Liens described above, provided such extension, renewal or refinancing is permitted by the terms of this Agreement and any extension, renewal or replacement Lien is limited to the property encumbered by the existing Lien and the principal amount of the indebtedness does not increase; and

(v) other Liens securing obligations (other than Indebtedness for borrowed money) in an amount not to exceed Five Hundred Thousand Dollars ($500,000.00).

"**Permitted Senior Debt**" means senior secured Indebtedness of Borrower in the form of a revolving credit facility in a maximum principal amount not to exceed $5,000,000.00 (or, in the event Borrower draws the full amount of the Term B Loan, $10,000,000.00 in the aggregate) at any one time outstanding incurred under the Permitted Senior Debt Documents which satisfies the following requirements: (a) Borrower shall have delivered to the Collateral Agent and the Lenders all material Permitted Senior Debt Documents concurrently with its entry into such Permitted Senior Debt Documents, certified by a Responsible Officer of Borrower, (b) no Subsidiary of Borrower shall Guaranty, or provide a Lien with respect to, such Indebtedness if such Subsidiary does not provide a Guaranty of the Obligations (and provide a Lien in support thereof) in accordance with the terms of the Loan Documents and (c) such Indebtedness, if secured, shall be secured solely by the Loan Parties' Permitted Senior Debt Priority Collateral.

"**Permitted Senior Debt Documents**" means each agreement, instrument and document entered into by Borrower or any Subsidiary in connection with the Permitted Senior Debt (and, in the case of such agreements, instruments and documents that are material, in each case in form and substance reasonably satisfactory to the Collateral Agent), as the same may be amended, modified, extended, restated, replaced or supplemented from time to time subject to the terms and provisions of an intercreditor agreement in form and substance acceptable to Collateral Agent in its reasonable discretion in connection therewith; provided that if such documents contain any representations, warranties, covenants or events of default that are more burdensome on the Loan Parties than those contained in the Loan Documents (other than such terms that are specific to an asset based lending facility) then the Loan Parties shall offer to amend the Loan Documents to make the provisions of the Loan Documents consistent with such representations, warranties, covenants or events of default.

"**Permitted Senior Debt Holder**" means any holder of Permitted Senior Debt or any agent thereof.

"**Person**" is any individual, sole proprietorship, partnership, limited liability company, joint venture, company, trust, unincorporated organization, association, corporation, institution, public benefit corporation, firm, joint stock company, estate, entity or government agency.

"**PIK Interest**" means interest payable in-kind by adding an amount equal to the applicable percentage of the Applicable Rate of the outstanding principal amount to the then outstanding principal balance of the applicable Term Loan on a quarterly basis on each Payment Date so as to increase the outstanding principal balance of such Term Loan.

"**Prepayment Premium**" is, with respect to any Term Loan subject to prepayment, refinancing, substitution or replacement prior to the Maturity Date, whether by mandatory or voluntary prepayment (for the avoidance of doubt other than any payment made pursuant to Section 2.2(b)(ii)), acceleration or otherwise (including, but not limited to, upon the occurrence of a bankruptcy or insolvency event (including the acceleration of claims by operation of law)), an additional fee payable to the Lenders in amount equal to:

(i) for a prepayment, refinancing, substitution or replacement made after the Effective Date through the date on or prior to the first anniversary of the Effective Date, eight percent (8.00%) of the principal amount of such Term Loan prepaid;

(ii) for a prepayment, refinancing, substitution or replacement made after the date which is after the first anniversary of the Effective Date through the date on or prior to the second anniversary of the Effective Date, seven percent (7.00%) of the principal amount of such Term Loan prepaid;

(iii) for a prepayment, refinancing, substitution or replacement made after the date which is after the second anniversary of the Effective Date through the date on or prior to the third anniversary of the Effective Date, five percent (5.00%) of the principal amount of such Term Loan prepaid;

(iv) for a prepayment, refinancing, substitution or replacement made after the date which is after the third anniversary of the Effective Date through the date on or prior to the fourth anniversary of the Effective Date, three percent (3.00%) of the principal amount of such Term Loan prepaid; and

(v) for a prepayment, refinancing, substitution or replacement made after the date which is after the fourth anniversary of the Effective Date and prior to the Maturity Date, zero percent (0.00%) of the outstanding Term Loans.

"**Property**" means any interest in any kind of property or asset, whether real, personal or mixed, and whether tangible or intangible.

"**Pro Rata Share**" is, as of any date of determination, with respect to each Lender, a percentage (expressed as a decimal, rounded to the ninth decimal place) determined by dividing the outstanding principal amount of Term Loans held by such Lender by the aggregate outstanding principal amount of all Term Loans.

"**Registered Organization**" is any "registered organization" as defined in the Code with such additions to such term as may hereafter be made under the Code.

"**Registration**" means any registration, authorization, approval, license, permit, clearance, certificate, and exemption issued or allowed by the United States Food and Drug Administration or similar state authorities.

"**Related Persons**" means, with respect to any Person, each Affiliate of such Person and each director, officer, employee, agent, trustee, representative, attorney, accountant and each insurance, environmental, legal, financial and other advisor and other consultants and agents of or to such Person or any of its Affiliates.

"**Required Lenders**" means (i) Lenders holding at least a majority of the aggregate outstanding principal balance of the Term Loan and (ii) KLIM.

"**Requirement of Law**" is as to any Person, the organizational or governing documents of such Person, and any law (statutory or common), treaty, rule or regulation or determination of an arbitrator or a court or other Governmental Authority, in each case applicable to or binding upon such Person or any of its property or to which such Person or any of its property is subject.

"**Responsible Officer**" is any of the President, Chief Executive Officer, or Chief Financial Officer of any Loan Party acting alone.

"**Revenue Target**" means (a) Consolidated Revenue of at least the lesser of (i) Fifty Million Dollars ($50,000,000.00) (or, in the event Borrower draws the full amount of the Term B Loan, Sixty Million Dollars ($60,000,000.00)) and (ii) the applicable Specified Target set forth in the table below, in each case, as determined on a trailing twelve (12) month basis and (b) consolidated consumables and service revenue of at least one hundred percent (100.00%) of the year-over-year historical consolidated consumables and service revenue as set forth in Borrower's consolidated financial statements delivered pursuant to Section 6.2(a)(iii)-6.2(a)(iv) for the corresponding two consecutive fiscal quarters of the immediately preceding fiscal year, in each case of (a) and (b), measured as of the last calendar day of each fiscal quarter beginning with the fiscal quarter ending on March 31, 2021 (each such date, a "**Measurement Date**"):

Date		**Specified Target**
March 31, 2021	$	15,146,243
June 30, 2021	$	17,182,085
September 30, 2021	$	19,827,639
December 31, 2021	$	23,229,125
March 31, 2022	$	26,084,083
June 30, 2022	$	29,053,157
September 30, 2022	$	32,523,822
December 31, 2022	$	36,828,578
March 31, 2023	$	47,543,710
June 30, 2023	$	52,407,154
September 30, 2023	$	57,254,567
December 31, 2023	$	63.533.357
March 31, 2024	$	70,142,462
June 30, 2024	$	76,792,211
September 30, 2024	$	83,692,214
December 31, 2024	$	90,640,300
March 31, 2025 and thereafter	$	98,159,871

"**Revenue Target Violation**" means each instance in which the Loan Parties fail to achieve the applicable Revenue Target with respect to any Measurement Date.

"**RMB Europe**" means Rapid Micro Biosystems Europe GmbH, a limited liability company organized under the laws of Germany.

"**Second Draw Condition**" means Borrower has received, on a cumulative basis, at least either (a) twenty-eight (28) System Orders during the period from January 1, 2020 to June 30, 2021 or (b) thirty-two (32) System Orders during the period from July 1, 2021 to November 14, 2021, in each case, measured on a trailing 12-month basis beginning no earlier than January 1, 2020.

"**Second Draw Period**" is the period commencing on the date Borrower satisfies the Second Draw Condition and ending on November 14, 2021; for the avoidance of doubt, if the Second Draw Condition is not satisfied prior to November 14, 2021, then the Second Draw Period will never be effective.

"**Secured Parties**" means the Collateral Agent and the Lenders.

"**Securities Account**" is any "securities account" as defined in the Code with such additions to such term as may hereafter be made under the Code.

"**Solvent**" means, with respect to any Person, that (a) the fair salable value of such Person's consolidated assets (including goodwill minus disposition costs) exceeds the fair value of such Person's liabilities, (b) such Person is not left with unreasonably small capital giving effect to the transactions contemplated by this Agreement and the other Loan Documents, and (c) such Person is able to pay its debts (including trade debts) as they mature in the ordinary course (without taking into account any forbearance and extensions related thereto).

"**Subordinated Debt**" is indebtedness incurred by any Loan Party or any of its Subsidiaries contractually subordinated to all Indebtedness of such Loan Party and/or its Subsidiaries to the Lenders (pursuant to a subordination, intercreditor, or other similar agreement in form and substance reasonably satisfactory to Collateral Agent and the Required Lenders entered into between Collateral Agent, any Loan Party, and/or any of its Subsidiaries, and the other creditor), on terms acceptable to Collateral Agent and the Required Lenders in their reasonable discretion.

"**Subsidiary**" is, with respect to any Person, any Person of which more than fifty percent (50%) of the voting stock or other equity interests (in the case of Persons other than corporations) is owned or controlled, directly or indirectly, by such Person or through one or more intermediaries.

"**System Orders**" means customer orders that have not been canceled or revoked for Borrower's Growth Direct system measured in a manner consistent with Exhibit H.

"**Taxes**" means all present or future taxes, levies, imposts, duties, deductions, withholdings (including backup withholding), assessments, fees or other charges imposed by any Governmental Authority, including any interest, additions to tax or penalties applicable thereto.

"**Term Loan**" means the Term A Loans, Term B Loans and Term C Loans.

"**Term Loan Commitment**" is, for any Lender, the obligation of such Lender to make a Term Loan, up to the principal amount shown on Schedule 1.1. "**Term Loan Commitments**" means the aggregate amount of such commitments of all Lenders.

"**Terminating Collateral Account**" means each Collateral Account set forth on Schedule 1.2 hereto.

"**Third Draw Condition**" means Borrower has received, on a cumulative basis, at least any of (a) forty-seven (47) System Orders during the period from January 1, 2020 to September 30, 2021, (b) fifty-one (51) System Orders during the period from October 1, 2021 to December 31, 2021, or (c) fifty-four (54) System Orders during the period from January 1, 2022 to May 14, 2022, in each case, measured on a trailing 18-month basis beginning no earlier than January 1, 2020.

"**Third Draw Period**" is the period commencing on the date Borrower satisfies the Third Draw Condition and ending on May 14, 2022; for the avoidance of doubt, if the Third Draw Condition is not satisfied prior to May 14, 2022, then the Third Draw Period will never be effective.

"**Trademarks**" means any trademark and servicemark rights, whether registered or not, applications to register and registrations of the same and like protections, and the entire goodwill of the business of each Loan Party and each of its Subsidiaries connected with and symbolized by such trademarks.

"**Tranche A Warrants**" means Warrants with an aggregate warrant coverage equal to One Million Three Hundred Seventy Five Thousand Dollars ($1,375,000.00) to be issued on the Effective Date with respect to the aggregate commitment amount for the Term A Loan.

"**Tranche B Warrants**" means Warrants with an aggregate warrant coverage equal to One Million One Hundred Thousand Dollars ($1,100,000.00) to be issued on the Funding Date of the Term B Loan with respect to the aggregate commitment amount for the Term B Loan.

"**Tranche C Warrants**" means Warrants with an aggregate warrant coverage equal to Eight Hundred Twenty Five Thousand Dollars ($825,000.00) to be issued on the Funding Date of the Term C Loan with respect to the aggregate commitment amount for the Term C Loan.

"**Unqualified Opinion**" means an opinion on financial statements from an independent certified public accounting firm acceptable to Collateral Agent in its reasonable discretion which opinion shall not include any qualifications but may include any going concern limitations.

"**U.S. Person**" means any Person that is a "United States person" as defined in Section 7701(a)(30) of the Internal Revenue Code.

"**Warrants**" means warrants issued by Borrower in favor of each Lender in number, form and content acceptable to each Lender.

2. LOANS AND TERMS OF PAYMENT

2.1 Promise to Pay. Borrower hereby unconditionally promises to pay each Lender the outstanding principal amount of all Term Loans advanced to Borrower by such Lender and accrued and unpaid interest thereon and any other amounts due hereunder as and when due in accordance with this Agreement.

2.2 Term Loans.

(a) Availability. (i) Subject to the terms and conditions of this Agreement, the Lenders agree, severally and not jointly, to make term loans to Borrower on the Effective Date in an aggregate principal amount of Twenty Five Million Dollars ($25,000,000.00) according to each Lender's Term A Loan Commitment as set forth on Schedule 1.1 hereto (such term loans are hereinafter referred to singly as a "**Term A Loan**", and collectively as the "**Term A Loans**"). After repayment, no Term A Loan may be re-borrowed.

(ii) Subject to the terms and conditions of this Agreement, including satisfaction of the Second Draw Conditions, the Lenders agree, severally and not jointly, during the Second Draw Period, to make term loans to Borrower, upon Borrower's request, in an aggregate principal amount of up to Twenty Million Dollars ($20,000,000.00) according to each Lender's Term B Loan Commitment as set forth on Schedule 1.1 hereto (such term loans are hereinafter referred to singly as a "**Term B Loan**", and collectively as the "**Term B Loans**"). After repayment, no Term B Loan may be re-borrowed.

(iii) Subject to the terms and conditions of this Agreement, including satisfaction of the Third Draw Conditions, the Lenders agree, severally and not jointly, during the Third Draw Period, to make term loans to Borrower, upon Borrower's request, in an aggregate principal amount of up to Fifteen Million Dollars ($15,000,000.00) according to each Lender's Term C Loan Commitment as set forth on Schedule 1.1 hereto (such term loans are hereinafter referred to singly as a "**Term C Loan**", and collectively as the "**Term C Loans**"). After repayment, no Term C Loan may be re-borrowed.

(b) Repayment. Borrower shall make quarterly payments (i) of interest to each Lender in accordance with its Pro Rata Share, as calculated by Collateral Agent (which calculations shall be deemed correct absent manifest error) based upon the effective rate of interest applicable to the Term Loan, as determined in Section 2.3(a), commencing on the first (1st) Payment Date following the Funding Date of each Term Loan, and continuing on the Payment Date of each successive quarter thereafter, and (ii) commencing on each Amortization Payment Date thereafter (if any), until the Revenue Target Violation giving rise to such Amortization Payment Date has become a Cured Revenue Target Violation (but, for the avoidance of doubt, commencing again on any subsequent Amortization Payment Date), of principal in an amount equal to the Amortization Payment Amount. All unpaid principal and accrued and unpaid interest with respect to each such Term Loan is due and payable in full on the Maturity Date. The Term Loans may only be prepaid in accordance with Sections 2.2(c) and 2.2(d).

(c) Mandatory Prepayments. If (i) a Change of Control occurs or (ii) the Term Loans are accelerated in accordance with Section 9 (including upon automatic acceleration as a result of bankruptcy), Borrower shall immediately pay to Lenders in cash, payable to each Lender in accordance with its respective Pro Rata Share, an amount equal to the sum of: (i) all outstanding principal of the Term Loans plus accrued and unpaid interest thereon through the prepayment date, plus (ii) the Prepayment Premium, plus (iii) any other fees payable under this Agreement by reason of such prepayment, plus (iv) all other Obligations that are due and payable, including Lenders' Expenses and any accrued interest (including without limitation any interest accrued at the Default Rate). Notwithstanding (but without duplication with) the foregoing, on the Maturity Date, if any fees payable under this Agreement by reason of such prepayments had not previously been paid in full in connection with the prepayment of the Term Loans, Borrower shall pay any such fees to each Lender in accordance with the terms of this Agreement. For the avoidance of doubt, the Prepayment Premium shall not apply to any payments made pursuant to Section 2.2(b)(ii) resulting from the occurrence of any Revenue Target Violation. The Prepayment Premium shall also be payable in the event the Obligations (and/or this Agreement) are satisfied or released by foreclosure (whether by power of judicial proceeding), deed in lieu of foreclosure or by any other means. EACH LOAN PARTY EXPRESSLY WAIVES (TO THE FULLEST EXTENT IT MAY LAWFULLY DO SO) THE PROVISIONS OF ANY PRESENT OR FUTURE STATUTE OR LAW THAT PROHIBITS OR MAY PROHIBIT THE COLLECTION OF THE FOREGOING PREPAYMENT PREMIUM IN CONNECTION WITH ANY SUCH ACCELERATION.

(d) Permitted Prepayment of Term Loans. Borrower shall have the option to make a voluntary prepayment, in whole or in part, of the outstanding principal balance of the Term Loans advanced by the Lenders under this Agreement, provided Borrower (i) provides written notice to Collateral Agent of its election to prepay the Term Loans at least five (5) Business Days prior to such prepayment; (ii) pays to the Lenders on the date of such prepayment, payable to each Lender in cash in accordance with its respective Pro Rata Share, an amount that is equal to the sum of (A) the outstanding principal of the Term Loans Borrower selects to be prepaid plus accrued and unpaid interest thereon through the prepayment date, (B) the Prepayment Premium relating to the prepaid outstanding principal, (C) any other fees payable under this Agreement by reason of such prepayment plus (D) all other Obligations that are due and payable on such prepayment date, including any Lenders' Expenses and interest at the Default Rate (if any) with respect to any past due amounts; and (iii) all such voluntary partial prepayments shall be in an aggregate minimum amount of $5,000,000.00 and an integral multiple of $1,000,000.00. Prepayments of the Term Loan shall be applied to the Term Loan in inverse order of maturity.

2.3 Payment of Interest on the Term Loans.

(a) Interest Rate. Subject to Section 2.3(b), the principal amount outstanding under the Term Loans shall accrue interest at a fixed per annum rate equal to the Applicable Rate, which interest shall be payable quarterly in arrears in accordance with Sections 2.2(b) and 2.3(e). Borrower may make an election under clause (ii) of the Applicable Rate by delivering irrevocable written notice of such election to Collateral Agent no later than 2:00 p.m. on the day which is three (3) Business Days prior to the first Business Day of each fiscal quarter. In order to elect to pay PIK Interest, Borrower must deliver to Lenders at least three (3) Business Days prior to the applicable Payment Date, a certificate that is executed by an authorized officer of Borrower (i) indicating its choice to pay such interest in-kind, (ii) certifying that the conditions for such in-kind payment have been satisfied and (iii) stating the amount of interest that is being paid in-kind. All PIK Interest shall be payable when the principal amount of the Term Loans are payable in accordance with Sections 2.2(b) and 2.3(e) and on which principal amount interest shall be owed pursuant to this Section 2.3(a). Notwithstanding anything to the contrary herein, Borrower shall not be permitted to pay any PIK Interest if, at the time of Borrower's election to pay PIK Interest (i) an Event of Default has occurred and is continuing and (ii) any Revenue Target Violation has occurred and is continuing. Interest shall accrue on each Term Loan commencing on, and including, the Funding Date of such Term Loan, and shall accrue on the principal amount outstanding under such Term Loan up to but not including the day on which such Term Loan is paid in full.

