UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, DC 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2021

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to

Commission File Number: 001-37465

Seres Therapeutics, Inc.

(Exact Name of Registrant as Specified in Its Charter)

Delaware	**27-4326290**
(State or Other Jurisdiction of Incorporation or Organization)	**(IRS Employer Identification No.)**
200 Sidney Street – 4th Floor Cambridge, Massachusetts	**02139**
(Address of Principal Executive Offices)	**(Zip Code)**

(617) 945-9626

(Registrant's Telephone Number, Including Area Code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	**Trading Symbol(s)**	**Name of each exchange on which registered**
Common stock, par value $0.001 per share	MCRB	The Nasdaq Global Select Market

Securities Registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. **Yes** ☐ **No** ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. **Yes** ☐ **No** ☒

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. **Yes** ☒ **No** ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). **Yes** ☒ **No** ☐

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 the "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 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). **Yes** ☐ **No** ☒

The aggregate market value of the voting and non-voting common stock held by non-affiliates of the registrant based on the closing price of the registrant's common stock as reported on the Nasdaq Global Select Market on June 30, 2021, was $1,645,330,768. Solely for purposes of this disclosure, shares of common stock held by executive officers, directors and certain stockholders of the registrant as of such date have been excluded because such holders may be deemed to be affiliates.

As of February 24, 2022, there were 92,014,368 shares of the registrant's common stock, par value $0.001 per share, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement relating to its 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year ended December 31, 2021 are incorporated herein by reference in Part III.

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FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements. We intend such forward-looking statements to be covered by the safe harbor provisions for forward-looking statements contained in Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. All statements other than statements of historical facts contained in this Annual Report on Form 10-K, including without limitation statements regarding our future results of operations and financial position, business strategy, prospective products, product approvals, research and development costs, timing and likelihood of success, manufacturing activities and related timing, commercialization efforts, plans and objectives of management for future operations and future results of anticipated products, 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” or “continue” or the negative of these terms or other similar expressions. The forward-looking statements in this Annual Report on Form 10-K are only predictions. We have based these forward-looking statements 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 report and are subject to a number of important factors that could cause actual results to differ materially from those in the forward-looking statements, including the risks, uncertainties and assumptions described under the sections in this report titled “Summary Risk Factors,” “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and elsewhere in this Annual Report on Form 10-K.

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.

You should read this Annual Report on Form 10-K and the documents that we reference in this Annual Report on Form 10-K completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of our forward-looking statements by these cautionary statements. 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.

TRADEMARKS, SERVICE MARKS AND TRADENAMES

We have proprietary rights to trademarks used in this Annual Report on Form 10-K, which are important to our business and many of which are registered under applicable intellectual property laws. Solely for convenience, the trademarks, service marks, logos and trade names referred to in this Annual Report on Form 10-K are without the ® and ™ symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights to these trademarks, service marks and trade names. This Annual Report on Form 10-K contains additional trademarks, service marks and trade names of others, which are the property of their respective owners. All trademarks, service marks and trade names appearing in this Annual Report on Form 10-K are, to our knowledge, the property of their respective owners. We do not intend our use or display of other companies’ trademarks, service marks, copyrights or trade names to imply a relationship with, or endorsement or sponsorship of us by, any other companies.

SUMMARY RISK FACTORS

Our business is subject to numerous risks and uncertainties, including those described in Part I, Item 1A. “Risk Factors” in this Annual Report on Form 10-K. You should carefully consider these risks and uncertainties when investing in our common stock. The principal risks and uncertainties affecting our business include the following:

- We are a development-stage company and have incurred significant losses since our inception. We expect to incur losses for the foreseeable future and may never achieve or maintain profitability.
- We will need additional funding in order to complete development of our product candidates and commercialize our products, if approved. If we are unable to raise capital when needed, we could be forced to delay, reduce or eliminate our product development programs or commercialization efforts.
- Our limited operating history may make it difficult to evaluate the success of our business to date and to assess our future viability.