(b) Default Rate. Immediately upon the occurrence and during the continuance of an Event of Default, all Obligations shall accrue interest at a fixed per annum rate equal to the lesser of (i) the rate that is otherwise applicable thereto plus four percent (4.0%) and (ii) the Maximum Legal Rate (the "**Default Rate**"), unless the Lenders otherwise elect. Payment or acceptance of the increased interest rate provided in this Section 2.3(b) is not a permitted alternative to timely payment and shall not constitute a waiver of any Event of Default or otherwise prejudice or limit any rights or remedies of Collateral Agent.

(c) 360 Day Year. Interest shall be computed on the basis of a three hundred sixty (360) day year for the actual number of days elapsed.

(d) [Reserved].

(e) Payments. Except as otherwise expressly provided herein, all payments by any Loan Party under the Loan Documents shall be made to the respective Lender to which such payments are owed, at such Person's office in immediately available funds on the date specified herein. Unless otherwise provided, interest is payable quarterly on the Payment Date and the Amortization Payment Date, as applicable, of each fiscal quarter. Payments of principal and/or interest received after 2:00 p.m. Eastern time are considered received at the opening of business on the next Business Day. When a payment is due on a day that is not a Business Day, the payment is due the next Business Day and additional fees or interest, as applicable, shall continue to accrue until paid. All payments to be made by any Loan Party hereunder or under any other Loan Document, including payments of principal and interest, and all fees, expenses, indemnities and reimbursements, shall be made without set off, recoupment or counterclaim, in lawful money of the United States and in immediately available funds.

2.4 Fees. The Loan Parties shall pay to Collateral Agent and/or Lenders (as applicable) the following fees, which shall be deemed fully earned and non-refundable upon payment:

(a) Facility Fee. A fully-earned, non-refundable facility fee based on the total Term Loan Commitments (both funded and unfunded) in the amount of Seven Hundred Fifty Thousand Dollars ($750,000.00) (the "***Facility Fee***"), which shall be due on the Effective Date, to be shared between the Lenders in accordance with their respective Pro Rata Shares.

(b) Prepayment Premium. The Prepayment Premium, when due hereunder, to be shared between the Lenders in accordance with their respective Pro Rata Shares.

(c) Lenders' Expenses. All Lenders' Expenses and all out of pocket expenses incurred by the Collateral Agent in connection with the documentation and negotiation of this Agreement and the other Loan Documents through and after the Effective Date, when due.

(d) Fees Generally. Each Loan Party expressly agrees (to the fullest extent that each may lawfully do so) that: (i) each of the fees set forth in this Section 2.4 (including the Prepayment Premium and the Facility Fee) is reasonable and is the product of an arm's length transaction between sophisticated business people, ably represented by counsel; (ii) each of the fees set forth in this Section 2.4 (including the Prepayment Premium and the Facility Fee) shall be payable notwithstanding the then prevailing market rates at the time payment is made; (iii) there has been a course of conduct between Collateral Agent, Lenders and each Loan Party giving specific consideration in this transaction for such agreement to pay each of the fees set forth in this Section 2.4 (including the Prepayment Premium and the Facility Fee) and (iv) each Loan Party shall be estopped hereafter from claiming differently than as agreed to in this paragraph. Each Loan Party expressly acknowledges that its agreement to pay each of the fees set forth in this Section 2.4 (including the Prepayment Premium and the Facility Fee) to Lenders as herein described is a material inducement to Lenders to provide the Term Loan Commitments and make the Term Loans.

2.5 Withholding; Increased Costs. Each Loan Party, Collateral Agent and the Lenders each hereby agree to the terms and conditions set forth on Exhibit C attached hereto.

3. CONDITIONS OF LOANS

3.1 Conditions Precedent to Term A Loan. Each Lender's obligation to make a Term A Loan is subject to the condition precedent that Collateral Agent and each Lender shall consent to or shall have received, in form and substance satisfactory to Collateral Agent and each Lender, such documents, and completion of such other matters, as Collateral Agent and each Lender may reasonably deem necessary or appropriate, including, without limitation:

(a) original Loan Documents, each duly executed by each Loan Party;

(b) a completed Perfection Certificate for each Loan Party and each of its Subsidiaries;

(c) [reserved];

(d) Intellectual Property Security Agreement;

(e) the Operating Documents and good standing certificates of each Loan Party certified by the Secretary of State (or equivalent agency) of each Loan Party's jurisdiction of organization or formation and each jurisdiction in which each Loan Party is qualified to conduct business, each as of a date no earlier than thirty (30) days prior to the Effective Date;

(f) a certificate of each Loan Party executed by the Secretary of each Loan Party with appropriate insertions and attachments, including with respect to (i) the certified Operating Documents of each Loan Party and (ii) the resolutions adopted by each Loan Party's board of directors (or similar governing body) for the purpose of approving the transactions contemplated by the Loan Documents;

(g) certified copies, dated as of date no earlier than thirty (30) days prior to the Effective Date, of financing statement searches, as Collateral Agent shall reasonably request, accompanied by written evidence (including any UCC termination statements) that the Liens indicated in any such financing statements either constitute Permitted Liens or have been or, in connection with the initial Term Loan, will be terminated or released;

(h) a duly executed legal opinion of counsel to the Loan Parties dated as of the Effective Date in form and substance satisfactory to Collateral Agent and the Lenders;

(i) [reserved];

(j) a copy of any applicable Investors Rights Agreement and any amendments thereto, joinders, etc.;

(k) [reserved];

(l) [reserved];

(m) Borrower's consolidated financial projections for each fiscal quarter for the year ending December 31, 2020 developed by the Loan Parties in good faith and as approved by Borrower's board of directors, in form and substance reasonably acceptable to Collateral Agent (the "**2020 Budget**");

(n) payment of the Facility Fee and Lenders' Expenses then due as specified in Section 2.4 hereof;

(o) appropriate financing statements to be filed to perfect the Collateral Agent's Liens in and to the Collateral;

(p) evidence satisfactory to the Collateral Agent that any Indebtedness owing to Hercules has been or will simultaneously be paid in full and terminated in full and that any Liens in connection therewith have been or will simultaneously be released in full and terminated; and

(q) duly executed original Tranche A Warrants, in number, form and content acceptable to each Lender, and in favor of each Lender according to its Commitment Percentage.

3.2 Conditions Precedent to all Term Loans. The obligation of each Lender to extend each Term Loan, including the initial Term Loan, is subject to the following conditions precedent:

(a) receipt by Collateral Agent of an executed Loan Payment Request Form in the form of Exhibit D attached hereto;

(b) the representations and warranties in Section 5 hereof shall be true, accurate and complete in all material respects on the Funding Date of each Term Loan and those representations and warranties expressly referring to a specific date shall be true, accurate and complete in all material respects as of such date (except, in each case, that such materiality qualifier shall not be applicable to any representations and warranties that already are qualified or modified by materiality in the text thereof);

(c) no Default or Event of Default shall have occurred and be continuing or result from the funding of such Term Loan;

(d) in such Lender's reasonable discretion, there has not been any Material Adverse Change;

(e) a completed Perfection Certificate for each Loan Party and each of its Subsidiaries effective as of the Funding Date of each Term Loan;

(f) with respect to any Term B Loan, Collateral Agent shall have received (i) evidence reasonably satisfactory to Collateral Agent that the Second Draw Conditions have been satisfied in full and (ii) duly executed original Tranche B Warrants in the form of Exhibit G, and in favor of each Lender according to its Commitment Percentage;

(g) with respect to any Term C Loan, Collateral Agent shall have received (i) evidence reasonably satisfactory to Collateral Agent that the Third Draw Conditions have been satisfied in full and (ii) duly executed original Tranche C Warrants in the form of Exhibit G, and in favor of each Lender according to its Commitment Percentage;

(h) payment of Lenders' Expenses then due as specified in Section 2.4 hereof; and

(i) such other agreements, instruments, approvals or other documents reasonably requested by Collateral Agent to create, perfect and establish the first priority of, or otherwise protect, any Lien purported to be covered by any Loan Document.

3.3 Covenant to Deliver. Each Loan Party agrees to deliver to Collateral Agent and the Lenders each item required to be delivered to Collateral Agent under this Agreement as a condition precedent to any Term Loan. Each Loan Party expressly agrees that a Term Loan made prior to the receipt by Collateral Agent or any Lender of any such item shall not constitute a waiver by Collateral Agent or any Lender of any Loan Party's obligation to deliver such item, and any such Term Loan in the absence of a required item shall be made in each Lender's sole discretion.

3.4 Procedures for Borrowing. Subject to the prior satisfaction of all other applicable conditions to the making of a Term Loan set forth in this Agreement, to obtain a Term Loan (other than the Term Loan funded on the Effective Date), Borrower shall notify the Lenders (which notice shall be irrevocable) by electronic mail, facsimile, or telephone by 2:00 p.m. New York City time three (3) Business Days prior to the date the Term Loan is to be made. Together with any such electronic, facsimile or telephonic notification, Borrower shall deliver to Collateral Agent by electronic mail or facsimile a completed Loan Payment Request Form executed by a Responsible Officer or his or her designee. The Collateral Agent may rely on any telephone notice given by a person whom Collateral Agent reasonably believes is a Responsible Officer or designee.

3.5 Post-Closing Obligations.

(a) Notwithstanding any provision herein or in any other Loan Document to the contrary, within thirty (30) days after the Effective Date (or such later date as Collateral Agent may agree), deliver to Collateral Agent evidence reasonably satisfactory to Collateral Agent and the Lenders that the insurance policies required by Section 6.5 hereof are in full force and effect, together with appropriate evidence showing loss payable and/or additional insured clauses or endorsements in favor of Collateral Agent, for the ratable benefit of the Secured Parties;

(b) Notwithstanding any provision herein or in any other Loan Document to the contrary, within thirty (30) days after the Effective Date, Borrower shall, and shall cause each Loan Party to, enter into duly executed Control Agreements, in form and substance reasonably satisfactory to the Collateral Agent, with respect to each Collateral Account maintained by each Loan Party (other than the Terminating Collateral Accounts to the extent set forth in clause (c) below); and

(c) Notwithstanding any provision herein or in any other Loan Document to the contrary, (i) Borrower shall, and shall cause each Loan Party to, by June 30, 2020, either (1) deliver evidence, in form and substance reasonably satisfactory to the Collateral Agent, that each Terminating Collateral Account has been closed or (2) enter into duly executed Control Agreements, in form and substance reasonably satisfactory to the Collateral Agent, with respect to each Terminating Collateral Account maintained by each Loan Party, and (ii) Borrower shall not permit the aggregate balance of all Terminating Collateral Accounts to exceed Six Hundred Thousand Dollars ($600,000.00).

(d) Notwithstanding any provision herein or in any other Loan Document to the contrary, within ninety (90) days after the Effective Date, Borrower shall use commercially reasonable efforts to deliver a fully executed landlord waiver with respect to the chief executive office of Borrower as disclosed in the Perfection Certificate dated as of the date hereof, in form and substance reasonably satisfactory to Collateral Agent.

(e) Notwithstanding any provision herein or in any other Loan Document to the contrary, within thirty (30) days after the Effective Date, Borrower shall have delivered to Collateral Agent reasonably satisfactory evidence that each state tax lien listed in Section 8 of the Perfection Certificate dated as of the date hereof has been paid in full and released.

4. CREATION OF SECURITY INTEREST

4.1 Grant of Security Interest. Each Loan Party hereby grants Collateral Agent, for the ratable benefit of the Secured Parties, to secure the payment and performance in full of all of the Obligations, a continuing first priority security interest in, and pledges to Collateral Agent, for the ratable benefit of the Secured Parties, the Collateral, wherever located, whether now owned or hereafter acquired or arising, and all proceeds and products and supporting obligations (as defined in the Code) in respect thereof. If any Loan Party shall acquire any commercial tort claim (as defined in the Code) in an amount greater than One Hundred Thousand Dollars ($100,000.00), such Loan Party shall grant to Collateral Agent, for the ratable benefit of the Secured Parties, a first priority security interest therein and in the proceeds and products and supporting obligations (as defined in the Code) thereof, all upon the terms of this Agreement, with such writing to be in form and substance reasonably satisfactory to Collateral Agent.

If this Agreement is terminated, Collateral Agent's Lien in the Collateral shall continue until the Obligations (other than inchoate indemnity obligations) are repaid in full in cash. Upon payment in full in cash of the Obligations (other than inchoate indemnity obligations) and at such time as the Lenders' obligation to extend Term Loans has terminated, Collateral Agent shall, at the sole cost and expense of the Loan Parties, release its Liens in the Collateral (and execute and deliver any documents or instruments reasonably requested by the Loan Parties in connection therewith, at the sole cost and expense of the Loan Parties) and all rights therein shall revert to the Loan Parties.

4.2 Authorization to File Financing Statements. Each Loan Party hereby authorizes Collateral Agent to file financing statements (including filing financing statements describing the collateral as "all assets" or words of similar effect) or take any other action required to perfect Collateral Agent's security interests in the Collateral (held for the ratable benefit of the Secured Parties), without notice to such Loan Party, with all appropriate jurisdictions to perfect or protect Collateral Agent's interest or rights under the Loan Documents.

5. REPRESENTATIONS AND WARRANTIES

Each Loan Party represents and warrants to Collateral Agent and the Lenders as follows:

5.1 Due Organization, Authorization: Power and Authority. Each Loan Party and each of its Subsidiaries is duly existing and in good standing as a Registered Organization in its respective jurisdiction of organization or formation and such Loan Party and each of its Subsidiaries is qualified and licensed to do business and is in good standing in any jurisdiction in which the conduct of its businesses or its ownership of property requires that it be so qualified except where the failure to do so could not reasonably be expected to have a Material Adverse Change. In connection with this Agreement, each Loan Party and each of its Subsidiaries has delivered to Collateral Agent a completed perfection certificate and any updates or supplements thereto on, before or after the Effective Date, the form of which is attached hereto as Exhibit F (each a "**Perfection Certificate**" and collectively, the "**Perfection Certificates**"). For the avoidance of doubt, Collateral Agent and Lenders agree that Borrower may from time to time update certain information in the Perfection Certificates after the Effective Date to the extent permitted by one or more specific provisions in this Agreement. Each Loan Party represents and warrants that as of the Effective Date and on each date that the Perfection Certificate is required to be updated all the information set forth on the Perfection Certificates is accurate and complete.

The execution, delivery and performance by each Loan Party of the Loan Documents to which it is, or they are, a party have been duly authorized, and do not (i) conflict with any of such Loan Party's Operating Documents, (ii) contravene, conflict with, constitute a default under or violate any material Requirement of Law applicable thereto, (iii) contravene, conflict or violate any applicable order, writ, judgment, injunction, decree, determination or award of any Governmental Authority by which such Loan Party, or any of their property or assets may be bound or affected, (iv) require any action by, filing, registration, or qualification with, or Governmental Approval from, any Governmental Authority (except such Governmental Approvals which have already been obtained and are in full force and effect) or are being obtained pursuant to Section 6.1(b), or (v) constitute an event of default under any Material Agreement by which such Loan Party or any of their respective properties, is bound. No Loan Party is in default under any agreement to which it is a party or by which it or any of its assets is bound in which such default could reasonably be expected to have a Material Adverse Change.

5.2 Collateral.

(a) Each Loan Party has good title to, has rights in, and the power to transfer each item of the Collateral upon which it purports to grant a Lien under the Loan Documents, free and clear of any and all Liens except Permitted Liens, and no Loan Party has any Deposit Accounts, Securities Accounts, Commodity Accounts or other investment accounts other than the Collateral Accounts or the other investment accounts, if any, described in the Perfection Certificates delivered to Collateral Agent in connection herewith in respect of which such Loan Party has given Collateral Agent notice and taken such actions as are necessary to give Collateral Agent a perfected security interest therein as required under this Agreement. The Accounts are bona fide, existing obligations of the Account Debtors.

(b) The security interest granted herein is and shall at all times continue to be a first priority perfected security interest in the Collateral, subject only to Permitted Liens.

(c) On the Effective Date, and except as disclosed on the Perfection Certificate on the date such Perfection Certificate is required to be delivered hereunder (i) the Collateral is not in the possession of any third party bailee, and (ii) no such third party bailee possesses components of the Collateral.

(d) All Inventory and Equipment is of good and marketable quality, free from material defects.

(e) Each Loan Party is the sole (or joint with another Loan Party) owner of the Intellectual Property each respectively purports to own, free and clear of all Liens other than Permitted Liens and Permitted Licenses. Except as disclosed on the Perfection Certificate on the date such Perfection Certificate is required to be delivered hereunder, no Loan Party is a party to, nor is bound by, any Material Agreement. No Patents, registered Trademarks or registered Copyrights, in each case that are material to Borrower's business, is owned by a Subsidiary. Each of the Copyrights, Trademarks and Patents is valid and enforceable and no material part of the Intellectual Property has been judged invalid or unenforceable, in whole or in part. The Perfection Certificate provides a correct and complete list of each of Loan Party's Patents, registered Trademarks, registered Copyrights, and material agreements under which the Loan Party licenses Intellectual Property from third parties (other than shrink-wrap software licenses) or licenses of Intellectual Property to third parties (other than general licenses to use a Loan Party's software in connection with the use of its products). To each Loan Party's knowledge, no party to any of the foregoing contracts, licenses or agreements is in material breach thereof or has failed to perform any material obligations thereunder.

(f) No Loan Party has used any software or other materials that are subject to an open-source or similar license (collectively, "**Open Source Licenses**") in a manner that would cause any software or other materials owned by any Loan Party or used in any Loan Party products to have to be (i) distributed to third parties at no charge or a minimal charge, (ii) licensed to third parties for the purpose of creating modifications or derivative works, or (iii) subject to the terms of such Open Source License.

(g) Each Loan Party has all material rights with respect to Intellectual Property necessary or material in the operation or conduct of such Loan Party's business as currently conducted by such Loan Party.

5.3 Litigation. On the Effective Date, and except as disclosed on the Perfection Certificate on the date such Perfection Certificate is required to be delivered hereunder, there are no actions, suits, investigations, or proceedings pending or, to the Knowledge of the Responsible Officers, threatened in writing by or against any Loan Party that could reasonably be expected to result in a Material Adverse Change. To the knowledge of each Loan Party, neither the Loan Party's use of its Intellectual Property nor the production and sale of any Loan Party products infringes the Intellectual Property or other rights of others if such infringement could reasonably be expected to have a Material Adverse Change.

5.4 No Material Adverse Change; Financial Statements. All consolidated financial statements for the Loan Parties and its consolidated Subsidiaries, delivered to Collateral Agent fairly present, in conformity with GAAP, and in all material respects the consolidated financial condition of the Loan Parties and its consolidated Subsidiaries and the consolidated results of operations of the Loan Parties and its consolidated Subsidiaries as of and for the dates presented. Since December 31, 2019, there has not been a Material Adverse Change.

5.5 Solvency. Each Loan Party is Solvent. Each Loan Party, when taken as a whole, is Solvent.

5.6 Regulatory Compliance. No Loan Party is an "investment company" or a company "controlled" by an "investment company" under the Investment Company Act of 1940, as amended. No Loan Party is engaged as one of its important activities in extending credit for margin stock (under Regulations X, T and U of the Federal Reserve Board of Governors). Each Loan Party has complied in all material respects with the Federal Fair Labor Standards Act. No Loan Party is a "holding company" or an "affiliate" of a "holding company" or a "subsidiary company" of a "holding company" as each term is defined and used in the Public Utility Holding Company Act of 2005. No Loan Party has violated any laws, ordinances or rules, the violation of which could reasonably be expected to have a Material Adverse Change. No Loan Party's properties or assets has been used by such Loan Party or, to such Loan Party's Knowledge, by previous Persons, in disposing, producing, storing, treating, or transporting any hazardous substance other than in material compliance with applicable laws. Each Loan Party has obtained all consents, approvals and authorizations of, made all declarations or filings with, and given all notices to, all Governmental Authorities that are necessary to continue their respective businesses as currently conducted in all material respects.

No Loan Party, any of its Subsidiaries or any of the Loan Parties' or its Subsidiaries' Affiliates or any of their respective agents acting or benefiting in any capacity in connection with the transactions contemplated by this Agreement is (i) in violation of any Anti-Terrorism Law, (ii) engaging in or conspiring to engage in any transaction that evades or avoids, or has the purpose of evading or avoiding or attempts to violate, any of the prohibitions set forth in any Anti-Terrorism Law, or (iii) is a Blocked Person. No Loan Party, any of its Subsidiaries or any of the Loan Parties' or its Subsidiaries' Affiliates or any of their respective agents, acting or benefiting in any capacity in connection with the transactions contemplated by this Agreement, (x) conducts any business or engages in making or receiving any contribution of funds, goods or services to or for the benefit of any Blocked Person, or (y) deals in, or otherwise engages in any transaction relating to, any property or interest in property blocked pursuant to Executive Order No. 13224, any similar executive order or other Anti-Terrorism Law.

5.7 Investments. No Loan Party owns any stock, shares, partnership interests or other equity securities except for Permitted Investments.

5.8 Tax Returns and Payments; Pension Contributions. Each Loan Party has timely filed all required income and other material tax returns and reports (or extensions thereof), and each Loan Party has timely paid all foreign, federal, state, and local Taxes, assessments, deposits and contributions owed by such Loan Party in an amount greater than Two Hundred Fifty Thousand Dollars ($250,000.00), in all jurisdictions in which any such Loan Party is subject to Taxes, including the United States, unless such Taxes are being contested in accordance with the next sentence. Each Loan Party may defer payment of any contested Taxes, provided that such Loan Party, (a) in good faith contests its obligation to pay the Taxes by appropriate proceedings promptly and diligently instituted and conducted; (b) notifies Collateral Agent of the commencement of, and any material development in, the proceeding; and (c) adequate reserves or other appropriate provisions are maintained on the books of such Loan Party, as applicable, in accordance with GAAP. Except as disclosed on the Perfection Certificate, as of the Effective Date no Loan Party is aware of any claims or adjustments proposed for any of such Loan Party's prior Tax years which could result in additional Taxes greater than Fifty Thousand Dollars ($50,000.00) becoming due and payable by any Loan Party. Each Loan Party has paid all amounts necessary to fund all present pension, profit sharing and deferred compensation plans in accordance with their terms, and no Loan Party has, withdrawn from participation in, and have not permitted partial or complete termination of, or permitted the occurrence of any other event with respect to, any such plan which could reasonably be expected to result in any liability of such Loan Party, including any liability to the Pension Benefit Guaranty Corporation or its successors or any other Governmental Authority.

5.9 Use of Proceeds. The Loan Parties shall use the proceeds of the Term Loans to repay Existing Indebtedness, as working capital and to fund its general business requirements, and not for personal, family, household or agricultural purposes.

5.10 Full Disclosure. No written representation, warranty or other statement of any Loan Party or any of its Subsidiaries in any certificate or written statement, when taken as a whole, given to Collateral Agent or any Lender, as of the date such representation, warranty, or other statement was made, taken together with all such written certificates and written statements given to Collateral Agent or any Lender, contains any untrue statement of a material fact or omits to state a material fact necessary to make the statements contained in the certificates or statements not misleading (it being recognized that projections and forecasts provided by the Loan Parties in good faith and based upon reasonable assumptions are not viewed as facts and that actual results during the period or periods covered by such projections and forecasts may differ from the projected or forecasted results).

5.11 No Equity Adjustments. The execution, delivery and performance by each Loan Party of the Loan Documents to which it is, or will be, a party (including, for the avoidance of doubt, each Warrant) will not cause or require any adjustments under Article Fourth, Section B.4 of the Seventh Amended and Restated Certificate of Incorporation of Borrower (or any analogous provision of any future Certificate of Incorporation of Borrower).

6. AFFIRMATIVE COVENANTS

Each Loan Party shall, and shall cause each of its Subsidiaries to, do all of the following:

6.1 Government Compliance.

(a) Other than as specifically permitted hereunder, maintain its and all its Subsidiaries' legal existence and good standing in their respective jurisdictions of organization and maintain qualification in each jurisdiction in which the failure to so qualify could reasonably be expected to have a Material Adverse Change. Comply with all laws, ordinances and regulations to which any Loan Party or any of its Subsidiaries is subject, the noncompliance with which could reasonably be expected to have a Material Adverse Change.

(b) Obtain and keep in full force and effect, all of the Governmental Approvals necessary for the performance by any Loan Party and its Subsidiaries of their respective businesses and obligations under the Loan Documents and the grant of a security interest to Collateral Agent for the ratable benefit of the Secured Parties, in all of the Collateral.

6.2 Financial Statements, Reports, Certificates; Notices.

(a) Deliver to each Lender:

(i) as soon as available after approval thereof by each Loan Party's board of directors (or similar governing body), but no later than the earlier of (x) ten (10) days' after such approval and (y) sixty (60) days after the end of Borrower's fiscal year, Borrower's consolidated annual financial projections for each fiscal quarter of the next fiscal year (if delivered prior to December 31) or of such fiscal year (if delivered in accordance with the preceding clause (y) after December 31), developed by the Loan Parties in good faith and approved by each Loan Party's board of directors (or similar governing body), in form and substance reasonably acceptable to Collateral Agent (the "**Future Budgets**" and, together with the 2020 Budget, the "**Budget**");

(ii) as soon as available, but no later than forty-five (45) days after the last day of each fiscal quarter, a copy of the Budget updated to include the actual amounts for such fiscal quarter and any prior fiscal quarter certified by a Responsible Officer and in a form reasonably acceptable to the Collateral Agent;

(iii) as soon as available, but no later than forty-five (45) days after the last day of each of Borrower's fiscal quarters, a company prepared consolidated and, if prepared by the Loan Parties, consolidating balance sheet, income statement and cash flow statement covering the consolidated operations of Borrower and its consolidated Subsidiaries for such fiscal quarter certified by a Responsible Officer and in a form reasonably acceptable to the Collateral Agent;

(iv) as soon as available, but no later than one hundred eighty (180) days after the last day of Borrower's fiscal year (or, for the fiscal year ended December 31, 2019, two hundred ten (210) days after December 31, 2019) or, if applicable, within five (5) days of filing of the same with the Securities and Exchange Commission, audited consolidated financial statements covering the consolidated operations of Borrower and its consolidated Subsidiaries for such fiscal year, prepared under GAAP, consistently applied, together with an Unqualified Opinion on the financial statements; provided that, if Borrower does not deliver to Lender an Unqualified Opinion on the financial statements or if the certified public accountants opining on such financial statements identify any material weaknesses, Lenders shall have the right to, and Borrower hereby authorizes Lenders to, speak with such certified public accountants regarding such financial statements;

(v) within five (5) days of delivery, copies of all non-ministerial statements, reports and notices made available to any Loan Party's security holders or holders of Subordinated Debt (other than materials provided to members of any Loan Party board of directors solely in their capacities as security holder or holders of Subordinated Debt); provided, however, the foregoing may be subject to such redactions as Borrower determines in good faith are reasonably necessary to (1) preserve the confidentiality of highly sensitive information, (2) prevent impairment of the attorney client privilege or (3) prevent conflict of interest with Lenders; provided, further, that in case of (1) and (2) (solely, in the case of clause (2), to the extent such disclosure is otherwise required under this Agreement), each Lender shall receive notice of (A) the existence of such statement, report or notice and (B) the basis for such exclusion;

(vi) in the event that any Loan Party becomes subject to the reporting requirements under the Securities Exchange Act of 1934, as amended, within five (5) days of filing, all reports on Form 10-K, 10-Q and 8-K filed with the Securities and Exchange Commission;

(vii) together with delivery of the next Compliance Certificate, notice and copies of any amendments of or other changes to (i) the capitalization table of any Loan Party or any of its Subsidiaries and (ii) the respective Operating Documents of any Loan Party or any of its Subsidiaries;

(viii) as soon as available, but no later than forty-five (45) days after the last day of each fiscal quarter (or, if Borrower's unrestricted cash or Cash Equivalents held in Deposit Accounts subject to Control Agreements in favor of the Collateral Agent for the ratable benefit of the Secured Parties total less than Three Million Dollars ($3,000,000.00), no later than thirty (30) days after the last day of each month), a statement of the cash position of the Loan Parties;

(ix) promptly (and in any event, within five (5) Business Days) after reasonable request therefor, statements of accounts for each Deposit Account showing the daily balance of all unrestricted cash and Cash Equivalents therein;

(x) prompt delivery of (and in any event within five (5) Business Days after the same are sent or received) copies of all material correspondence, reports, documents and other filings with any Governmental Authority that could reasonably be expected to have a material adverse effect on any of the Governmental Approvals material to any Loan Party's business or that otherwise could reasonably be expected to have a Material Adverse Change;

(xi) prompt notice (and in any event, within five (5) Business Days) of any event that could (A) reasonably be expected to materially and adversely affect the value of the Intellectual Property (including with respect to the validity, enforceability or ownership status thereof) or (B) could reasonably be expected to result in a Material Adverse Change;

(xii) written notice delivered at least ten (10) days' prior to any Loan Party's creation of a New Subsidiary in accordance with the terms of Section 6.10;

(xiii) written notice delivered at least ten (10) days' prior to any Loan Party's (A) changing its respective jurisdiction of organization, (B) changing its organizational structure or type, (C) changing its respective legal name, or (D) changing any organizational number(s) (if any) assigned by its respective jurisdiction of organization;

(xiv) upon any Loan Party becoming aware of the existence of any Default or Event of Default, prompt (and in any event within three (3) Business Days) written notice of such occurrence, which such notice shall include a reasonably detailed description of such Default or Event of Default and such Loan Party's proposal regarding how to cure such Default or Event of Default;

(xv) prompt notice if any Loan Party or its Subsidiary has Knowledge that any Loan Party, or any Subsidiary or Affiliate of any Loan Party, is listed on the OFAC Lists or (a) is convicted on, (b) pleads *nolo contendere* to, (c) is indicted on, or (d) is arraigned and held over on charges involving money laundering or predicate crimes to money laundering;

(xvi) notice of any commercial tort claim (as defined in the Code) or letter of credit rights (as defined in the Code) in each case in an amount greater than One Hundred Thousand Dollars ($100,000.00) held by any Loan Party and of the general details thereof;

(xvii) promptly (and in any event, within five (5) Business Days) notify Collateral Agent and each Lender of the occurrence of any default or event of default under (i) the Permitted Senior Debt Documents or (ii) any other document or other agreement to which a Loan Party is a party evidencing Indebtedness in excess of Two Hundred Fifty Thousand Dollars ($250,000.00);

(xviii) other information as reasonably requested by Collateral Agent or any Lender; provided, however, the foregoing may be subject to such redactions as Borrower determines in good faith are reasonably necessary to (1) preserve the confidentiality of highly sensitive information, (2) prevent impairment of the attorney client privilege or (3) prevent conflict of interest with Lenders; provided, further, that in each case of (1) and (2) (solely, in the case of clause (2), to the extent such disclosure is otherwise required under this Agreement), each Lender shall receive notice of (A) the existence of such statement, report or notice and (B) the basis for such exclusion; and

(xix) as soon as available, but no later than forty-five (45) days after the last day of each fiscal quarter, record assignments of any later acquired Intellectual Property with the relevant United States recording office and provide Lender with sufficient evidence of such recording so as to enable Lender to perfect and maintain a first priority perfected security interest in such later acquired Intellectual Property.

Notwithstanding the foregoing, the financial statements required to be delivered pursuant to clauses (ii)-(iv) above will be deemed to be delivered on the date on which Borrower posts such documents, or provides a link thereto, on Borrower's website on the internet at Borrower's website address.

(b) Concurrently with the delivery of the financial statements specified in Section 6.2(a)(iii) above but no later than forty-five (45) days after the last day of each fiscal quarter, deliver to each Lender:

(i) a duly completed Compliance Certificate signed by a Responsible Officer;

(ii) copies of any material Governmental Approvals obtained by any Loan Party or any of its Subsidiaries; and

(iii) written notice of the commencement of, and any material development in, the proceedings contemplated by Section 5.8 hereof;

(c) Concurrently with the delivery of the financial statements specified in Section 6.2(a)(iii) above with respect to the fourth quarter of each fiscal year but no later than forty-five (45) days after the last day of Borrower's fiscal year, deliver to each Lender an updated Perfection Certificate to reflect any amendments, modifications and updates, if any, to the Perfection Certificate after the Effective Date to the extent such amendments, modifications and updates are permitted by one or more specific provisions in this agreement;

(d) Keep proper, complete and true books of record and account in accordance with GAAP in all material respects. Each Loan Party shall, and shall cause each of its Subsidiaries to, allow, at the sole cost of such Loan Party, Collateral Agent or any Lender, during regular business hours upon reasonable prior notice (provided that no notice shall be required when an Event of Default has occurred and is continuing), to visit and inspect any of its properties, to examine and make abstracts or copies from any of its books and records, and to conduct a collateral audit and analysis of its operations and the Collateral; and each Loan Party shall, and shall cause each of its Subsidiaries to, allow, at the sole cost of such Loan Party, Collateral Agent or any Lender, discuss the financial and operational performance and future prospects of the Loan Parties and their Subsidiaries with their officers, directors and independent accountants;

(e) Deliver to each Lender prompt written notice (and in any event, within five (5) Business Days) of any litigation or governmental proceedings pending or threatened (in writing) against any Loan Party, which could reasonably be expected to result in a Material Adverse Change.

6.3 Inventory; Returns. Keep all Inventory in good and marketable condition, normal wear and tear excepted, free from material defects. Returns and allowances between any Loan Party, or any of its Subsidiaries, as applicable, and their respective Account Debtors shall follow such Loan Party's, or such Subsidiary's, customary practices as they exist as of the Effective Date. Each Loan Party must promptly notify Collateral Agent and the Lenders of all returns, recoveries, disputes and claims that involve more than Seven Hundred Thousand Dollars ($700,000.00) individually or in the aggregate in any calendar year.

6.4 Taxes; Pensions. Timely file, and require each of its Subsidiaries to timely file (or obtain timely extensions therefor), all required income and other material tax returns and reports and timely pay, and require each of its Subsidiaries to timely pay, all foreign, federal, state, and local Taxes, assessments, deposits and contributions owed by any Loan Party or its Subsidiaries, except as otherwise permitted pursuant to the terms of Section 5.8 hereof, and pay all amounts necessary to fund all present pension, profit sharing and deferred compensation plans in accordance with the terms of such plans.

6.5 Insurance. Keep each Loan Party's and its Subsidiaries' business and the Collateral insured for risks and in amounts standard for companies in each Loan Party's and its Subsidiaries' industry and location and as Collateral Agent may reasonably request. Insurance policies shall be in a form, with companies, and in amounts that are reasonably satisfactory to Collateral Agent and Lenders. All property policies shall have a lender's loss payable endorsement showing Collateral Agent as lender loss payee and shall waive subrogation against Collateral Agent, and all liability policies shall show, or have endorsements showing, Collateral Agent (for the ratable benefit of the Secured Parties), as additional insured. The Collateral Agent shall be named as lender loss payee and/or additional insured with respect to any such insurance providing coverage in respect of any Collateral, and each provider of any such insurance shall agree, by endorsement upon the policy or policies issued by it or by independent instruments furnished to the Collateral Agent, that it will give the Collateral Agent thirty (30) days (ten (10) days for nonpayment of premium) prior written notice before any such policy or policies shall be canceled. At Collateral Agent's reasonable request, the Loan Parties shall deliver to the Collateral Agent electronic copies of policies and evidence of all premium payments. Proceeds payable under any policy shall, at Collateral Agent's option, be payable to Collateral Agent, for the ratable benefit of the Secured Parties, on account of the then-outstanding Obligations. Notwithstanding the foregoing, (a) so long as no Event of Default has occurred and is continuing, the Loan Parties shall have the option of applying the proceeds of any casualty policy within one hundred eighty (180) days of receipt thereof not exceeding Five Hundred Thousand Dollars ($500,000.00) in the aggregate for all losses under all casualty policies in any one year, toward the replacement promptly or repair of destroyed or damaged property; provided that any such replaced or repaired property (i) shall be of equal or like value as the replaced or repaired Collateral and (ii) shall be deemed Collateral in which Collateral Agent has been granted a first priority security interest and (b) after the occurrence and during the continuance of an Event of Default, all proceeds payable under such casualty policy shall, at the option of Collateral Agent, be payable to Collateral Agent, for the ratable benefit of the Lenders, on account of the Obligations, unless such payment could reasonably be expected to result in adverse tax consequences for the Loan Parties. If any Loan Party or any of its Subsidiaries fails to obtain insurance as required under this Section 6.5 or to pay any amount or furnish any required proof of payment to third persons, Collateral Agent and/or any Lender may make (but has no obligation to do so), at such Loan Party's expense, all or part of such payment or obtain such insurance policies required in this Section 6.5, and take any action under the policies Collateral Agent or such Lender deems prudent.

6.6 Operating Accounts.

(a) Maintain each Loan Party's Collateral Accounts at depositary institutions that have agreed to execute Control Agreements in favor of Collateral Agent with respect to such Collateral Accounts. The provisions of the previous sentence shall not apply to Deposit Accounts (i) maintained outside of the United States of America, provided that the aggregate balance thereof shall not exceed Two Hundred Fifty Thousand Dollars ($250,000.00) at any time, (ii) used exclusively to maintain deposits subject to a Lien described in clause (p) of the defined term "Permitted Liens", (iii) that are zero-balance accounts and (iv) exclusively used for payroll, payroll Taxes and other employee wage and benefit payments to or for the benefit of any Loan Party's, employees, provided that the aggregate balance in such accounts does not exceed the amount to be paid on the following pay period (or such minimum amount as may be required by any Requirement of Law with respect to such accounts), as applicable, and as identified to Collateral Agent by Borrower as such in the Perfection Certificate (collectively, the "**Excluded Accounts**"); provided, however, that (y) no Deposit Account that constitute Permitted Senior Debt Priority Collateral shall be an Excluded Account hereunder and (z) Borrower shall not permit the aggregate balance of all Excluded Accounts to exceed Five Hundred Thousand Dollars ($500,000.00). In addition, for each Collateral Account (other than Excluded Accounts) that any Loan Party at any time maintains, such Loan Party shall cause the applicable bank or financial institution at or with which such Collateral Account is maintained to execute and deliver a Control Agreement or other appropriate instrument with respect to such Collateral Account to perfect Collateral Agent's Lien in such Collateral Account (held for the ratable benefit of the Secured Parties) in accordance with the terms hereunder prior to the establishment of such Collateral Account.

(b) No Loan Party shall maintain any Collateral Accounts except Collateral Accounts maintained in accordance with this Section 6.6.