- Other than SER-109 and SER-287, we are early in our development efforts and may not be successful in our efforts to use our microbiome therapeutics platform to build a pipeline of product candidates and develop marketable drugs.
- Our product candidates are based on microbiome therapeutics, which is an unproven approach to therapeutic intervention.
- Clinical drug development involves a risky, lengthy and expensive process, with an uncertain outcome. We may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.
- Delays or difficulties in the enrollment of patients in clinical trials, could result in our receipt of necessary regulatory approvals being delayed or prevented.
- If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals, we will not be able to commercialize our product candidates or will not be able to do so as soon as anticipated, and our ability to generate revenue will be materially impaired. Additionally, failure to obtain marketing approval in international jurisdictions would prevent our product candidates from being marketed abroad.
- Our collaboration and license agreements with Société des Produits Nestlé S.A. and NHSc Pharma Partners (collectively, Nestlé) are important to our business. If we or Nestlé fail to adequately perform under these agreements, or if we or Nestlé terminate the agreements, the development and commercialization of our CDI and IBD product candidates, including SER-109, SER-287 and SER-301, could be delayed or terminated and our business would be adversely affected.
- We rely, and expect to continue to rely, on third parties to conduct our clinical trials, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials.
- We rely on third parties for certain aspects of the manufacture of our product candidates for preclinical and clinical testing and expect to continue to do so for the foreseeable future. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates or that such quantities may not be available at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.
- Even if any of our product candidates receive marketing approval, it may fail to achieve the degree of market acceptance by physicians, patients, hospitals, third-party payors and others in the medical community necessary for commercial success.
- We face substantial competition, which may result in others discovering, developing or commercializing competing products before or more successfully than we do.
- If we are unable to adequately protect our proprietary technology or obtain and maintain issued patents that are sufficient to protect our product candidates, others could compete against us more directly, which would have a material adverse impact on our business, results of operations, financial condition and prospects.
- The COVID-19 pandemic has adversely impacted and could continue to adversely impact, our business, including our preclinical studies and clinical trials, results of operations and financial condition.
- Our future success depends on our ability to retain key executives and to attract, retain and motivate qualified personnel.
- We may expand our operational capabilities, and as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.
- We will continue to incur costs as a result of being a public company, and our management will continue to devote substantial time to compliance initiatives and corporate governance practices.

PART I

Item 1. Business

Overview

We are a microbiome therapeutics company developing a novel class of live biotherapeutic drugs, which are consortia of microbes designed to treat disease by modulating the microbiome to treat or reduce disease by repairing the function of a disease susceptible microbiome to a non-disease state. We have an advanced drug pipeline with late-stage clinical assets that are formulated for oral delivery and a differentiated microbiome therapeutics drug discovery and development platform including good manufacturing practices, or GMP, manufacturing capabilities for this novel drug modality.

Our highest priority is preparing a biologics license application, or BLA, for submission to the U.S. Food and Drug Administration, or FDA, and preparing for potential commercialization of SER-109, an investigational oral microbiome therapeutic in development for recurrent *Clostridioides difficile* infection, or CDI. We intend to seek agreement with the FDA to begin a rolling BLA submission for SER-109 in the first half of 2022 and to finalize the submission with data from the safety database in mid-2022. SER-109 has obtained Breakthrough Therapy designation, and as a result, we expect priority review by the FDA.

We are also designing microbiome therapeutics to decolonize pathogens and modulate host function to reduce and prevent infections. We believe that the scientific and clinical data from our SER-109 program validate this novel approach, which we refer to as infection protection. We believe the infection protection approach may be replicable across different bacterial pathogens to develop microbiome therapeutics with the potential to protect a range of medically compromised patients from infections. We are evaluating SER-155 in a Phase 1b study in patients receiving allogeneic hematopoietic stem cell transplantation, or allo-HSCT, to reduce incidences of gastrointestinal infections, bloodstream infections and graft-versus-host disease, or GvHD. We are also evaluating additional preclinical stage programs in indications such as cancer neutropenia, solid organ transplant, and antimicrobial resistant infections more broadly.

We continue to focus our resources on evaluating SER-301 in a Phase 1b study in patients with mild-to-moderate ulcerative colitis, or UC, and on analyzing additional biomarker data from our Phase 2b study evaluating SER-287 in patients with mild-to-moderate UC. In July 2021, we announced topline results from the SER-287 Phase 2b study, which did not meet its primary endpoint of improving clinical remission rates compared to placebo. Following the data readout, in December 2021, we completed preliminary microbiome drug pharmacology analyses that demonstrated the successful engraftment of SER-287 bacterial species. However, unlike the Phase 1b study, anticipated changes in disease-relevant metabolites post-administration with SER-287 in the Phase 2b study were not observed. In addition, we have completed preliminary analysis of data from the first cohort of the SER-301 Phase 1b study, which included 15 subjects. Evaluation of the first cohort data by an independent Data Safety Monitoring Board indicated that it would be safe to proceed to the placebo-controlled second cohort. While efficacy was not a defined endpoint in the first cohort, evaluation of clinical outcome data collected as part of the study indicated that no subjects in the first cohort achieved clinical remission as defined by the FDA using the Three-Component Modified Mayo Score after 10 weeks of treatment, though there were improvements in one or more individual components (endoscopic, stool frequency and rectal bleeding subscores) in some patients. Strains in SER-301 were observed to engraft in subjects across the trial period, and based on the assessment of metabolomic data, SER-301 demonstrated pharmacological properties consistent with its design and led to baseline-dependent modulation of the metabolic landscape in the gastrointestinal tract of patients treated. We continue to conduct analyses of data from our SER-287 and SER-301 UC clinical stage programs to inform next steps for further development.

In addition, we continue to evaluate opportunities to advance our technology in modulating host immunity to have an impact on and treat diseases such as cancer and various autoimmune diseases.

SER-109, our lead clinical candidate, which has successfully completed a Phase 3 clinical study, is designed to rapidly modulate the gastrointestinal microbiome in patients with recurrent CDI. CDI is most often caused by the use of broad-spectrum antibiotics, which disrupt the gastrointestinal microbiome by decreasing microbial diversity, thus increasing susceptibility to infection by *Clostridioides difficile*, or *C. difficile*, a spore forming bacterium. *C. difficile* expresses toxins leading to debilitating diarrhea in infected patients, and can also cause more severe outcomes, such as inflammation of the colon (colitis), toxic megacolon and death. The U.S. Centers for Disease Control, or CDC, has identified CDI as one of the top three most urgent bacterial threats in the United States. It is the most common cause of hospital acquired infection in the United States and has overtaken methicillin-resistant *Staphylococcus aureus*, or MRSA, in incidence of disease. CDI is responsible for the deaths of over 20,000 Americans each year. There are approximately 453,000 cases of primary CDI within the United States each year and approximately 170,000 incidences of recurrent CDI. The standard of care for CDI is to treat with antibiotics. In many cases, antibiotic treatments may kill vegetative toxin-producing *C. difficile* bacteria thus resolving symptoms of *C. difficile*. However, these antibiotic treatments also kill beneficial bacteria indiscriminately, thus maintaining or exacerbating the disrupted microbiome, potentially making patients more susceptible to a recurrence of CDI. Furthermore, antibiotics do not eliminate *C. difficile* spores, allowing the spores to rapidly germinate in a disrupted microbiome and cause a recurrence of the infection. Published data suggests that the risk of recurrence is approximately 25% after the

primary CDI and increases to greater than or equal to 40% after a first recurrence. SER-109, if approved, is designed to treat individuals with recurrent CDI.