6.7 Protection of Intellectual Property Rights. Each Loan Party and each of its Subsidiaries shall: (a) protect, defend and maintain the validity and enforceability of its respective Intellectual Property that is material to its business; (b) promptly advise Collateral Agent in writing of material infringement by a third party of its respective Intellectual Property; and (c) not allow any of its respective Intellectual Property material to its respective business to be abandoned, forfeited or dedicated to the public without Collateral Agent's prior written consent.

6.8 Litigation Cooperation. Commencing on the Effective Date and continuing through the termination of this Agreement, make available to Collateral Agent and the Lenders, without expense to Collateral Agent or the Lenders, each Loan Party and each of such Loan Party's officers, employees and agents and Borrower's Books, to the extent that Collateral Agent or any Lender may reasonably deem them necessary to prosecute or defend any third party suit or proceeding instituted by or against Collateral Agent or any Lender with respect to any Collateral or relating to such Loan Party.

6.9 Landlord Waivers; Bailee Waivers. In the event that any Loan Party, after the Effective Date, intends to add any new offices or business locations, including warehouses, but excluding locations involving a CMO or a CRO, or otherwise store any portion of the Collateral with, or deliver any portion of the Collateral to, a bailee or warehouseman, then, in the event that the Collateral at any new location or delivered to any bailee or warehouseman is valued (based on book value) in excess of Seven Hundred and Fifty Thousand Dollars ($750,000.00) in the aggregate, the Loan Parties must (i) provide Collateral Agent at least ten (10) days' written notice and (ii) at Collateral Agent's election, the Loan Parties shall use commercially reasonable efforts to deliver a bailee waiver or landlord waiver duly executed and delivered by the applicable Loan Party and such bailee or landlord, as applicable, in form and substance reasonably satisfactory to Collateral Agent.

6.10 Creation/Acquisition of Subsidiaries. Borrower shall cause (i) each Domestic Subsidiary of any Loan Party (each, a "**New Domestic Subsidiary**") and (ii) each Foreign Subsidiary of any Loan Party that has assets or revenue on a consolidated basis with any of its Subsidiaries in excess of Two Million Five Hundred Thousand Dollars ($2,500,000.00) in any trailing twelve (12) month period (each, a "**New Foreign Subsidiary**" and, together with a New Domestic Subsidiary, a "**New Subsidiary**") to, in each case within sixty (60) days, (A) become a Guarantor with respect to the Obligations and a Loan Party for all purposes hereunder and under the other Loan Documents, (B) grant and pledge to Collateral Agent for the ratable benefit of the Secured Parties a perfected first-priority security interest in 100% of the total outstanding capital stock or other equity interests of such New Subsidiary (or, 65% of the total outstanding capital stock or other equity interests of such New Subsidiary if such New Subsidiary is a Foreign Subsidiary), and (C) cause such New Subsidiary to grant and pledge to Collateral Agent for the ratable benefit of the Secured Parties a perfected first-priority security interest in all properties, rights and assets described on Exhibit A of such New Subsidiary. On the date upon which the events in the preceding clause (i) occurs, such New Subsidiary shall (a) comply with each condition set forth in Sections 3.1 hereto and (b) make each representation and warranty set forth in Section 5 hereto as of such date (or, if such representation and warranty speaks as of any earlier date, as of such earlier date).

6.11 Further Assurances. Execute any further instruments and take further action as Collateral Agent or any Lender reasonably requests to perfect or continue Collateral Agent's Lien in the Collateral or to effect the purposes of this Agreement.

6.12 Minimum Liquidity. Commencing on July 1, 2020, Borrower shall (i) maintain, at all times, unrestricted cash or Cash Equivalents of at least One Million Five Hundred Thousand Dollars ($1,500,000.00) in a segregated Deposit Account that is (x) subject to a Control Agreement in favor of the Collateral Agent for the ratable benefit of the Secured Parties, (y) subject to a first-priority perfected Lien in favor of the Collateral Agent for the ratable benefit of the Secured Parties (subject only to customary banker's Liens held by the depository bank at which such Deposit Account is located arising by operation of law, provided that such Liens are in a form that is customary to Liens obtained by depository banks acting in their capacity as a depository bank) and (z) not subject to any Lien of any Person (including the Permitted Senior Debt Holder) other than the Secured Parties (subject only to customary banker's Liens held by the depository bank at which such Deposit Account is located arising by operation of law, provided that such Liens are in a form that is customary to Liens obtained by depository banks acting in their capacity as a depository bank) (the "**Liquidity Account**") and (ii) deliver to the Collateral Agent and each Lender, within ten (10) Business Days of the end of each calendar month, statements of accounts for such Liquidity Account.

7. NEGATIVE COVENANTS

No Loan Party shall, and shall not permit any of its Subsidiaries to, do any of the following without the prior written consent of the Required Lenders:

7.1 Dispositions. Convey, sell, lease, transfer, assign, dispose of, license (collectively, "**Transfer**"), or permit any of its Subsidiaries to Transfer, all or any part of its business or property, except for Transfers (a) of Inventory in the ordinary course of business; (b) of worn out, surplus, uneconomic or obsolete Equipment; (c) constituting Permitted Liens, Permitted Investments and Permitted Licenses; (d) Transfers among Loan Parties; (e) cash or Cash Equivalents pursuant to transactions not prohibited by this Agreement; (f) Transfers of Intellectual Property that are not material to Borrower's business; (g) sales or discounting of delinquent accounts for fair market value in the ordinary course of business and consistent with past practice; and (h) other Transfers of assets having a fair market value in the aggregate not to exceed Five Hundred Thousand Dollars ($500,000.00). Notwithstanding the foregoing, no Loan Party shall permit any Subsidiary that is not a Loan Party to (i) own any Patents, registered Trademarks, registered Copyrights or agreements that is material to such Loan Party's business or (ii) grant any Person other than a Loan Party an irrevocable exclusive license to the Intellectual Property of any Loan Party, in each case other than Permitted Licenses.

7.2 Changes in Business, Management, Ownership, or Business License. (a) Engage in or permit any of its Subsidiaries to engage in any business other than the businesses engaged in by such Loan Party or such Subsidiary, as applicable, as of the Effective Date or reasonably related, complimentary or incidental thereto; (b) liquidate or dissolve, other than dissolutions (other than of Borrower) pursuant to which the assets of a Loan Party are transferred to a Loan Party; (c) fail to provide ten (10) Business Days' notice to Agent following the departure of any Key Person; (d) enter into any transaction or series of related transactions in which, except as permitted by Section 7.3, Borrower ceases to own, directly or indirectly, 100% of the ownership interests in each Subsidiary of Borrower, except in a transaction permitted under Section 7.3 below.

7.3 Merger or Acquisitions. Other than Permitted Acquisitions, merge or consolidate, or permit any of its Subsidiaries to merge or consolidate, with any other Person, or acquire, or permit any of its Subsidiaries to acquire, all or substantially all of the capital stock, shares or property of another Person (other than mergers or consolidations of a Subsidiary into another Subsidiary or into Borrower), unless Borrower is the surviving legal entity of such transaction and no Event of Default is occurring prior thereto or arises as a result therefrom.

7.4 Indebtedness. Create, incur, assume, or be liable for any Indebtedness, or permit any Subsidiary to do so, other than Permitted Indebtedness.

7.5 Encumbrance. Create, incur, allow, or suffer any Lien on any of its property, or assign or convey any right to receive income, including the sale of any Accounts, or permit any Subsidiary to do so, except for Permitted Liens and Transfers expressly permitted by Section 7.1, or permit any Collateral not to be subject to the first priority security interest granted herein (except for Permitted Liens and Transfers expressly permitted by Section 7.1), or enter into any agreement, document, instrument or other arrangement (except with or in favor of Collateral Agent, for the ratable benefit of the Secured Parties) with any Person which directly or indirectly prohibits or has the effect of prohibiting any Loan Party, or any of its Subsidiaries, from assigning, mortgaging, pledging, granting a security interest in or upon, or encumbering any of such Loan Party's or such Subsidiary's Intellectual Property, except as is otherwise permitted in Section 7.1 hereof and the definition of "Permitted Liens".

7.6 Restricted Payments. (a) So long as no Default or Event of Default exists or would result therefrom, (i) declare or pay any dividends or make any other distribution or payment in respect of or redeem, retire or purchase any capital stock (other than (i) the declaration or payment of dividends to any Loan Party, (ii) the declaration or payment of any dividends solely in the form of equity securities, (iii) conversions of convertible securities permitted to be issued under this Agreement into other securities permitted to be issued under this Agreement pursuant to the terms of such convertible securities or otherwise in exchange thereof; provided that all such securities are Subordinated Debt, (iv) purchases of fractional shares of capital stock arising out of stock dividends, splits or combination or business combinations or in connection with exercises or conversions of options, warrants and other convertible securities in an amount not to exceed Two Hundred Thousand Dollars ($200,000) in the aggregate, (v) purchases of shares of capital stock from minority shareholders in an amount not to exceed One Hundred Thousand Dollars ($100,000) in the aggregate, and (vi) repurchases pursuant to the terms of employee stock purchase plans, employee restricted stock agreements, stockholder rights plans, director or consultant stock option plans, or similar plans, provided such repurchases do not exceed One Hundred Thousand Dollars ($100,000.00) in the aggregate in each fiscal year of Borrower); (b) purchase, redeem, defease or prepay any principal of, premium, if any, interest or other amount payable in respect of any Indebtedness prior to its scheduled maturity, other than the Obligations in accordance with the terms hereof and the Permitted Senior Debt, unless such Indebtedness is being replaced with Indebtedness of at least the same principal amount and such new Indebtedness is Permitted Indebtedness, or (c) be a party to or bound by an agreement that restricts a Subsidiary from paying dividends or otherwise distributing property to any Loan Party.

7.7 Investments. Directly or indirectly make any Investment other than Permitted Investments, or permit any of its Subsidiaries to do so other than Permitted Investments.

7.8 Transactions with Affiliates. Directly or indirectly enter into or permit to exist any material transaction with any Affiliate of any Loan Party or any of its Subsidiaries, except for (a) transactions that are in the ordinary course of such Loan Party's or such Subsidiary's business, upon fair and reasonable terms that are no less favorable to such Loan Party or such Subsidiary than would be obtained in an arm's length transaction with a non-affiliated Person, (b) Subordinated Debt, (c) compensation related arrangements (i) in the ordinary course of business or (ii) otherwise approved by Collateral Agent in writing in its reasonable discretion, (d) transactions permitted pursuant to Section 7.3, (e) distributions permitted under Section 7.6, (f) Permitted Investments, (g) equity investments in Borrower to the extent such equity investments do not constitute Indebtedness, and (h) transactions among Loan Parties.

7.9 Payments of Other Indebtedness. (a) Make or permit any payment on any Subordinated Debt, except pursuant to the terms of the subordination, intercreditor, or other similar agreement to which such Subordinated Debt is subject, or (b) amend any provision in any document relating to the Subordinated Debt without Collateral's Agent's written consent.

7.10 Compliance. (a) Be required to register as an "investment company" or a company controlled by a company required to register as an "investment company", under the Investment Company Act of 1940, as amended, or undertake as one of its important activities extending credit to purchase or carry margin stock (as defined in Regulation U of the Board of Governors of the Federal Reserve System), or use the proceeds of any Term Loan for that purpose; (b) fail to meet the minimum funding requirements of ERISA; (c) permit a Reportable Event or Prohibited Transaction, as defined in ERISA, to occur; (d) fail to comply with the Federal Fair Labor Standards Act or violate any other law or regulation, in each case of clauses (b) and (d), if the applicable violation could reasonably be expected to have a Material Adverse Change; or (e) withdraw from participation in, permit partial or complete termination of, or permit the occurrence of any other event with respect to, any present pension, profit sharing and deferred compensation plan which could reasonably be expected to have a Material Adverse Change.

7.11 Compliance with Anti-Terrorism Laws. No Loan Party nor any of its Subsidiaries shall, nor shall any Loan Party or any of its Subsidiaries permit any Affiliate to, directly or indirectly, knowingly enter into any documents, instruments, agreements or contracts with any Person listed on the OFAC Lists. No Loan Party nor any of its Subsidiaries, nor shall any Loan Party or any of its Subsidiaries permit any Affiliate to, shall directly or indirectly, (a) conduct any business or engage in any transaction or dealing with any Blocked Person, including, without limitation, the making or receiving of any contribution of funds, goods or services to or for the benefit of any Blocked Person, (b) deal in, or otherwise engage in any transaction relating to, any property or interests in property blocked pursuant to Executive Order No. 13224 or any similar executive order or other Anti-Terrorism Law, or (c) engage in or conspire to engage in any transaction that evades or avoids, or has the purpose of evading or avoiding, or attempts to violate, any of the prohibitions set forth in Executive Order No. 13224 or other Anti-Terrorism Law.

7.12 Operating Documents. No Loan Party shall amend, modify or otherwise change any of its Operating Documents in any manner materially adverse to the Secured Parties without the prior written consent of Collateral Agent and the Required Lenders.

8. EVENTS OF DEFAULT

Any one of the following shall constitute an event of default (an "**Event of Default**") under this Agreement:

8.1 Payment Default. Any Loan Party fails to (a) make any payment of principal or interest on any Term Loan on its due date, or (b) pay any other Obligation within three (3) Business Days after such Obligations are due and payable (which three (3) Business Day grace period shall not apply to payments due on the Maturity Date or the date of acceleration pursuant to Section 9.1(a) hereof);

8.2 Covenant Default.

(a) Any Loan Party fails or neglects to perform any obligation in Sections 6.2 (Financial Statements, Reports, Certificates; Notices), 6.3 (Inventory; Returns) 6.4 (Taxes; Pensions), 6.5 (Insurance), 6.6 (Operating Accounts), 6.7 (Protection of Intellectual Property Rights), 6.9 (Landlord Waivers; Bailee Waivers), 6.10 (Creation/Acquisition of Subsidiaries), 6.12 (Minimum Liquidity) or any Loan Party violates any provision in Section 7; or

(b) Any Loan Party fails or neglects to perform, keep, or observe any other term, provision, condition, covenant or agreement contained in this Agreement or any other Loan Document to which such person is a party, and as to any default (other than those specified in this Section 8) under such other term, provision, condition, covenant or agreement that can be cured, has failed to cure the default within thirty (30) days after the occurrence thereof; provided, however, that if the default cannot by its nature be cured within the thirty (30) day period or cannot after diligent attempts by such Loan Party, as applicable, be cured within such thirty (30) day period, and such default is likely to be cured within a reasonable time, then such Loan Party shall have an additional period (which shall not in any case exceed thirty (30) days) to attempt to cure such default, and within such reasonable time period the failure to cure the default shall not be deemed an Event of Default (but no Term Loans shall be made during such cure period);

8.3 Material Adverse Change. A Material Adverse Change has occurred;

8.4 Attachment; Levy; Restraint on Business.

(a) (i) The service of process seeking to attach, by trustee or similar process, any funds of any Loan Party or any of its Subsidiaries, or of any entity under control of any Loan Party or its Subsidiaries, on deposit with any institution at which any Loan Party or any of its Subsidiaries maintains a Collateral Account, or (ii) a notice of lien, levy, or assessment (other than a Permitted Lien) is filed against any Loan Party or any of its Subsidiaries or their respective assets by any government agency, and the same under subclauses (i) and (ii) of this clause (a) are not, within ten (10) days after the occurrence thereof, discharged or stayed (whether through the posting of a bond or otherwise); and

(b) (i) any material portion of any Loan Party's or any of its Subsidiaries' assets is attached, seized, levied on, or comes into possession of a trustee or receiver, or (ii) any court order enjoins, restrains, or prevents any Loan Party or any of its Subsidiaries' from conducting any material part of its business;

8.5 Insolvency. (a) any Loan Party or any of its Subsidiaries is or becomes Insolvent; (b) any Loan Party or any of its Subsidiaries begins an Insolvency Proceeding; or (c) an Insolvency Proceeding is begun against any Loan Party or any of its Subsidiaries and not dismissed or stayed within forty-five (45) days (but no Term Loans shall be extended while any Loan Party or any of its Subsidiaries is Insolvent and/or until any Insolvency Proceeding is dismissed);

8.6 Other Agreements. There is any unwaived default (and such default continues after the applicable grace, cure or notice period) in any agreement to which any Loan Party or any of its Subsidiaries is a party with a third party or parties resulting in a right by such third party or parties, whether or not exercised, to accelerate the maturity of any Indebtedness in an amount in excess of Five Hundred Thousand Dollars ($500,000.00) or that could reasonably be expected to have a Material Adverse Change;

8.7 Judgments. One or more judgments, orders, or decrees for the payment of money in an amount, individually or in the aggregate, of at least Five Hundred Thousand Dollars ($500,000.00) (not covered by independent third party insurance as to which (a) any Loan Party reasonably believes such insurance carrier will accept liability, (b) any Loan Party or the applicable Subsidiary as submitted such claim to such insurance carrier (c) liability has not been rejected by such insurance carrier) shall be rendered against any Loan Party or any of its Subsidiaries and shall remain unsatisfied, unvacated, or unstayed for a period of ten (10) days after the entry thereof; or (d) Borrower or any of its Subsidiaries is enjoined or in any way prevented by court order or pursuant to the terms of any settlement entered into from conducting any material part of its business;

8.8 Misrepresentations. Any Loan Party or any of its Subsidiaries or any Person acting for any Loan Party or any of its Subsidiaries makes any representation, warranty, or other statement now or later in this Agreement, any Loan Document or in any writing delivered to Collateral Agent and/or the Lenders or to induce Collateral Agent and/or the Lenders to enter this Agreement or any Loan Document, and such representation, warranty, or other statement, when taken as a whole, is incorrect in any material respect when made;

8.9 Subordinated Debt. A default or breach occurs under any subordination agreement, or any creditor that has signed such an agreement with Collateral Agent or the Lenders breaches any terms of such agreement;

8.10 Permitted Senior Debt. There occurs an "Event of Default" (or any comparable term) under, and as defined in, any Permitted Senior Debt Document, or a default or breach occurs under any intercreditor agreement entered into by the Collateral Agent with respect thereto;

8.11 Guaranty. (a) Any Guaranty terminates or ceases for any reason to be in full force and effect other than as a result of a transaction permitted under this Agreement in accordance with its terms; (b) any Guarantor does not perform any obligation or covenant under any Guaranty, after any applicable grace or cure period or (c) any circumstance described in Section 8 occurs with respect to any Guarantor, beyond any applicable grace or cure period;

8.12 Governmental Approvals. Any Governmental Approval shall have been revoked, rescinded, suspended, modified in an adverse manner, or not renewed in the ordinary course for a full term and such revocation, rescission, suspension, modification or non-renewal has resulted or could reasonably be expected to result in a Material Adverse Change; or

8.13 Lien Priority. Except as the result of the action of the Collateral Agent or the Lenders, any Lien created hereunder or by any other Loan Document shall at any time fail to constitute a valid and perfected Lien on any non-immaterial portion of the Collateral that is purported to be secured thereby, subject to no prior or equal Lien, other than Permitted Liens.

For the avoidance of doubt, no Revenue Target Violation shall constitute a Default or Event of Default.