SER-109 is an oral microbiome therapeutic candidate consisting of a consortium of purified Firmicutes spores. The SER-109 manufacturing purification process is designed to remove unwanted microbes in an effort to reduce the risk of pathogen transmission beyond donor screening alone. SER-109 is designed to reduce recurrent CDI in patients with a history of CDI by modulating the microbiome to a state that resists *C. difficile* germination and growth.

The Phase 3 ECOSPOR III study was a multicenter, randomized, placebo-controlled study that enrolled 182 patients with multiply recurrent CDI. The study was designed to evaluate patients for 24 weeks with the primary endpoint comparing the *C. difficile* recurrence rate in subjects who received SER-109 verses placebo at up to eight weeks after dosing. Previously reported topline data demonstrated that the study achieved its primary endpoint where SER-109 was superior to placebo in reducing CDI recurrence at eight weeks, reflecting a sustained clinical response rate of approximately 88% at eight weeks post-treatment. SER-109 resulted in a 27% absolute reduction of recurrence of CDI compared to placebo at eight weeks post-treatment, which is a relative risk reduction of 68%. The number-needed-to treat was 3.6. The rate of recurrence at 12 weeks in the SER-109 arm was 18.0%, compared to a rate of 46.2% in the placebo arm, representing an absolute risk reduction of 28% (relative risk 0.40; 95% CI 0.24-0.65; $p < 0.001$ and $p < 0.002$ for the test sequence), and thereby consistent with the results seen at eight weeks. Results across stratifications of age and antibiotics remained similar. The study's efficacy results related to the primary endpoint from all analyses exceeded the statistical threshold previously provided in consultation with the FDA that could allow this single clinical study to fulfill efficacy requirements for a BLA. The efficacy results remained durable through 24 weeks of follow-up, as SER-109 was observed to significantly reduced recurrence rates compared to placebo over 24 weeks, 21.3% vs. 47.3%, respectively. In January 2022, these data were published in the *New England Journal of Medicine* (N Engl J Med 2022;386(3):220-229).

We believe the SER-109 safety results across completed studies have been favorable, with an adverse event profile comparable to placebo. In September 2021, we achieved target enrollment of 300 subjects with the ECOSPOR IV open-label study. The target enrollment of a minimum of 300 subjects for the SER-109 safety database was reached in conjunction with the prior completed Phase 3 ECOSPOR III study. To support a BLA submission, Seres is required by the FDA to provide safety data from at least 300 subjects who have received the proposed commercial dose of SER-109 with a 24-week follow-up period. The ECOSPOR IV open-label study includes patients with recurrent CDI, including individuals with a first recurrence of CDI. We intend to seek agreement with the FDA to begin a rolling BLA submission for SER-109 in the first half of 2022 and finalize the submission with data from the safety database in mid-2022. SER-109 has obtained Breakthrough Therapy designation, and as a result, we expect priority review by the FDA.

In November 2021, we initiated a SER-109 expanded access program across the United States. The program is designed to enable eligible adults with recurrent CDI to obtain access to SER-109 prior to a potential FDA product approval.

SER-155, an oral microbiome therapeutic candidate consisting of a consortium of cultivated bacteria, is designed to decrease infection and translocation of antibiotic resistant bacteria in the gastrointestinal tract and modulate host immune responses to decrease GvHD. The rationale for this program is based in part on published clinical evidence from our collaborators at Memorial Sloan Kettering Cancer Center showing that allo-HSCT patients with decreased diversity of commensal microbes were significantly more likely to die due to infection and/or lethal GvHD. SER-155 was designed using our reverse translational discovery platform to potentially reduce incidences of gastrointestinal infections, bloodstream infections and GvHD in patients receiving allo-HSCT. The SER-155 Phase 1b study is designed to include approximately 70 patients in both an open-label and a randomized, double-blind, placebo-controlled cohort that will evaluate safety and tolerability before and after HSCT. Additionally, the engraftment of SER-155 bacteria (a measure of pharmacokinetics) and the efficacy of SER-155 in protecting patients from infections and GvHD will be evaluated. In November 2021, we enrolled the first patient in the SER-155 Phase 1b study.

SER-287, an oral microbiome therapeutic candidate consisting of a consortium of purified Firmicutes spores, is designed to restore a healthy gastrointestinal microbiome in individuals with UC. There are over 700,000 UC patients in the United States and fewer than one-third of patients on current therapies achieve remission. Approved treatments are often inadequate to control disease activity and are often associated with significant side effects, including immunosuppression.

In July 2021, we announced topline results from the Phase 2b study evaluating SER-287 in patients with mild-to-moderate UC. The study did not meet its primary endpoint of improving clinical remission rates compared to placebo. The primary objective of the induction portion of the Phase 2b study was to evaluate the safety and efficacy of SER-287, after 10 weeks of induction dosing (following vancomycin pre-conditioning) in achieving clinical remission in participants with mild-to-moderate UC. The trial was a randomized, placebo controlled, double blind, parallel group multicenter study which enrolled 203 UC patients at approximately 100 sites throughout the U.S. and Canada. Dosing was explored in two SER-287 cohorts (full induction dose and step-down induction dose) versus placebo and patients were randomized according to a 1:1:1 ratio. Clinical remission was analyzed and defined by a 3-component modified Mayo Score. No statistically significant differences were observed in absolute clinical remission rates between the three treatment arms (10.3% for the full induction dose, n=68 and 10.6% for the step-down induction dose, n=66 versus 11.6% for placebo, n=69). There were also no statistically significant differences observed across the three treatment groups for endoscopic improvement, endoscopic remission or symptomatic remission.

Both dosing regimens of SER-287 were generally well tolerated. Treatment emergent adverse events, or AEs, were observed in 67.6%, 46.2% and 50.7% of subjects in the induction dose, step-down dose (both of which included six days of oral vancomycin preconditioning) and placebo treatment arms, respectively. The majority of observed AEs were mild or moderate in severity. The most commonly observed AEs were UC, diarrhea, nausea and abdominal distension. Four participants on active treatment reported serious treatment emergent adverse events (worsening UC, colonic dysplasia, congestive heart failure with decreased hemoglobin, and appendicitis), as did one on placebo (worsening UC).

In December 2021, we completed preliminary microbiome drug pharmacology analyses from the Phase 2b study that demonstrated the successful engraftment of SER-287 bacterial species. Based on the SER-287 Phase 2b microbiome data analyses, engraftment of SER-287 bacteria, measured as the median number of bacteria observed across patients post treatment, was statistically significant in patients receiving SER-287 versus placebo ($p \leq 0.001$ at all timepoints). The magnitude and kinetics of engraftment were comparable to our Phase 1b study. However, unlike the Phase 1b study, anticipated changes in disease-relevant metabolites post-administration with SER-287 in the Phase 2b study were not observed. Analysis of the genomic and metabolomic data characterizing the microbiome of SER-287 study participants at baseline and post dosing suggest potential biomarkers for inclusion of targeted patient subpopulations in future development efforts.

We are also advancing SER-301, a therapeutic candidate for UC. SER-301 is a rationally-designed consortia of cultivated bacteria designed using our reverse translational discovery platform that incorporates analysis of microbiome biomarkers from human clinical data and preclinical assessments using human cell-based assays and *in vitro*/*ex vivo* and *in vivo* disease models. SER-301 is formulated for oral delivery. The design of SER-301 incorporates insights obtained from the SER-287 Phase 1b clinical and microbiome results, as well as from our clinical portfolio more broadly, and additional functional data from preclinical assessments, in an effort to optimize desired pharmacological properties. SER-301 is designed to reduce induction of pro-inflammatory activity, improve epithelial barrier integrity and TNF-α driven inflammation in intestinal epithelial cells, or IECs, and modulate UC-relevant anti-inflammatory, innate and adaptive immune pathways. SER-301 is being produced by our advanced fermentation, formulation and delivery platforms. It includes strains delivered in spore form, as well as strains fermented in non-spore (vegetative) form and delivered using enterically-protected technology designed to release in the colon.