9. RIGHTS AND REMEDIES

9.1 Rights and Remedies.

(a) Upon the occurrence and during the continuance of an Event of Default, Collateral Agent may, without notice or demand, do any or all of the following: (i) deliver notice of the Event of Default to any Loan Party, (ii) by notice to any Loan Party declare all Obligations immediately due and payable (but if an Event of Default described in Section 8.5 occurs all Obligations shall be immediately due and payable without any action by Collateral Agent or the Lenders) or (iii) by notice to any Loan Party suspend or terminate the obligations, if any, of the Lenders to advance money or extend credit for any Loan Party's benefit under this Agreement or under any other agreement between any Loan Party and Collateral Agent and/or the Lenders (but if an Event of Default described in Section 8.5 occurs all obligations, if any, of the Lenders to advance money or extend credit for any Loan Party's benefit under this Agreement or under any other agreement between any Loan Party and Collateral Agent and/or the Lenders shall be immediately terminated without any action by Collateral Agent or the Lenders).

(b) Without limiting the rights of Collateral Agent and the Lenders set forth in Section 9.1(a) above, upon the occurrence and during the continuance of an Event of Default, Collateral Agent shall have the right, without notice or demand, to do any or all of the following:

(i) foreclose upon and/or sell or otherwise liquidate the Collateral;

(ii) make a demand for payment upon any Guarantor pursuant to the Guaranty delivered by such Guarantor;

(iii) apply to the Obligations any (A) balances and deposits of the Loan Parties that Collateral Agent or any Lender holds or controls (including without limitation amounts held in any Collateral Account), (B) any amount held or controlled by Collateral Agent or any Lender owing to or for the credit or the account of any Loan Party, or (C) amounts received from any Guarantor in accordance with the respective Guaranty delivered by such Guarantor; and/or

(iv) commence and prosecute an Insolvency Proceeding or consent to any Loan Party commencing any Insolvency Proceeding.

(c) Without limiting the rights of Collateral Agent and the Lenders set forth in Sections 9.1(a) and (b) above, upon the occurrence and during the continuance of an Event of Default, Collateral Agent shall have the right, without notice or demand, to do any or all of the following:

(i) settle or adjust disputes and claims directly with Account Debtors for amounts on terms and in any order that Collateral Agent considers advisable, notify any Person owing any Loan Party money of Collateral Agent's security interest in such funds, and verify the amount of such account;

(ii) make any payments and do any acts it considers necessary or reasonable to protect the Collateral and/or its Liens in the Collateral (held for the ratable benefit of the Secured Parties). The Loan Parties shall assemble the Collateral if Collateral Agent requests and make it available at such location as Collateral Agent reasonably designates. Collateral Agent may enter premises where the Collateral is located, take and maintain possession of any part of the Collateral, and pay, purchase, contest, or compromise any Lien which appears to be prior or superior to its security interest and pay all expenses incurred. Each Loan Party grants Collateral Agent a license to enter and occupy any of its premises, without charge, to exercise any of Collateral Agent's rights or remedies;

(iii) ship, reclaim, recover, store, finish, maintain, repair, prepare for sale, and/or advertise for sale, any of the Collateral. Collateral Agent is hereby granted a non-exclusive, royalty free license or other right to use, without charge, each Loan Party's and each of its Subsidiaries' labels, patents, copyrights, mask works, rights of use of any name, trade secrets, trade names, trademarks, service marks, and advertising matter, or any similar property as it pertains to the Collateral, in completing production of, advertising for sale, and selling any Collateral and, in connection with Collateral Agent's exercise of its rights under this Section 9.1, each Loan Party's and each of its Subsidiaries' rights under all licenses and all franchise agreements inure to Collateral Agent, for the benefit of the Lenders;

(iv) place a "hold" on any Collateral Account maintained with Collateral Agent or any Lender or otherwise in respect of which a Control Agreement has been delivered in favor of Collateral Agent (for the ratable benefit of the Secured Parties) and/or deliver a notice of exclusive control, any entitlement order, or other directions or instructions pursuant to any Control Agreement or similar agreements providing control of any Collateral;

(v) demand and receive possession of Borrower's Books;

(vi) appoint a receiver to seize, manage and realize any of the Collateral, and such receiver shall have any right and authority as any competent court will grant or authorize in accordance with any applicable law, including any power or authority to manage the business of any Loan Party or any of its Subsidiaries; and

(vii) subject to clauses 9.1(a) and (b), exercise all rights and remedies available to Collateral Agent and each Lender under the Loan Documents or at law or equity, including all remedies provided under the Code (including disposal of the Collateral pursuant to the terms thereof).

Notwithstanding any provision of this Section 9.1 to the contrary, upon the occurrence and during the continuance of any Event of Default, Collateral Agent shall have the right to exercise any and all remedies referenced in this Section 9.1 without the written consent of Required Lenders following the occurrence of an Exigent Circumstance.

9.2 Power of Attorney. Each Loan Party hereby irrevocably appoints Collateral Agent as its lawful attorney in fact, exercisable upon the occurrence and during the continuance of an Event of Default, to: (a) endorse any Loan Party's or any of its Subsidiaries' name on any checks or other forms of payment or security; (b) sign any Loan Party's or any of its Subsidiaries' name on any invoice or bill of lading for any Account or drafts against Account Debtors; (c) settle and adjust disputes and claims about the Accounts of any Loan Party directly with the applicable Account Debtors, for amounts and on terms Collateral Agent determines reasonable; (d) make, settle, and adjust all claims under any Loan Party's insurance policies; (e) pay, contest or settle any Lien, charge, encumbrance, security interest, and adverse claim in or to the Collateral, or any judgment based thereon, or otherwise take any action to terminate or discharge the same; and (f) transfer the Collateral into the name of Collateral Agent or a third party as the Code or any applicable law permits. Each Loan Party hereby appoints Collateral Agent as its lawful attorney in fact to sign any Loan Party's or any of its Subsidiaries' name on any documents necessary to perfect or continue the perfection of Collateral Agent's security interest in the Collateral regardless of whether an Event of Default has occurred until all Obligations (other than inchoate indemnity obligations) have been satisfied in full and Collateral Agent and the Lenders are under no further obligation to make or extend Term Loans hereunder. Collateral Agent's foregoing appointment as any Loan Party's or any of its Subsidiaries' attorney in fact, and all of Collateral Agent's rights and powers, are coupled with an interest and are irrevocable until all Obligations (other than inchoate indemnity obligations) have been fully repaid and performed and Collateral Agent's and the Lenders' obligation to provide Term Loans terminates.

9.3 Protective Payments. If any Loan Party or any of its Subsidiaries fail to obtain the insurance called for by Section 6.5 or fails to pay any premium thereon or fails to pay any other amount which any Loan Party or any of its Subsidiaries is obligated to pay under this Agreement or any other Loan Document, Collateral Agent may obtain such insurance or make such payment, and all amounts so paid by Collateral Agent are Lenders' Expenses and immediately due and payable, bearing interest at the Default Rate, and secured by the Collateral. Collateral Agent will make reasonable efforts to provide any Loan Party with notice of Collateral Agent obtaining such insurance or making such payment at the time it is obtained or paid or within a reasonable time thereafter. No such payments by Collateral Agent are deemed an agreement to make similar payments in the future or Collateral Agent's waiver of any Event of Default.

9.4 Application of Payments and Proceeds. Notwithstanding anything to the contrary contained in this Agreement, upon the occurrence and during the continuance of an Event of Default, (a) each Loan Party irrevocably waives the right to direct the application of any and all payments at any time or times thereafter received by Collateral Agent from or on behalf of any Loan Party or any of its Subsidiaries of all or any part of the Obligations, and, as between each Loan Party on the one hand and Collateral Agent and Lenders on the other, Collateral Agent shall have the continuing and exclusive right to apply and to reapply any and all payments received against the Obligations in such manner as Collateral Agent may deem advisable notwithstanding any previous application by Collateral Agent, and (b) the proceeds of any sale of, or other realization upon all or any part of the Collateral shall be applied: first, to the Lenders' Expenses; second, to accrued and unpaid interest on the Obligations (including any interest which, but for the provisions of the United States Bankruptcy Code, would have accrued on such amounts); third, to the principal amount of the Obligations outstanding; and fourth, to any other Obligations owing to Collateral Agent or any Lender under the Loan Documents. Any balance remaining shall be delivered to Borrower or to whoever may be lawfully entitled to receive such balance or as a court of competent jurisdiction may direct. In carrying out the foregoing, (x) amounts received shall be applied in the numerical order provided until exhausted prior to the application to the next succeeding category, and (y) each of the Persons entitled to receive a payment in any particular category shall receive an amount equal to its pro rata share of amounts available to be applied pursuant thereto for such category. Any reference in this Agreement to an allocation between or sharing by the Lenders of any right, interest or obligation "ratably," "proportionally" or in similar terms shall refer to the Lenders' Pro Rata Shares unless expressly provided otherwise. Collateral Agent, or if applicable, each Lender, shall promptly remit to the other Lenders such sums as may be necessary to ensure the ratable repayment of each Lender's Pro Rata Share of any Term Loan and the ratable distribution of interest, fees and reimbursements paid or made by any Loan Party. Notwithstanding the foregoing, a Lender receiving a scheduled payment shall not be responsible for determining whether the other Lenders also received their scheduled payment on such date; provided, however, if it is later determined that a Lender received more than its Pro Rata Share of scheduled payments made on any date or dates, then such Lender shall remit to Collateral Agent or other the Lenders such sums as may be necessary to ensure the ratable payment of such scheduled payments, as instructed by Collateral Agent. If any payment or distribution of any kind or character, whether in cash, properties or securities, shall be received by a Lender in excess of its Pro Rata Share, then the portion of such payment or distribution in excess of such Lender's Pro Rata Share shall be received and held by such Lender in trust for and shall be promptly paid over to the other Lenders (in accordance with their respective Pro Rata Shares) for application to the payments of amounts due on such other Lenders' claims. To the extent any payment for the account of any Loan Party is required to be returned as a voidable transfer or otherwise, the Lenders shall contribute to one another as is necessary to ensure that such return of payment is on a pro rata basis. If any Lender shall obtain possession of any Collateral, it shall hold such Collateral for itself and as agent and bailee for the Secured Parties for purposes of perfecting Collateral Agent's security interest therein (held for the ratable benefit of the Secured Parties).

9.5 Liability for Collateral. So long as Collateral Agent and the Lenders comply with reasonable practices regarding the safekeeping of the Collateral in the possession or under the control of Collateral Agent and the Lenders, Collateral Agent and the Lenders shall not be liable or responsible for: (a) the safekeeping of the Collateral; (b) any loss or damage to the Collateral; (c) any diminution in the value of the Collateral; or (d) any act or default of any carrier, warehouseman, bailee, or other Person. The Loan Parties bear all risk of loss, damage or destruction of the Collateral.

9.6 No Waiver; Remedies Cumulative. Failure by Collateral Agent or any Lender, at any time or times, to require strict performance by any Loan Party of any provision of this Agreement or by any Loan Party or any other Loan Document shall not waive, affect, or diminish any right of Collateral Agent or any Lender thereafter to demand strict performance and compliance herewith or therewith. No waiver hereunder shall be effective unless signed by Collateral Agent and the Required Lenders and then is only effective for the specific instance and purpose for which it is given. The rights and remedies of Collateral Agent and the Lenders under this Agreement and the other Loan Documents are cumulative. Collateral Agent and the Lenders have all rights and remedies provided under the Code, any applicable law, by law, or in equity. The exercise by Collateral Agent or any Lender of one right or remedy is not an election, and Collateral Agent's or any Lender's waiver of any Event of Default is not a continuing waiver. Collateral Agent's or any Lender's delay in exercising any remedy is not a waiver, election, or acquiescence.

9.7 Demand Waiver. Each Loan Party waives, to the fullest extent permitted by law, demand, notice of default or dishonor, notice of payment and nonpayment, notice of any default, nonpayment at maturity, release, compromise, settlement, extension, or renewal of accounts, documents, instruments, chattel paper, and guarantees held by Collateral Agent or any Lender on which any Loan Party or any Subsidiary is liable.

10. NOTICES

Other than as specifically provided herein, all notices, consents, requests, approvals, demands, or other communication by any party to this Agreement or any other Loan Document must be in writing and shall be deemed to have been validly served, given, or delivered: (a) upon the earlier of actual receipt and three (3) Business Days after deposit in the U.S. mail, first class, registered or certified mail return receipt requested, with proper postage prepaid; (b) upon transmission, when sent by facsimile transmission; (c) one (1) Business Day after deposit with a reputable overnight courier with all charges prepaid; or (d) when delivered, if electronically delivered (with delivery confirmation) or hand delivered by messenger, all of which shall be addressed to the party to be notified and sent to the address, facsimile number, or email address indicated below. Any of Collateral Agent, Lender or the Loan Parties may change its email address, mailing address or facsimile number by giving the other party written notice thereof in accordance with the terms of this Section 10.

If to any Loan Party:	RAPID MICRO BIOSYSTEMS, INC. 1001 Pawtucket Blvd. West, Suite 280 Lowell, Massachusetts 01854 Attention: Sean Wirtjes, Chief Financial Officer Email: [XXX]@rapidmicrobio.com
with a copy (which shall not constitute notice) to:	LATHAM & WATKINS LLP 200 Clarendon Street Boston, Massachusetts 02116 Attention: Stephen Ranere Facsimile: (617) 948-6001 Email: [XXX]@lw.com
If to Collateral Agent:	KENNEDY LEWIS MANAGEMENT LP 80 Broad Street, 22nd Floor New York, New York 10004 Attention: Anthony Pasqua Email: [XXX]@klimllc.com
with a copy (which shall not constitute notice) to:	AKIN GUMP STRAUSS HAUER & FELD LLP 2300 N. Field Street, Suite 1800 Dallas, Texas 75201 Attention: Matthew D. Bivona Facsimile: (214) 969-4343 Email: [XXX]@akingump.com

11. CHOICE OF LAW, VENUE AND JURY TRIAL WAIVER

11.1 Waiver of Jury Trial. EACH LOAN PARTY, COLLATERAL AGENT AND LENDERS UNCONDITIONALLY WAIVES ANY AND ALL RIGHT TO A JURY TRIAL OF ANY CLAIM OR CAUSE OF ACTION BASED UPON OR ARISING OUT OF THIS AGREEMENT, ANY OF THE OTHER LOAN DOCUMENTS, ANY OF THE INDEBTEDNESS SECURED HEREBY, ANY DEALINGS AMONG EACH LOAN PARTY, COLLATERAL AGENT AND/OR LENDERS RELATING TO THE SUBJECT MATTER OF THIS TRANSACTION OR ANY RELATED TRANSACTIONS, AND/OR THE RELATIONSHIP THAT IS BEING ESTABLISHED AMONG EACH LOAN PARTY, COLLATERAL AGENT AND/OR LENDERS. THE SCOPE OF THIS WAIVER IS INTENDED TO BE ALL ENCOMPASSING OF ANY AND ALL DISPUTES THAT MAY BE FILED IN ANY COURT. THIS WAIVER IS IRREVOCABLE. THIS WAIVER MAY NOT BE MODIFIED EITHER ORALLY OR IN WRITING. THE WAIVER ALSO SHALL APPLY TO ANY SUBSEQUENT AMENDMENTS, RENEWALS, SUPPLEMENTS OR MODIFICATIONS TO THIS AGREEMENT, ANY OTHER LOAN DOCUMENTS, OR TO ANY OTHER DOCUMENTS OR AGREEMENTS RELATING TO THIS TRANSACTION OR ANY RELATED TRANSACTION. THIS AGREEMENT MAY BE FILED AS A WRITTEN CONSENT TO A TRIAL BY THE COURT.

11.2 Governing Law and Jurisdiction. THIS AGREEMENT, THE OTHER LOAN DOCUMENTS (EXCLUDING THOSE LOAN DOCUMENTS THAT BY THEIR OWN TERMS ARE EXPRESSLY GOVERNED BY THE LAWS OF ANOTHER JURISDICTION) AND THE RIGHTS AND OBLIGATIONS OF THE PARTIES HEREUNDER AND THEREUNDER SHALL IN ALL RESPECTS BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH, THE INTERNAL LAWS OF THE STATE OF NEW YORK (WITHOUT REGARD TO THE CONFLICT OF LAWS PRINCIPLES THAT WOULD RESULT IN THE APPLICATION OF ANY LAW OTHER THAN THE LAW OF SUCH STATE), INCLUDING ALL MATTERS OF CONSTRUCTION, VALIDITY AND PERFORMANCE, REGARDLESS OF THE LOCATION OF THE COLLATERAL, PROVIDED, HOWEVER, THAT IF THE LAWS OF ANY JURISDICTION OTHER THAN NEW YORK SHALL GOVERN IN REGARD TO THE VALIDITY, PERFECTION OR EFFECT OF PERFECTION OF ANY LIEN OR IN REGARD TO PROCEDURAL MATTERS AFFECTING ENFORCEMENT OF ANY LIENS IN COLLATERAL, SUCH LAWS OF SUCH OTHER JURISDICTIONS SHALL CONTINUE TO APPLY TO THAT EXTENT.

11.3 Submission to Jurisdiction. Any legal action or proceeding with respect to the Loan Documents shall be brought exclusively in the courts of the State of New York located in the City of New York, Borough of Manhattan, or of the United States of America for the Southern District of New York and, by execution and delivery of this Agreement, each Loan Party hereby accepts for itself and in respect of its Property, generally and unconditionally, the jurisdiction of the aforesaid courts. Notwithstanding the foregoing, Collateral Agent and Lenders shall have the right to bring any action or proceeding against any Loan Party (or any property of any Loan Party) in the court of any other jurisdiction Collateral Agent or Lenders deem necessary or appropriate in order to realize on the Collateral or other security for the Obligations. The parties hereto hereby irrevocably waive any objection, including any objection to the laying of venue or based on the grounds of *forum non conveniens* that any of them may now or hereafter have to the bringing of any such action or proceeding in such jurisdictions.

11.4 Service of Process. Each Loan Party irrevocably waives personal service of any and all legal process, summons, notices and other documents and other service of process of any kind and consents to such service in any suit, action or proceeding brought in the United States of America with respect to or otherwise arising out of or in connection with any Loan Document by any means permitted by applicable requirements of law, including by the mailing thereof (by registered or certified mail, postage prepaid) to the address of the Loan Parties specified herein (and shall be effective when such mailing shall be effective, as provided therein). Each Loan Party agrees that a final judgment in any such action or proceeding shall be conclusive and may be enforced in other jurisdictions by suit on the judgment or in any other manner provided by law.

11.5 Non-exclusive Jurisdiction. Nothing contained in this Article 11 shall affect the right of Collateral Agent or Lenders to serve process in any other manner permitted by applicable requirements of law or commence legal proceedings or otherwise proceed against any Loan Party in any other jurisdiction.

12. GENERAL PROVISIONS

12.1 Successors and Assigns. This Agreement binds and is for the benefit of the successors and permitted assigns of each party. No Loan Party may transfer, pledge or assign this Agreement or any rights or obligations under it without Collateral Agent's prior written consent (which may be granted or withheld in Collateral Agent's discretion, subject to Section 12.5). The Lenders have the right, without the consent of or notice to any Loan Party, to sell, transfer, assign, pledge, negotiate, or grant participation in (any such sale, transfer, assignment, negotiation, or grant of a participation, a "**Lender Transfer**") all or any part of, or any interest in, the Lenders' obligations, rights, and benefits under this Agreement and the other Loan Documents; provided, however, that any such Lender Transfer (other than (i) any Transfer at any time that an Event of Default has occurred and is continuing or (ii) a transfer, pledge, sale or assignment to an Eligible Assignee) of its obligations, rights, and benefits under this Agreement and the other Loan Documents shall require the prior written consent of the Collateral Agent (such approved assignee, an "**Approved Lender**"). Each Loan Party and Collateral Agent shall be entitled to continue to deal solely and directly with such Lender in connection with the interests so assigned until Collateral Agent shall have received and accepted an effective assignment agreement in form reasonably satisfactory to Collateral Agent executed, delivered and fully completed by the applicable parties thereto, and shall have received such other information regarding such Eligible Assignee or Approved Lender as Collateral Agent reasonably shall require. The Collateral Agent, acting solely for this purpose as an agent of Borrower, shall maintain at one of its offices a copy of each assignment delivered to it and a register for the recordation of the names and addresses of the Lenders, and the Term Loan Commitments of, and principal amounts (and stated interest) of the Term Loans owing to, each Lender pursuant to the terms hereof from time to time (the "**Register**"). The entries in the Register shall be conclusive absent manifest error, and Borrower, the Collateral Agent and the Lenders shall treat each Person whose name is recorded in the Register pursuant to the terms hereof as a Lender hereunder for all purposes of this Agreement. The Register shall be available for inspection by Borrower and any Lender, at any reasonable time and from time to time upon reasonable prior notice. Each Lender that sells a participation shall, acting solely for this purpose as an agent of Borrower, maintain a register on which it enters the name and address of each participant and the principal amounts (and stated interest) of each participant's interest in the Term Loans or other obligations under the Loan Documents (the "**Participant Register**"); provided that no Lender shall have any obligation to disclose all or any portion of the Participant Register (including the identity of any participant or any information relating to a participant's interest in any commitments, loans, letters of credit or its other obligations under any Loan Document) to any Person except to the extent that such disclosure is necessary to establish that such Term Loan Commitment, Term Loan or other obligation is in registered form under Section 5f.103-1(c) and proposed Section 1.163-5(b) of the United States Treasury Regulations. The entries in the Participant Register shall be conclusive absent manifest error, and such Lender shall treat each Person whose name is recorded in the Participant Register as the owner of such participation for all purposes of this Agreement notwithstanding any notice to the contrary.

12.2 Indemnification. Each Loan Party agrees to indemnify, defend and hold each Secured Party and their respective directors, officers, employees, consultants, agents, attorneys, or any other Person affiliated with or representing such Secured Party (each, an "**Indemnified Person**") harmless against: (a) all obligations, demands, claims, and liabilities (collectively, "**Claims**") asserted by any other party in connection with, related to, following, or arising from, out of or under, the transactions contemplated by the Loan Documents; and (b) all losses and Lenders' Expenses incurred, or paid by Indemnified Person in connection with, related to, following, or arising from, out of or under, the transactions contemplated by the Loan Documents (including reasonable attorneys' fees and expenses), except, in each case, for Claims and/or losses directly caused by such Indemnified Person's gross negligence or willful misconduct. Each Loan Party hereby further agrees to indemnify, defend and hold each Indemnified Person harmless from and against any and all liabilities, obligations, losses, damages, penalties, actions, judgments, suits, claims, costs, expenses and disbursements of any kind or nature whatsoever (including the fees and disbursements of counsel for such Indemnified Person) in connection with any investigative, response, remedial, administrative or judicial matter or proceeding, whether or not such Indemnified Person shall be designated a party thereto and including any such proceeding initiated by or on behalf of the Loan Parties, and the reasonable expenses of investigation by engineers, environmental consultants and similar technical personnel and any commission, fee or compensation claimed by any broker (other than any broker retained by Collateral Agent or Lenders) asserting any right to payment for the transactions contemplated hereby which may be imposed on, incurred by or asserted against such Indemnified Person as a result of or in connection with the transactions contemplated hereby and the use or intended use of the proceeds of the loan proceeds except for liabilities, obligations, losses, damages, penalties, actions, judgments, suits, claims, costs, expenses and disbursements directly caused by such Indemnified Person's gross negligence or willful misconduct. This Section 12.2 shall not apply with respect to Taxes other than any Taxes that represent losses, claims, damages, etc. arising from any non-Tax claim.

12.3 Severability of Provisions. Each provision of this Agreement is severable from every other provision in determining the enforceability of any provision.

12.4 [**Reserved**].

12.5 Amendments in Writing; Integration. (a) No amendment, modification, termination or waiver of any provision of this Agreement or any other Loan Document, no approval or consent thereunder, or any consent to any departure by any Loan Party or any of its Subsidiaries therefrom, shall in any event be effective unless the same shall be in writing and signed by the Loan Parties, Collateral Agent and the Required Lenders, provided that:

(i) no such amendment, waiver or other modification that would have the effect of increasing or reducing a Lender's Term Loan Commitment or Commitment Percentage shall be effective as to such Lender without such Lender's written consent;

(ii) no such amendment, waiver or modification that would affect the rights and duties of Collateral Agent shall be effective without Collateral Agent's written consent or signature; and

(iii) no such amendment, waiver or other modification shall, unless signed by all the Lenders directly affected thereby, (A) reduce the principal of, rate of interest on or any fees with respect to any Term Loan or forgive any principal, interest (other than default interest) or fees (other than late charges) with respect to any Term Loan; (B) postpone the date fixed for, or waive, any payment of principal of any Term Loan or of interest on any Term Loan (other than default interest) or any fees provided for hereunder (other than late charges or for any termination of any commitment); (C) change the definition of the term "Required Lenders" or the percentage of Lenders which shall be required for the Lenders to take any action hereunder; (D) release all or substantially all of any material portion of the Collateral, authorize any Loan Party to sell or otherwise dispose of all or substantially all or any material portion of the Collateral or release any Guarantor of all or any portion of the Obligations or its Guaranty obligations with respect thereto, except, in each case with respect to this clause (D), as otherwise may be expressly permitted under this Agreement or the other Loan Documents (including in connection with any disposition permitted hereunder); (E) amend, waive or otherwise modify this Section 12.5 or the definitions of the terms used in this Section 12.5 insofar as the definitions affect the substance of this Section 12.5; (F) consent to the assignment, delegation or other transfer by any Loan Party of any of its rights and obligations under any Loan Document or release any Loan Party of its payment obligations under any Loan Document, except, in each case with respect to this clause (F), pursuant to a merger or consolidation permitted pursuant to this Agreement; (G) amend any of the provisions of Section 9.4 or amend any of the definitions of Pro Rata Share, Term Loan Commitment, Commitment Percentage or that provide for the Lenders to receive their Pro Rata Shares of any fees, payments, setoffs or proceeds of Collateral hereunder; (H) subordinate the Liens granted in favor of Collateral Agent securing the Obligations; or (I) amend any of the provisions of Sections 12.7 or 12.9. It is hereby understood and agreed that all Lenders shall be deemed directly affected by an amendment, waiver or other modification of the type described in the preceding clauses (C), (D), (E), (F), (G) and (H) of the immediately preceding sentence.

(b) Other than as expressly provided for in Section 12.5(a)(i)-(iii), Collateral Agent may, at its discretion, or if requested by the Required Lenders, from time to time designate covenants in this Agreement less restrictive by notification to a representative of the Loan Parties.

(c) This Agreement and the Loan Documents represent the entire agreement about this subject matter and supersede prior negotiations or agreements with respect to such subject matter. All prior agreements, understandings, representations, warranties, and negotiations between the parties about the subject matter of this Agreement and the Loan Documents merge into this Agreement and the Loan Documents.

12.6 Counterparts. This Agreement may be executed in any number of counterparts and by different parties on separate counterparts, each of which, when executed and delivered, is an original, and all taken together, constitute one Agreement. Delivery of an executed counterpart of a signature page of this Agreement by facsimile, portable document format (.pdf) or other electronic transmission will be as effective as delivery of a manually executed counterpart hereof.

12.7 Survival. All covenants, representations and warranties made in this Agreement continue in full force and effect until this Agreement has terminated pursuant to its terms and all Obligations (other than inchoate indemnity obligations and any other obligations which, by their terms, are to survive the termination of this Agreement) have been satisfied. The obligation of the Loan Parties in Section 12.2 to indemnify each Lender and Collateral Agent, as well as the withholding provision in Section 2.5 hereof and the confidentiality provisions in Section 12.8 below, shall survive until the statute of limitations with respect to such claim or cause of action shall have run.

12.8 Confidentiality. In handling any confidential information of the Loan Parties, each of the Lenders and Collateral Agent shall exercise the same degree of care that it exercises for their own proprietary information, but disclosure of information may be made: (a) subject to the terms and conditions of this Agreement, to the Lenders' and Collateral Agent's Subsidiaries or Affiliates, or in connection with a Lender's own financing or securitization transactions and upon the occurrence of a default, event of default or similar occurrence with respect to such financing or securitization transaction; (b) to prospective transferees (other than those identified in (a) above) or purchasers of any interest in the Term Loans; (c) as required by law, rule, regulation, regulatory or self-regulatory authority, subpoena, or other order; (d) to Lenders' or Collateral Agent's regulators or as otherwise required in connection with an examination or audit; (e) as Collateral Agent reasonably considers appropriate in exercising remedies under the Loan Documents; and (f) to third party service providers of the Lenders and/or Collateral Agent so long as such service providers have executed a confidentiality agreement or have agreed to similar confidentiality terms with the Lenders and/or Collateral Agent, as applicable, with terms no less restrictive than those contained herein. Confidential information does not include information that either: (i) is in the public domain or in the Lenders' and/or Collateral Agent's possession when disclosed to the Lenders and/or Collateral Agent, or becomes part of the public domain after disclosure to the Lenders and/or Collateral Agent through no breach of this provision by the Lenders or the Collateral Agent; or (ii) is disclosed to the Lenders and/or Collateral Agent by a third party, if the Lenders and/or Collateral Agent does not know that the third party is prohibited from disclosing the information. Collateral Agent and the Lenders may use confidential information for the development of client databases, reporting purposes, and market analysis so long as Collateral Agent and the Lenders do not disclose the identity of the Borrower or any of the Borrower's Affiliates. The provisions of the immediately preceding sentence shall survive the termination of this Agreement. The agreements provided under this Section 12.8 supersede all prior agreements, understanding, representations, warranties, and negotiations between the parties about the subject matter of this Section 12.8.

12.9 Right of Set Off. Each Loan Party hereby grants to Collateral Agent and to each Lender a Lien, security interest and right of set off as security for all Obligations to Secured Parties hereunder, whether now existing or hereafter arising upon and against all deposits, credits, collateral and property, now or hereafter in the possession, custody, safekeeping or control of any Secured Party or any entity under the control of such Secured Party (including an Affiliate of Collateral Agent) or in transit to any of them. At any time after the occurrence and during the continuance of an Event of Default, without demand or notice, any Secured Party may set off the same or any part thereof and apply the same to any liability or obligation of the Loan Parties even though unmatured and regardless of the adequacy of any other collateral securing the Obligations. ANY AND ALL RIGHTS TO REQUIRE COLLATERAL AGENT TO EXERCISE ITS RIGHTS OR REMEDIES WITH RESPECT TO ANY OTHER COLLATERAL WHICH SECURES THE OBLIGATIONS, PRIOR TO EXERCISING ITS RIGHT OF SETOFF WITH RESPECT TO SUCH DEPOSITS, CREDITS OR OTHER PROPERTY OF ANY LOAN PARTY ARE HEREBY KNOWINGLY, VOLUNTARILY AND IRREVOCABLY WAIVED BY SUCH LOAN PARTY.

12.10 Cooperation of the Loan Parties. If necessary, each Loan Party agrees to (i) execute any documents reasonably required to effectuate and acknowledge each assignment of a Term Loan Commitment (or portion thereof) or Term Loan (or portion thereof) to an assignee in accordance with Section 12.1, (ii) make each Loan Party's management personnel available to meet with Collateral Agent and prospective participants and assignees of Term Loan Commitments, the Term Loans or portions thereof (which meetings shall be conducted no more often than twice every twelve months unless an Event of Default has occurred and is continuing), and (iii) assist Collateral Agent and the Lenders in the preparation of information relating to the financial affairs of each Loan Party as any prospective participant or assignee of a Term Loan Commitment (or portions thereof) or Term Loan (or portions thereof) reasonably may request. Subject to the provisions of Section 12.8, each Loan Party authorizes each Lender to disclose to any prospective participant or assignee of a Term Loan Commitment (or portions thereof), any and all information in such Lender's possession concerning each Loan Party and its financial affairs which has been delivered to such Lender by or on behalf of any Loan Party pursuant to this Agreement, or which has been delivered to such Lender by or on behalf of any Loan Party in connection with such Lender's credit evaluation of the Loan Parties prior to entering into this Agreement.

12.11 Public Announcement. Each Loan Party hereby agrees that Collateral Agent and each Lender may, after consultation with Borrower if such announcement mentions Borrower by name, make a public announcement of the transactions contemplated by this Agreement, and may publicize the same in marketing materials, newspapers and other publications, and otherwise, and in connection therewith may use any Loan Party's name, tradenames and logos. Collateral Agent and the Lenders may also make disclosures to the Securities and Exchange Commission or other governmental agency and any other public disclosure with investors, other governmental agencies or other related persons.

12.12 Collateral Agent and Lender Agreement. Collateral Agent and each Lender hereby agree to the terms and conditions set forth on Exhibit B attached hereto. Each Loan Party acknowledges and agrees to the terms and conditions set forth on Exhibit B attached hereto.

12.13 Time of Essence. Time is of the essence for the performance of Obligations under this Agreement.

12.14 Usury Savings Clause. This Agreement and the other Loan Documents are subject to the express condition that at no time shall any Loan Party be required to pay interest on the principal balance of the Term Loans at a rate which could subject Collateral Agent or any Lender to either civil or criminal liability as a result of being in excess of the Maximum Legal Rate. If by the terms of this Agreement or the other Loan Documents, any Loan Party is at any time required or obligated to pay interest on the principal balance due hereunder at a rate in excess of the Maximum Legal Rate, the Applicable Rate or the Default Rate, as the case may be, shall be deemed to be immediately reduced to the Maximum Legal Rate and all previous payments in excess of the Maximum Legal Rate shall be deemed to have been payments in reduction of principal and not on account of the interest due hereunder. All sums paid or agreed to be paid to Collateral Agent or any Lender for the use, forbearance, or detention of the sums due under the Term Loans shall, to the extent permitted by applicable law, be amortized, prorated, allocated, and spread throughout the full stated term of the Term Loans until payment in full so that the rate or amount of interest on account of the Term Loans does not exceed the Maximum Legal Rate from time to time in effect and applicable to the Term Loans for so long as the Term Loans are outstanding.

12.15 ORIGINAL ISSUE DISCOUNT LEGEND. THE TERM LOANS HAVE BEEN ISSUED WITH ORIGINAL ISSUE DISCOUNT FOR UNITED STATES FEDERAL INCOME TAX PURPOSES. THE ISSUE PRICE, AMOUNT OF ORIGINAL ISSUE DISCOUNT, ISSUE DATE AND YIELD TO MATURITY OF SUCH LOANS MAY BE OBTAINED BY WRITING TO COLLATERAL AGENT, ACTING FOR THIS PURPOSE AS A REPRESENTATIVE OF BORROWER, AT ITS ADDRESS SPECIFIED IN SECTION 10 HEREOF.

12.16 ELECTRONIC EXECUTION OF DOCUMENTS. The words “execution,” “execute”, “signed,” “signature,” and words of like import in or related to any document to be signed in connection with this Agreement and the transactions contemplated hereby shall be deemed to include electronic signatures, deliveries or the keeping of records in electronic form, each of which shall be of the same legal effect, validity or enforceability as a manually executed signature, physical delivery thereof or the use of a paper-based recordkeeping system, as the case may be, to the extent and as provided for in any applicable law, including the Federal Electronic Signatures in Global and National Commerce Act, the New York State Electronic Signatures and Records Act, or any other similar state laws based on the Uniform Electronic Transactions Act, and the parties hereto consent to conduct the transactions contemplated hereunder by electronic means.

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IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the Effective Date.

BORROWER:

RAPID MICRO BIOSYSTEMS, INC.

By: /s/ Robert Spignesi
Name: Robert Spignesi
Title: President & Chief Executive Officer

[Signature Page to Loan and Security Agreement]

COLLATERAL AGENT:

KENNEDY LEWIS MANAGEMENT LP

By: /s/ Anthony Pasqua
Name: Anthony Pasqua
Title: Authorized Signatory

LENDER:

KENNEDY LEWIS CAPITAL PARTNERS MASTER FUND II LP

By: KENNEDY LEWIS GP II, LLC, its general partner

By: /s/ Anthony Pasqua
Name: Anthony Pasqua
Title: Authorized Signatory

[Signature Page to Loan and Security Agreement]

SCHEDULE 1.1

Lenders and Commitments

Term A Loans

[Intentionally Omitted]

SCHEDULE 1.2

Terminating Collateral Account

[Intentionally Omitted]

EXHIBIT A

Description of Collateral

The Collateral consists of all of each Loan Party's right, title and interest in and to all of its personal property, wherever located, whether now owned or hereafter acquired, including the following property:

All goods, Accounts (including health care receivables), Equipment, Inventory, contract rights or rights to payment of money, leases, license agreements, franchise agreements, General Intangibles (including Intellectual Property), commercial tort claims, documents, instruments (including any promissory notes), chattel paper (whether tangible or electronic), cash, deposit accounts and other Collateral Accounts, all certificates of deposit, fixtures, letters of credit rights (whether or not the letter of credit is evidenced by a writing), securities, and all other investment property, supporting obligations, and financial assets, whether now owned or hereafter acquired, wherever located; and

All Borrower's Books relating to the foregoing, and any and all claims, rights and interests in any of the above and all substitutions for, additions, attachments, accessories, accessions and improvements to and replacements, products, proceeds and insurance proceeds of any or all of the foregoing.

Notwithstanding the foregoing, the Collateral does not include (a) rights held under a license that are not assignable by their terms without the consent of the licensor thereof (but only to the extent such restriction on assignment is effective under Section 9-406, 9-407, 9-408 or 9-409 of the Code (or any successor provision or provisions) of any relevant jurisdiction or any other applicable law (including the Bankruptcy Code) or principles of equity); (b) property owned by any Loan Party that is subject to a purchase money Lien or a capital lease permitted by Section 7.4 if the agreement pursuant to which such Lien is granted (or in the document providing for such capital lease) prohibits or requires the consent of any Person other than such Loan Party and its Affiliates which has not been obtained as a condition to the creation of any other Lien on such property; provided, however, that upon termination of such prohibition or the obtaining of such consent, such interest shall immediately become Collateral without any action by such Loan Party, Collateral Agent or any Lender; (c) any interest of any Loan Party as a lessee under an Equipment lease if such Loan Party is prohibited by the terms of such lease from granting a security interest in such lease or under which such an assignment or Lien would cause a default to occur under such lease; provided, however, that upon termination of such prohibition, such interest shall immediately become Collateral without any action by such Loan Party, Collateral Agent or any Lender; (d) more than 65% of the outstanding voting stock (or other voting equity interest) of any Foreign Subsidiary owned directly by a Loan Party; (e) any interest of Loan Party as a lessee or sublessee under a real property lease; or (f) any intent-to-use trademarks.