The SER-301 Phase 1b study is being conducted in Australia and New Zealand in subjects with mild-to-moderate UC and is designed to include approximately 65 patients distributed across two cohorts.

We have completed preliminary analysis of data from the first cohort of the SER-301 Phase 1b study, which included 15 subjects. Evaluation of the first cohort data by an independent Data Safety Monitoring Board indicated that it would be safe to proceed to the placebo-controlled second cohort. While efficacy was not a defined endpoint in the first cohort, evaluation of clinical outcome data collected as part of the study indicated that no subjects in the first cohort achieved clinical remission as defined by the FDA using the Three-Component Modified Mayo Score after 10 weeks of treatment, though there were improvements in one or more individual components (endoscopic, stool frequency and rectal bleeding subscores) in some patients. Strains in SER-301 were observed to engraft in subjects across the trial period with the number of engrafting strains exceeding expectations at multiple sampling time points. A dual formulation was evaluated in the first cohort and the extent of engraftment across subjects was correlated with whether bacteria were formulated as bacterial spores versus vegetative strains; the former demonstrating stronger engraftment across all patients.

Based on the assessment of metabolomic data, SER-301 demonstrated pharmacological properties consistent with its design and led to baseline-dependent modulation of the metabolic landscape in the gastrointestinal tract of patients treated; changes were observed in short-chain and medium-chain fatty acids, tryptophan-derived metabolites, bile acids, and other microbe-associated metabolites, as well as host metabolites associated with a non-disease state. These SER-301 metabolomic results were encouraging compared with the results observed in the SER-287 Phase 2b study, in which the metabolic changes were not observed in general across subjects administered with SER-287. Additionally, changes in disease-relevant metabolites in SER-301 were observed to be greater in a definable subpopulation of patients.

The degree of metabolic changes observed following SER-301 administration appeared to be dependent on the baseline metabolic profile of the study subjects, providing support for the potential for microbiome therapeutics to be developed in biomarker-identified UC patient subpopulations.

We continue to conduct analyses of data from our SER-287 and SER-301 UC clinical stage programs to inform next steps for further development.

We have assembled a world class group of scientists, clinicians, directors and investors, who have established our leadership in the field of microbiome therapeutics. We were co-founded by Drs. Noubar Afeyan, David Berry and Geoffrey von Maltzahn of Flagship Pioneering. Through Flagship Pioneering's contribution of foundational scientific concepts and intellectual property, assembly of our management team and critical early-stage support, we launched as the first company focused on the ecological nature of the microbiome. Led by Eric Shaff, our President and Chief Executive Officer, our experienced management team possesses core capabilities and know-how in microbiome therapeutics, drug development, commercialization, chemistry, manufacturing and controls, or CMC, public company management and finance.

Our Strategy

Our goal is to remain the leading biopharmaceutical company developing and commercializing microbiome therapeutics to address significant unmet medical needs. We intend to focus in the near term on gaining FDA approval for SER-109 for recurrent CDI and continuing development of our highest priority clinical programs. Additionally, we continue to advance our differentiated microbiome drug discovery, development and manufacturing platforms and capabilities.