EXHIBIT B

Collateral Agent and Lender Terms

1. Appointment of Collateral Agent.

(a) Each Lender hereby appoints KLIM (together with any successor Collateral Agent pursuant to Section 7 of this Exhibit B) as Collateral Agent under the Loan Documents and authorizes Collateral Agent to (i) execute and deliver the Loan Documents and accept delivery thereof on its behalf from any Loan Party, (ii) take such action on its behalf and to exercise all rights, powers and remedies and perform the duties as are expressly delegated to Collateral Agent under such Loan Documents and (iii) exercise such powers as are reasonably incidental thereto.

(b) Without limiting the generality of clause (a) above, Collateral Agent shall have the sole and exclusive right and authority (to the exclusion of the Lenders), and is hereby authorized, to (i) act as the disbursing and collecting agent for the Lenders with respect to all payments and collections arising in connection with the Loan Documents (including in any other bankruptcy, insolvency or similar proceeding), and each Person making any payment in connection with any Loan Document to any Lender is hereby authorized to make such payment to Collateral Agent, (ii) file and prove claims and file other documents necessary or desirable to allow the claims of Collateral Agent and Lenders with respect to any Obligation in any bankruptcy, insolvency or similar proceeding (but not to vote, consent or otherwise act on behalf of such Lender), (iii) act as collateral agent for the Secured Parties for purposes of the perfection of all Liens created by the Loan Documents and all other purposes stated therein, (iv) manage, supervise and otherwise deal with the Collateral as permitted pursuant to the Loan Agreement, (v) take such other action as is necessary or desirable to maintain the perfection and priority of the Liens created or purported to be created by the Loan Documents, (vi) except as may be otherwise specified in any Loan Document, exercise all remedies given to Collateral Agent and the other Lenders with respect to the each Loan Party and/or the Collateral, whether under the Loan Documents, applicable Requirements of Law or otherwise and (vii) execute any amendment, consent or waiver under the Loan Documents on behalf of any Lender that has consented in writing to such amendment, consent or waiver; provided, however, that Collateral Agent hereby appoints, authorizes and directs each Lender to act as collateral sub-agent for Collateral Agent and the Lenders for purposes of the perfection of all Liens with respect to the Collateral, including any Deposit Account maintained by any Loan Party with, and cash and Cash Equivalents held by, such Lender, and may further authorize and direct the Lenders to take further actions as collateral sub-agents for purposes of enforcing such Liens or otherwise to transfer the Collateral subject thereto to Collateral Agent, and each Lender hereby agrees to take such further actions to the extent, and only to the extent, so authorized and directed. Collateral Agent may, upon any term or condition it specifies, delegate or exercise any of its rights, powers and remedies under, and delegate or perform any of its duties or any other action with respect to, any Loan Document by or through any trustee, co-agent, employee, attorney-in-fact and any other Person (including any Lender). Any such Person shall benefit from this Exhibit B to the extent provided by Collateral Agent.

(c) Under the Loan Documents, Collateral Agent (i) is acting solely on behalf of the Lenders, with duties that are entirely administrative in nature, notwithstanding the use of the defined term “Collateral Agent”, the terms “agent”, “Collateral Agent” and “collateral agent” and similar terms in any Loan Document to refer to Collateral Agent, which terms are used for title purposes only, (ii) is not assuming any obligation under any Loan Document other than as expressly set forth therein or any role as agent, fiduciary or trustee of or for any Lender or any other Person and (iii) shall have no implied functions, responsibilities, duties, obligations or other liabilities under any Loan Document, and each Lender, by accepting the benefits of the Loan Documents, hereby waives and agrees not to assert any claim against Collateral Agent based on the roles, duties and legal relationships expressly disclaimed in clauses (i) through (iii) above. Except as expressly set forth in the Loan Documents, Collateral Agent shall not have any duty to disclose, and shall not be liable for failure to disclose, any information relating to any Loan Party or any of its Subsidiaries that is communicated to or obtained by KLIM or any of its Affiliates in any capacity.

2. Binding Effect; Use of Discretion; E-Systems.

(a) Each Lender, by accepting the benefits of the Loan Documents, agrees that (i) any action taken by Collateral Agent or the Required Lenders (or, if expressly required in any Loan Document, a greater proportion of the Lenders) in accordance with the provisions of the Loan Documents, (ii) any action taken by Collateral Agent in reliance upon the instructions of the Required Lenders (or, where so required, such greater proportion) and (iii) the exercise by Collateral Agent or the Required Lenders (or, where so required, such greater proportion) of the powers set forth herein or therein, together with such other powers as are reasonably incidental thereto, shall be authorized and binding upon all of Lenders.

(b) If Collateral Agent shall request instructions from the Required Lenders or all affected Lenders with respect to any act or action (including failure to act) in connection with any Loan Document, then Collateral Agent shall be entitled to refrain from such act or taking such action unless and until Collateral Agent shall have received instructions from the Required Lenders or all affected Lenders, as the case may be, and Collateral Agent shall not incur liability to any Person by reason of so refraining. Collateral Agent shall be fully justified in failing or refusing to take any action under any Loan Document (i) if such action would, in the opinion of Collateral Agent, be contrary to any Requirement of Law or any Loan Document, (ii) if such action would, in the opinion of Collateral Agent, expose Collateral Agent to any potential liability under any Requirement of Law or (iii) if Collateral Agent shall not first be indemnified to its satisfaction against any and all liability and expense which may be incurred by it by reason of taking or continuing to take any such action. Without limiting the foregoing, no Lender shall have any right of action whatsoever against Collateral Agent as a result of Collateral Agent acting or refraining from acting under any Loan Document in accordance with the instructions of the Required Lenders or all affected Lenders, as applicable.

(c) Collateral Agent is hereby authorized by each Loan Party and each Lender to establish procedures (and to amend such procedures from time to time) to facilitate administration and servicing of the Term Loans and other matters incidental thereto. Without limiting the generality of the foregoing, Collateral Agent is hereby authorized to establish procedures to make available or deliver, or to accept, notices, documents (including, without limitation, borrowing base certificates) and similar items on, by posting to or submitting and/or completion, on E-Systems. Each Loan Party and each Lender acknowledges and agrees that the use of transmissions via an E-System or electronic mail is not necessarily secure and that there are risks associated with such use, including risks of interception, disclosure and abuse, and each Loan Party and each Lender assumes and accepts such risks by hereby authorizing the transmission via E-Systems or electronic mail. Each “e signature” on any such posting shall be deemed sufficient to satisfy any requirement for a “signature”, and each such posting shall be deemed sufficient to satisfy any requirement for a “writing”, in each case including pursuant to any Loan Document, any applicable provision of any Code, the federal Uniform Electronic Transactions Act, the Electronic Signatures in Global and National Commerce Act and any substantive or procedural Requirement of Law governing such subject matter. All uses of an E-System shall be governed by and subject to, in addition to this Section, the separate terms, conditions and privacy policy posted or referenced in such E-System (or such terms, conditions and privacy policy as may be updated from time to time, including on such E-System) and related contractual obligations executed by Collateral Agent, any Loan Party and/or Lenders in connection with the use of such E-System. ALL E-SYSTEMS AND ELECTRONIC TRANSMISSIONS SHALL BE PROVIDED “AS IS” AND “AS AVAILABLE”. NO REPRESENTATION OR WARRANTY OF ANY KIND IS MADE BY AGENT, ANY LENDER OR ANY OF THEIR RELATED PERSONS IN CONNECTION WITH ANY E SYSTEMS.

3. Collateral Agent's Reliance, Etc. Collateral Agent may, without incurring any liability hereunder, (a) consult with any of its Related Persons and, whether or not selected by it, any other advisors, accountants and other experts (including advisors to, and accountants and experts engaged by, any Loan Party) and (b) rely and act upon any document and information (including those transmitted by electronic transmission) and any telephone message or conversation, in each case believed by it to be genuine and transmitted, signed or otherwise authenticated by the appropriate parties. None of Collateral Agent and its Related Persons shall be liable for any action taken or omitted to be taken by any of them under or in connection with any Loan Document, and each Lender and each Loan Party hereby waives and shall not assert (and each Loan Party shall cause its Subsidiaries to waive and agree not to assert) any right, claim or cause of action based thereon, except to the extent of liabilities resulting from the gross negligence or willful misconduct of Collateral Agent or, as the case may be, such Related Person (each as determined in a final, non-appealable judgment of a court of competent jurisdiction) in connection with the duties of Collateral Agent expressly set forth herein. Without limiting the foregoing, Collateral Agent: (i) shall not be responsible or otherwise incur liability for any action or omission taken in reliance upon the instructions of the Required Lenders or for the actions or omissions of any of its Related Persons, except to the extent that a court of competent jurisdiction determines in a final non-appealable judgment that Collateral Agent acted with gross negligence or willful misconduct in the selection of such Related Person; (ii) shall not be responsible to any Lender or other Person for the due execution, legality, validity, enforceability, effectiveness, genuineness, sufficiency or value of, or the attachment, perfection or priority of any Lien created or purported to be created under or in connection with, any Loan Document; (iii) makes no warranty or representation, and shall not be responsible, to any Lender or other Person for any statement, document, information, representation or warranty made or furnished by or on behalf of any Loan Party or any Related Person of any Loan Party in connection with any Loan Document or any transaction contemplated therein or any other document or information with respect to any Loan Party, whether or not transmitted or (except for documents expressly required under any Loan Document to be transmitted to the Lenders) omitted to be transmitted by Collateral Agent, including as to completeness, accuracy, scope or adequacy thereof, or for the scope, nature or results of any due diligence performed by Collateral Agent in connection with the Loan Documents; and (iv) shall not have any duty to ascertain or to inquire as to the performance or observance of any provision of any Loan Document, whether any condition set forth in any Loan Document is satisfied or waived, as to the financial condition of any Loan Party or as to the existence or continuation or possible occurrence or continuation of any Event of Default, and shall not be deemed to have notice or knowledge of such occurrence or continuation unless it has received a notice from any Loan Party or any Lender describing such Event of Default that is clearly labeled "notice of default" (in which case Collateral Agent shall promptly give notice of such receipt to all Lenders, provided that Collateral Agent shall not be liable to any Lender for any failure to do so, except to the extent that such failure is attributable to Collateral Agent's gross negligence or willful misconduct as determined by a final non-appealable judgment of a court of competent jurisdiction); and, for each of the items set forth in clauses (i) through (iv) above, each Lender and any Loan Party hereby waives and agrees not to assert (and any Loan Party shall cause its Subsidiaries to waive and agree not to assert) any right, claim or cause of action it might have against Collateral Agent based thereon.

4. Collateral Agent Individually. Collateral Agent and its Affiliates may make loans and other extensions of credit to, acquire stock and stock equivalents of, engage in any kind of business with, any Loan Party or any Affiliate of any Loan Party as though it were not acting as Collateral Agent and may receive separate fees and other payments therefor. To the extent Collateral Agent or any of its Affiliates makes any Term Loans or otherwise becomes a Lender hereunder, it shall have and may exercise the same rights and powers hereunder and shall be subject to the same obligations and liabilities as any other Lender and the terms "Lender", "Required Lender" and any similar terms shall, except where otherwise expressly provided in any Loan Document, include, without limitation, Collateral Agent or such Affiliate, as the case may be, in its individual capacity as Lender, or as one of the Required Lenders.

5. Lender Credit Decision; Collateral Agent Report. Each Lender acknowledges that it shall, independently and without reliance upon Collateral Agent, any Lender or any of their Related Persons or upon any document solely or in part because such document was transmitted by Collateral Agent or any of its Related Persons, conduct its own independent investigation of the financial condition and affairs of any Loan Party and make and continue to make its own credit decisions in connection with entering into, and taking or not taking any action under, any Loan Document or with respect to any transaction contemplated in any Loan Document, in each case based on such documents and information as it shall deem appropriate. Except for documents expressly required by any Loan Document to be transmitted by Collateral Agent to the Lenders, Collateral Agent shall not have any duty or responsibility to provide any Lender with any credit or other information concerning the business, prospects, operations, Property, financial and other condition or creditworthiness of any Loan Party or any Affiliate of any Loan Party that may come in to the possession of Collateral Agent or any of its Related Persons. Each Lender agrees that it shall not rely on any field examination, audit or other report provided by Collateral Agent or its Related Persons (an "**Collateral Agent Report**"). Each Lender further acknowledges that any Collateral Agent Report (a) is provided to the Lenders solely as a courtesy, without consideration, and based upon the understanding that such Lender will not rely on such Collateral Agent Report, (b) was prepared by Collateral Agent or its Related Persons based upon information provided by any Loan Party solely for Collateral Agent's own internal use, and (c) may not be complete and may not reflect all information and findings obtained by Collateral Agent or its Related Persons regarding the operations and condition of any Loan Party. Neither Collateral Agent nor any of its Related Persons makes any representations or warranties of any kind with respect to (i) any existing or proposed financing, (ii) the accuracy or completeness of the information contained in any Collateral Agent Report or in any related documentation, (iii) the scope or adequacy of Collateral Agent's and its Related Persons' due diligence, or the presence or absence of any errors or omissions contained in any Collateral Agent Report or in any related documentation, and (iv) any work performed by Collateral Agent or Collateral Agent's Related Persons in connection with or using any Collateral Agent Report or any related documentation. Neither Collateral Agent nor any of its Related Persons shall have any duties or obligations in connection with or as a result of any Lender receiving a copy of any Collateral Agent Report. Without limiting the generality of the foregoing, neither Collateral Agent nor any of its Related Persons shall have any responsibility for the accuracy or completeness of any Collateral Agent Report, or the appropriateness of any Collateral Agent Report for any Lender's purposes, and shall have no duty or responsibility to correct or update any Collateral Agent Report or disclose to any Lender any other information not embodied in any Collateral Agent Report, including any supplemental information obtained after the date of any Collateral Agent Report. Each Lender releases, and agrees that it will not assert, any claim against Collateral Agent or its Related Persons that in any way relates to any Collateral Agent Report or arises out of any Lender having access to any Collateral Agent Report or any discussion of its contents, and agrees to indemnify and hold harmless Collateral Agent and its Related Persons from all claims, liabilities and expenses relating to a breach by any Lender arising out of such Lender's access to any Collateral Agent Report or any discussion of its contents.

6. Indemnification. Each Lender agrees to reimburse Collateral Agent and each of its Related Persons (to the extent not reimbursed by any Loan Party as required under the Loan Documents (including pursuant to Section 12.2 of the Agreement)) promptly upon demand for its Pro Rata Share of any out-of-pocket costs and expenses (including, without limitation, fees, charges and disbursements of financial, legal and other advisors and any Taxes or insurance paid in the name of, or on behalf of, any Loan Party) incurred by Collateral Agent or any of its Related Persons in connection with the preparation, syndication, execution, delivery, administration, modification, amendment, consent, waiver or enforcement of, or the taking of any other action (whether through negotiations, through any work-out, bankruptcy, restructuring or other legal or other proceeding (including, without limitation, preparation for and/or response to any subpoena or request for document production relating thereto) or otherwise) in respect of, or legal advice with respect to, its rights or responsibilities under, any Loan Document. Each Lender further agrees to indemnify Collateral Agent and each of its Related Persons (to the extent not reimbursed by any Loan Party as required under the Loan Documents (including pursuant to Section 12.2 of the Agreement)), ratably according to its Pro Rata Share, from and against any and all liabilities, obligations, losses, damages, penalties, actions, judgments, suits, costs, expenses or disbursements of any kind or nature whatsoever (including, to the extent not indemnified by the applicable Loan Party, Taxes, interests and penalties imposed for not properly withholding or backup withholding on payments made to or for the account of any Lender) that may be imposed on, incurred by, or asserted against Collateral Agent or any of its Related Persons in any matter relating to or arising out of, in connection with or as a result of any Loan Document or any other act, event or transaction related, contemplated in or attendant to any such document, or, in each case, any action taken or omitted to be taken by Collateral Agent or any of its Related Persons under or with respect to the foregoing; provided that no Lender shall be liable to Collateral Agent or any of its Related Persons under this Section 6 of this Exhibit B to the extent such liability has resulted from the gross negligence or willful misconduct of Collateral Agent or, as the case may be, such Related Person, as determined by a final non-appealable judgment of a court of competent jurisdiction. To the extent required by any applicable Requirement of Law, Collateral Agent may withhold from any payment to any Lender under a Loan Document an amount equal to any applicable withholding Tax. If the Internal Revenue Service or any other Governmental Authority asserts a claim that Collateral Agent did not properly withhold Tax from amounts paid to or for the account of any Lender for any reason, or if Collateral Agent reasonably determines that it was required to withhold Taxes from a prior payment to or for the account of any Lender but failed to do so, such Lender shall promptly indemnify Collateral Agent fully for all amounts paid, directly or indirectly, by Collateral Agent as Tax or otherwise, including penalties and interest, and together with all expenses incurred by Collateral Agent. Collateral Agent may offset against any payment to any Lender under a Loan Document, any applicable withholding Tax that was required to be withheld from any prior payment to such Lender but which was not so withheld, as well as any other amounts for which Collateral Agent is entitled to indemnification from such Lender under the immediately preceding sentence of this Section 6 of this Exhibit B.

7. Successor Collateral Agent. Collateral Agent may resign at any time by delivering notice of such resignation to the Lenders and the Loan Parties, effective on the date set forth in such notice or, if no such date is set forth therein, upon the date such notice shall be effective, in accordance with the terms of this Section 7 of this Exhibit B. If Collateral Agent delivers any such notice, the Required Lenders shall have the right to appoint a successor Collateral Agent. If, after 30 days after the date of the retiring Collateral Agent's notice of resignation, no successor Collateral Agent has been appointed by the Required Lenders and has accepted such appointment, then the retiring Collateral Agent may, on behalf of the Lenders, appoint a successor Collateral Agent from among the Lenders. Effective immediately upon its resignation, (a) the retiring Collateral Agent shall be discharged from its duties and obligations under the Loan Documents, (b) the Lenders shall assume and perform all of the duties of Collateral Agent until a successor Collateral Agent shall have accepted a valid appointment hereunder, (c) the retiring Collateral Agent and its Related Persons shall no longer have the benefit of any provision of any Loan Document other than with respect to any actions taken or omitted to be taken while such retiring Collateral Agent was, or because such Collateral Agent had been, validly acting as Collateral Agent under the Loan Documents, and (d) subject to its rights under Section 2(b) of this Exhibit B, the retiring Collateral Agent shall take such action as may be reasonably necessary to assign to the successor Collateral Agent its rights as Collateral Agent under the Loan Documents. Effective immediately upon its acceptance of a valid appointment as Collateral Agent, a successor Collateral Agent shall succeed to, and become vested with, all the rights, powers, privileges and duties of the retiring Collateral Agent under the Loan Documents.

8. Release of Collateral. Each Lender hereby consents to the release and hereby directs Collateral Agent to release (or in the case of clause (b) (ii) below, release or subordinate) the following:

(a) any Guarantor if all of the stock of such Subsidiary owned by any Loan Party is sold or transferred in a transaction permitted under the Loan Documents (including pursuant to a valid waiver or consent), to the extent that, after giving effect to such transaction, such Subsidiary would not be required to guaranty any Obligations pursuant to any Loan Document; and

(b) any Lien held by Collateral Agent for the benefit of the Secured Parties against (i) any Collateral that is sold or otherwise disposed of by any Loan Party in a transaction permitted by the Loan Documents (including pursuant to a valid waiver or consent), (ii) any Collateral subject to a Lien that is expressly permitted under clause (c) of the definition of the term "Permitted Lien" and (iii) all of the Collateral and any Loan Party, upon (A) termination of all of the Commitments, (B) the payment in full in cash of all of the Obligations (other than inchoate indemnity obligations for which no claim has been made), and (C) to the extent requested by Collateral Agent, receipt by Collateral Agent and Lenders of liability releases from any Loan Party in form and substance acceptable to Collateral Agent.