Advancing our Programs

- ***Preparing a BLA submission for our lead product candidate, SER-109, for patients with recurrent CDI.*** Analyses from the Phase 3 ECOSPOR III study demonstrated that SER-109 achieved its primary endpoint of superiority to placebo in reducing CDI recurrence at week 8 in patients with recurrent CDI. We achieved target enrollment in our open-label study of SER-109 in patients with recurrent CDI, which also admits patients with a single recurrence of recurrent CDI, to expand the SER-109 safety database. Based on our interactions with the FDA to date, we believe the ECOSPOR III efficacy results should support a BLA submission without conducting an additional pivotal study. We intend to seek agreement with the FDA to begin a rolling submission of the BLA for SER-109 in the first half of 2022 and finalize the submission with data from the safety database in mid-2022. SER-109 has obtained Breakthrough Therapy designation, and as a result, we expect priority review by the FDA.
- ***Advancing preparations for potential commercialization of SER-109.*** In July 2021, we announced a partnership with Nestlé, which will utilize its global pharmaceutical business, Aimmune Therapeutics, Inc., to jointly commercialize SER-109, if approved, in the United States and Canada. Commercial product supply for the initial phase of U.S. commercial supply is being produced at our Cambridge manufacturing facility and further processed at GenIbet, a contract manufacturing organization, or CMO, which was acquired in February 2022 by Recipharm AB, or Recipharm, a multi-national CMO based in Sweden. In November 2021, we entered into a collaboration with BacThera AG, or Bacthera, a global leader in biopharmaceutical product manufacturing, to expand upon our existing capabilities for commercial product supply to meet anticipated demand in later years. Under the terms of the agreement, Bacthera will construct a dedicated full-scale production suite for us at Bacthera's Microbiome Center of Excellence in Visp, Switzerland, which is currently under construction, and provide manufacturing services to us for SER-109.
- ***Maximizing the opportunity in infection protection.*** We believe that the scientific and clinical data from our SER-109 program validate our novel approach of using microbiome therapeutics to decolonize pathogens and modulate host function to reduce and prevent infections. This approach, which we refer to as infection protection, may be replicable across different bacterial pathogens to develop microbiome therapeutics with the potential to protect a range of medically compromised patients from infections. We are evaluating SER-155 in a Phase 1b study in patients receiving allo-HSCT to reduce incidences of gastrointestinal infections, bloodstream infections and GvHD. In November 2021, we enrolled the first patient in the SER-155 Phase 1b study. We are also evaluating additional preclinical stage programs in indications such as cancer neutropenia, solid organ transplant, and antimicrobial resistant infections more broadly.
- ***Optimizing plans for continued development in UC based on SER-287 and ongoing SER-301 trial data.*** We are developing SER-301, a microbiome therapeutic candidate comprised of a consortium of cultivated bacteria, for the treatment of UC leveraging pharmacokinetic and pharmacodynamic data from our SER-287 clinical trial, our knowledge of modulation of the microbiome seen in patients with UC, as well as insights from our SER-262 clinical study. The SER-301 Phase 1b study is being conducted in Australia and New Zealand in subjects with mild-to-moderate UC and is designed to include approximately 65 patients distributed across two cohorts. We have completed preliminary analysis of data from the first cohort of the SER-301 Phase 1b study, which included 15 subjects. Evaluation of the first cohort data by an independent Data Safety Monitoring Board indicated that it would be safe to proceed to the placebo-controlled second cohort. While efficacy was not a defined endpoint in the first cohort, evaluation of clinical outcome data collected as part of the study indicated that no subjects in the first cohort achieved clinical remission as defined by the FDA using the Three-Component Modified Mayo Score after 10 weeks of treatment, though there were improvements in one or more individual components (endoscopic, stool frequency and rectal bleeding subscores) in some patients. Strains in SER-301 were observed to engraft in subjects across the trial period, and based on the assessment of metabolomic data, SER-301 demonstrated pharmacological properties consistent with its design and led to baseline-dependent modulation of the metabolic landscape in the gastrointestinal tract of patients treated. We continue to conduct analyses of data from our SER-287 and SER-301 UC clinical stage programs to inform next steps for further development.