9. Setoff and Sharing of Payments. In addition to any rights now or hereafter granted under any applicable Requirement of Law and not by way of limitation of any such rights, upon the occurrence and during the continuance of any Event of Default and subject to Section 10(d) of this Exhibit B, each Lender is hereby authorized at any time or from time to time upon the direction of Collateral Agent, without notice to any Loan Party or any other Person, any such notice being hereby expressly waived, to setoff and to appropriate and to apply any and all balances held by it at any of its offices for the account of Borrower (regardless of whether such balances are then due to any Loan Party) and any other properties or assets at any time held or owing by that Lender or that holder to or for the credit or for the account of any Loan Party against and on account of any of the Obligations that are not paid when due. Any Lender exercising a right of setoff or otherwise receiving any payment on account of the Obligations in excess of its Pro Rata Share thereof shall purchase for cash (and the other Lenders or holders shall sell) such participations in each such other Lender's or holder's Pro Rata Share of the Obligations as would be necessary to cause such Lender to share the amount so offset or otherwise received with each other Lender or holder in accordance with their respective Pro Rata Shares of the Obligations. Each Loan Party agrees, to the fullest extent permitted by law, that (a) any Lender may exercise its right to offset with respect to amounts in excess of its Pro Rata Share of the Obligations and may purchase participations in accordance with the preceding sentence and (b) any Lender so purchasing a participation in the Term Loans made or other Obligations held by other Lenders or holders may exercise all rights of offset, bankers' liens, counterclaims or similar rights with respect to such participation as fully as if such Lender or holder were a direct holder of the Term Loans and the other Obligations in the amount of such participation. Notwithstanding the foregoing, if all or any portion of the offset amount or payment otherwise received is thereafter recovered from the Lender that has exercised the right of offset, the purchase of participations by that Lender shall be rescinded and the purchase price restored without interest.

10. Advances; Payments; Non-Funding Lenders; Actions in Concert.

(a) Advances; Payments. If Collateral Agent receives any payment with respect to a Term Loan for the account of the Lenders on or prior to 2:00 p.m. (New York time) on any Business Day, Collateral Agent shall pay to each applicable Lender such Lender's Pro Rata Share of such payment on such Business Day. If Collateral Agent receives any payment with respect to a Term Loan for the account of Lenders after 2:00 p.m. (New York time) on any Business Day, Collateral Agent shall pay to each applicable Lender such Lender's Pro Rata Share of such payment on the next Business Day.

(b) Return of Payments.

(i) If Collateral Agent pays an amount to a Lender under this Agreement in the belief or expectation that a related payment has been or will be received by Collateral Agent or on behalf of from any Loan Party and such related payment is not received by Collateral Agent, then Collateral Agent will be entitled to recover such amount (including interest accruing on such amount at the rate otherwise applicable to such Obligation) from such Lender on demand without setoff, counterclaim or deduction of any kind.

(ii) If Collateral Agent determines at any time that any amount received by Collateral Agent under any Loan Document must be returned to any Loan Party or paid to any other Person pursuant to any insolvency law or otherwise, then, notwithstanding any other term or condition of any Loan Document, Collateral Agent will not be required to distribute any portion thereof to any Lender. In addition, each Lender will repay to Collateral Agent on demand any portion of such amount that Collateral Agent has distributed to such Lender, together with interest at such rate, if any, as Collateral Agent is required to pay to any Loan Party or such other Person, without setoff, counterclaim or deduction of any kind and Collateral Agent will be entitled to set off against future distributions to such Lender any such amounts (with interest) that are not repaid on demand.

(c) Non-Funding Lenders.

(i) Unless Collateral Agent shall have received notice from a Lender prior to the date of any Term Loan that such Lender will not make available to Collateral Agent such Lender's Pro Rata Share of such Term Loan, Collateral Agent may assume that such Lender will make such amount available to it on the date of such Term Loan in accordance with Section 2(b) of this Exhibit B, and Collateral Agent may (but shall not be obligated to), in reliance upon such assumption, make available a corresponding amount for the account of Borrower on such date. If and to the extent that such Lender shall not have made such amount available to Collateral Agent, such Lender and each Loan Party severally agree to repay to Collateral Agent forthwith on demand such corresponding amount together with interest thereon, for each day from the day such amount is made available to any Loan Party until the day such amount is repaid to Collateral Agent, at a rate per annum equal to the interest rate applicable to the Obligation that would have been created when Collateral Agent made available such amount to any Loan Party had such Lender made a corresponding payment available. If such Lender shall repay such corresponding amount to Collateral Agent, the amount so repaid shall constitute such Lender's portion of such Term Loan for purposes of this Agreement.

(ii) To the extent that any Lender has failed to fund any Term Loan or any other payments required to be made by it under the Loan Documents after any such Term Loan is required to be made or such payment is due (a "**Non-Funding Lender**"), Collateral Agent shall be entitled to set off the funding short-fall against that Non-Funding Lender's Pro Rata Share of all payments received from or on behalf of Borrower thereunder. The failure of any Non Funding Lender to make any Term Loan or any payment required by it hereunder shall not relieve any other Lender (each such other Lender, an "**Other Lender**") of its obligations to make such Term Loan, but neither any Other Lender nor Collateral Agent shall be responsible for the failure of any Non-Funding Lender to make such Term Loan or make any other payment required hereunder. Notwithstanding anything set forth herein to the contrary, a Non-Funding Lender shall not have any voting or consent rights under or with respect to any Loan Document or constitute a "Lender" (or be included in the calculation of "Required Lenders" hereunder) for any voting or consent rights under or with respect to any Loan Document. At Borrower's request, Collateral Agent or a Person reasonably acceptable to Collateral Agent shall have the right with Collateral Agent's consent and in Collateral Agent's sole discretion (but Collateral Agent or any such Person shall have no obligation) to purchase from any Non-Funding Lender, and each Lender agrees that if it becomes a Non-Funding Lender it shall, at Collateral Agent's request, sell and assign to Collateral Agent or such Person, all of the Term Loan Commitment (if any), and all of the outstanding Term Loan of that Non-Funding Lender for an amount equal to the aggregate outstanding principal balance of the Term Loan held by such Non-Funding Lender and all accrued interest with respect thereto through the date of sale, such purchase and sale to be consummated pursuant to an executed assignment agreement in form and substance reasonably satisfactory to, and acknowledged by, Collateral Agent.

(d) Actions in Concert. Anything in this Agreement to the contrary notwithstanding, each Lender hereby agrees with each other Lender that no Lender shall take any action to protect or enforce its rights arising out of any Loan Document (including exercising any rights of setoff) without first obtaining the prior written consent of Collateral Agent or Required Lenders, it being the intent of Lenders that any such action to protect or enforce rights under any Loan Document shall be taken in concert and at the direction or with the consent of Collateral Agent or Required Lenders.

EXHIBIT C

Taxes; Increased Costs.

1. Any and all payments received by Collateral Agent or the Lenders from any Loan Party hereunder will be made free and clear of and without deduction or withholding for any present or future taxes, levies, imposts, duties, deductions, withholdings (including backup withholding), assessments, fees or other charges imposed by any Governmental Authority (including any interest, additions to tax or penalties applicable thereto) ("**Taxes**") except as required by applicable law. "**Indemnified Taxes**" means (a) to the extent not otherwise described in (b), Other Taxes and (b) Taxes imposed on or with respect to any payment made by or on account of any obligation of any Loan Party under any Loan Document (other than the Warrants), excluding (i) Taxes imposed on or measured by any Lender's or Collateral Agent's net income (however denominated), franchise Taxes and branch profits Taxes or any similar Tax, in each case (A) imposed as a result of such Lender or Collateral Agent being organized under the laws of, or having its principal office or its applicable lending office located in the jurisdiction imposing such Tax (or any political subdivision thereof) or (B) that are Taxes imposed as a result of a present or former connection between such Lender or Collateral Agent and the jurisdiction imposing such Tax (other than connections arising from such Lender or Collateral Agent having executed, delivered, become a party to, performed its obligations under, received payments under, received or perfected a security interest under, engaged in any other transaction pursuant to or enforced any Loan Document, or sold or assigned an interest in any Term Loan or Loan Document) (such Taxes in (i)(B) "**Other Connection Taxes**"), (ii) in the case of any Lender, U.S. federal withholding Tax that is imposed on amounts payable to such Lender at the time such Lender becomes a party to this Agreement or acquires an interest in a Term Loan or changes its lending office, except in each case to the extent that, pursuant to this Exhibit C, amounts with respect to such Taxes were payable either to such Lender's assignor immediately before such Lender became a party hereto or to such Lender immediately before it changed its lending office, (iii) Taxes imposed under FATCA, and (iv) Taxes attributable to a Lender's or Collateral Agent's failure to comply with Section (5) of this Exhibit C (such excluded Taxes described in clauses (i) through (iv) "**Excluded Taxes**"). If any applicable law, requires any Loan Party or, if applicable, Collateral Agent to make any withholding or deduction in respect of Indemnified Taxes from any such payment, each Loan Party hereby covenants and agrees that the amount due from such Loan Party with respect to such payment will be increased to the extent necessary to ensure that, after the making of such required withholding or deduction (and including any such withholdings and deductions applicable to additional sums payable under this Section), Collateral Agent or each Lender, as applicable, receives a net sum equal to the sum which it would have received had no withholding or deduction been required. Each Loan Party or, if applicable, Collateral Agent shall pay the full amount required to be withheld or deducted in respect of any Taxes to the relevant Governmental Authority. Each Loan Party shall timely pay to the relevant Governmental Authority in accordance with applicable law, or at the option of Collateral Agent timely reimburse it for the payment of, any Other Taxes. Each Loan Party will, as soon as practicable after any payment of Taxes pursuant to this Exhibit C, furnish Collateral Agent the original or a certified copy of a receipt issued by such Governmental Authority evidencing such payment, a copy of the return reporting such payment or other evidence reasonably satisfactory to Collateral Agent indicating that such Loan Party has made such withholding payment.

2. Each Loan Party shall jointly and severally indemnify Collateral Agent and each Lender, within 10 days after written demand therefor, for the full amount of any Indemnified Taxes (including Indemnified Taxes imposed or asserted on or attributable to amounts payable under this Exhibit C) payable or paid by Collateral Agent or such Lender or required to be withheld or deducted from a payment to Collateral Agent or such Lender and any reasonable expenses arising therefrom or with respect thereto, whether or not such Taxes were correctly or legally imposed or asserted by the relevant Governmental Authority. A certificate as to the amount of such payment or liability delivered to any Loan Party by a Lender (with a copy to Collateral Agent), or by Collateral Agent on its own behalf or on behalf of a Lender, shall be conclusive absent manifest error.

3. If any change in applicable law shall subject Collateral Agent or any Lender to any Taxes (other than (a) Indemnified Taxes, (b) Taxes described in clauses (ii) through (iv) of the definition of Excluded Taxes and (c) Other Connection Taxes that are imposed on or measured by net income (however denominated) or that are franchise Taxes or branch profits Taxes) on its loans, loan principal, letters of credit, commitments, or other Obligations, or its deposits, reserves, other liabilities or capital attributable thereto, and the result shall be to increase the cost to such Lender or Collateral Agent of making, converting to, continuing or maintaining any loan, or to increase the cost to such Lender or Collateral Agent of participating in, issuing or maintaining any letter of credit (or maintaining its obligation to participate in or to issue any letter of credit), or to reduce the amount of any sum received or receivable by such Lender or Collateral Agent (whether principal, interest or any other amount), then, upon the request of such Lender or Collateral Agent, such Loan Party will promptly pay to such Lender or Collateral Agent such additional amount or amounts as will compensate such Lender or Collateral Agent for such additional costs incurred or reduction suffered; provided that no Loan Party shall be required to compensate a Lender pursuant to this Section 3 of Exhibit C for any increased costs incurred or reductions suffered more than nine months prior to the date that such Lender notifies Borrower of the change in applicable law giving rise to such increased costs or reductions, and of such Lender's intention to claim compensation therefor (except that, if the change in applicable law giving rise to such increased costs or reductions is retroactive, then the nine-month period referred to above shall be extended to include the period of retroactive effect thereof).

4. Each Lender shall severally indemnify Collateral Agent, within 10 days after demand therefor, for (i) any Indemnified Taxes attributable to such Lender (but only to the extent that any Loan Party has not already indemnified Collateral Agent for such Indemnified Taxes and without limiting the obligations of any Loan Party to do so) and (ii) any Excluded Taxes attributable to such Lender, in each case, that are payable or paid by Collateral Agent in connection with any Loan Document, and any reasonable expenses arising therefrom or with respect thereto, whether or not such Taxes were correctly or legally imposed or asserted by the relevant Governmental Authority. A certificate as to the amount of such payment or liability delivered to any Lender by Collateral Agent shall be conclusive absent manifest error. Each Lender hereby authorizes Collateral Agent to set off and apply any and all amounts at any time owing to such Lender under any Loan Document or otherwise payable by Collateral Agent to the Lender from any other source against any amount due to Collateral Agent under this Section 4 of Exhibit C.

5. Any Lender that is entitled to an exemption from or reduction of withholding Tax with respect to payments made under any Loan Document shall deliver to Borrower and Collateral Agent, at the time or times reasonably requested by Borrower or Collateral Agent, such properly completed and executed documentation reasonably requested by Borrower or Collateral Agent as will permit such payments to be made without withholding or at a reduced rate of withholding. In addition, any Lender, if reasonably requested by Borrower or Collateral Agent, shall deliver such other documentation prescribed by applicable law or reasonably requested by Borrower or Collateral Agent as will enable Borrower or Collateral Agent to determine whether or not such Lender is subject to backup withholding or information reporting requirements. Notwithstanding anything to the contrary in the preceding two sentences, the completion, execution and submission of such documentation (other than an Internal Revenue Service Form W-9 or applicable Internal Revenue Service Form W-8, as applicable) shall not be required if in the Lender's reasonable judgment such completion, execution or submission would subject such Lender to any material unreimbursed cost or expense or would materially prejudice the legal or commercial position of such Lender. Without limiting the foregoing, (i) any Lender that is a U.S. Person shall deliver to Borrower and Collateral Agent on or prior to the date on which such Lender becomes a Lender under this Agreement executed copies of Internal Revenue Service Form W-9 certifying that such Lender is exempt from U.S. federal backup withholding tax and (ii) any Lender that is not a U.S. Person shall deliver to Borrower and Collateral Agent, on or prior to the date on which such Lender becomes a Lender under this agreement, the appropriate Internal Revenue Service Form W-8 together with any required supporting or additional information and (iii) any Lender that is claiming the benefits of the exemption for portfolio interest under Section 881(c) of the Internal Revenue Code shall deliver to Borrower and Collateral Agent, on or prior to the date on which such Lender becomes a Lender under this agreement, (x) a certificate in form and substance reasonably acceptable to Borrower and Collateral Agent to the effect that such Lender is not a "bank" within the meaning of Section 881(c)(3)(A) of the Internal Revenue Code, a "10 percent shareholder" of Borrower within the meaning of Section 881(c)(3)(B) of the Internal Revenue Code, or a "controlled foreign corporation" related to Borrower as described in Section 881(c)(3)(C) of the Internal Revenue Code and (y) executed copies of Internal Revenue Service Form W-8BEN or Internal Revenue Service Form W-8BEN-E, as applicable. Each Lender agrees that if any form or certification it previously delivered expires or becomes obsolete or inaccurate in any respect, it shall update such form or certification or promptly notify Borrower and Collateral Agent in writing of its legal inability to do so. For purposes of this Section 5 of Exhibit C, the term Lender includes the Collateral Agent and any Person who becomes a participant pursuant to Section 12.1 shall deliver to the participating Lender the forms required in this Section 5.

6. Treatment of Certain Refunds. If any party determines, in its sole discretion exercised in good faith, that it has received a refund of any Taxes as to which it has been indemnified pursuant to this Exhibit C (including by the payment of additional amounts pursuant to this Exhibit C), it shall pay to the indemnifying party an amount equal to such refund (but only to the extent of indemnity payments made, or additional amounts paid, under this Exhibit C with respect to the Taxes giving rise to such refund), net of all out-of-pocket expenses (including Taxes) of such indemnified party and without interest (other than any interest paid by the relevant Governmental Authority with respect to such refund). Such indemnifying party, upon the request of such indemnified party, shall repay to such indemnified party the amount paid over pursuant to this Section 6 (plus any penalties, interest or other charges imposed by the relevant Governmental Authority) if such indemnified party is required to repay such refund to such Governmental Authority. Notwithstanding anything to the contrary in this Section 6, in no event will the indemnified party be required to pay any amount to an indemnifying party pursuant to this Section 6 the payment of which would place the indemnified party in a less favorable net after-Tax position than the indemnified party would have been in if the Tax subject to indemnification and giving rise to such refund had not been deducted, withheld or otherwise imposed and the indemnification payments or additional amounts with respect to such Tax had never been paid. This Section 6 shall not be construed to require any indemnified party to make available its Tax returns (or any other information relating to its Taxes that it deems confidential) to the indemnifying party or any other Person.

7. The agreements and obligations contained in this Exhibit C shall survive the resignation or replacement of Collateral Agent, any assignment of rights by, or the replacement of, a Lender and the termination of this Agreement.

EXHIBIT D

Loan Payment Request Form

[Intentionally Omitted]

EXHIBIT E

Compliance Certificate

[Intentionally Omitted]

EXHIBIT F

Perfection Certificate

[Intentionally Omitted]

EXHIBIT G

Form of Warrant

[Intentionally Omitted]

EXHIBIT H

Illustrative Measurement of System Orders

[Intentionally Omitted]

Exhibit 21.1

Subsidiaries of Rapid Micro Biosystems, Inc.

Legal Name of Subsidiary	Jurisdiction of Organization
Rapid Micro Biosystems Europe GmbH	Germany
Rapid Micro Biosystems Services Switzerland LLC	Switzerland

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the use in this Registration Statement on Form S-1 of Rapid Micro Biosystems, Inc. of our report dated March 22, 2021, except for the effects of the revision discussed in Note 1 to the consolidated financial statements, as to which the date is May 6, 2021, relating to the financial statements of Rapid Micro Biosystems, Inc., which appears in this Registration Statement. We also consent to the reference to us under the heading “Experts” in such Registration Statement.

/s/ PricewaterhouseCoopers LLP
Boston, Massachusetts
June 25, 2021

Exhibit 23.3

Consent of Health Advances LLC ("Health Advances")

Health Advances LLC ("Health Advances") hereby consents to the references to Health Advances' name in the Registration Statement on Form S-1 (as may be amended or supplemented) of Rapid Micro Biosystems, Inc. (the "Company") filed with the U.S. Securities and Exchange Commission (the "Registration Statement") and the quotation by the Company in the Registration Statement of research and market data from Health Advances' report prepared on behalf of the Company. Health Advances also hereby consents to the filing of this letter as an exhibit to the Registration Statement.

Dated: June 25, 2021

Health Advances LLC

By: /s/ Donna Hochberg
Name: Donna Hochberg
Title: Partner

Address: 275 Grove Street, Suite 1-300
Newton, MA 02466