Advancing Our Capabilities

- ***Leveraging our leading reverse translation microbiome therapeutics platform to develop additional innovative and novel microbiome therapeutics across a range of serious medical conditions with high unmet need including infectious and inflammatory disease and disease associated with modulation of host immunity.*** We believe that the combination of experience, proprietary data and proprietary know-how related to the microbiome, the functional properties of microbial species and strains, microbe-host interactions, the cultivation of microbial strains, and microbiome-specific functional screens and analytics provides us a competitive advantage in the design and development of microbiome therapeutics. Our platform enables us to build upon our existing and growing clinical experience to rationally design treatments for acute and complex chronic diseases. We intend to leverage this advantage to develop additional innovative microbiome therapeutics.
- ***Developing manufacturing capabilities sufficient to support commercialization of any approved microbiome therapeutic candidates.*** Microbiome therapeutic manufacturing requires capabilities that are distinct from other biologic drugs. We have made strategic investments in manufacturing capabilities to help ensure that we maintain control of our know-how and also because we believe these capabilities will be necessary and highly advantageous for the development of future microbiome therapeutic candidates. Our bioprocess and manufacturing personnel are focused on creating a platform of manufacturing expertise that will set the stage for further advances in the emerging field of microbiome therapeutics.

Our Microbiome Therapeutics Platform

We have developed the leading microbiome therapeutics platform which we believe enables us to apply our capabilities to efficiently identify, manufacture and develop novel microbiome therapeutics for serious human diseases. We use a reverse translational discovery platform that incorporates analysis of microbiome biomarkers from human clinical data and preclinical assessments using human cell-based assays and *in vitro/ex vivo* and *in vivo* disease models. Specifically, we start with data sets from both healthy subjects and subjects with disease to delineate at high-resolution the composition of the microbiome and physiological state of subjects and to identify specific microbiome and host signatures that associate with disease or the onset of disease. These in-human insights on how different microbe species and strains and microbe-associated metabolites are associated with disease along with how these microbes and metabolites directly or indirectly modulate disease-relevant functional pathways in the host are leveraged in preclinical drug design and development.

Our discovery process begins with human data derived from clinical trials and cohort studies, which we use as a basis for target identification and the design of our microbiome therapeutic candidates. We compare healthy, normal colonic microbiomes to those in an unhealthy disrupted or disease state, revealing the ecological, compositional and functional differences between various states of disease and during the transition from health to disease or vice versa. Specifically, we utilize high-value clinical data sets combined with advanced data sciences and microbiome analytics to identify microbiome signatures of disease at the resolution of specific species and strains, metabolites, and even genes that are associated with disease states. These microbiome biomarkers are associated with host signatures and biomarkers of disease to identify drug targets for our microbiome therapeutics. Our clinical data from the SER-109, SER-262, SER-287 and SER-301 programs, and microbiome data generated with external collaborators, serve to instruct us on how the introduction of certain keystone microbes have the potential to restructure the microbiome and modulate the metabolic state of the gut to shift it to a non-disease state.

We have developed a proprietary functionally characterized strain library and a suite of assays and screens, bioinformatics and computational tools, and databases, which facilitate our insights into the human microbiome. We have established proprietary, curated, reference databases and algorithms that: (i) integrate high-resolution genomic, metagenomic, metabolomic, and transcriptomic data sets, and data from *in vitro* and human cell-based assays, and *in vitro/ex vivo* and *in vivo* disease models, and (ii) enable us to track changes in the microbiome at the level of microbial species and individual strains and associate these changes with changes in the metabolic state of the gut and host physiology. Our analytics can integrate gene profiling and metabolomics data (the small molecules made by the microbiome) with genomic data (the collection of microbes defined by sequencing) to delineate microbiome biomarkers (the specific species or strains and functional pathways) that contribute to the state of disease or health. Further, we have established *de novo* analytics for pharmacokinetic and pharmacodynamic assessments of microbiome therapeutics. Additionally, leveraging all of these data we have curated and continue to build a database that links and associates: (i) functional properties of microbial species/strains, (ii) functional pathways in hosts that can be modulated by the microbiome, (iii) the association of functional pathways to disease, and (iv) the association of existing non-microbiome drugs to the functional pathways. This continually growing database can be mined to inform drug design and disease area and patient population prioritization.

Our proprietary strain library of bacterial isolates from healthy donors and patients enables us to translate microbiome biomarker insights into defined consortia of bacteria. The strain library contains bacterial species isolated from individuals that are either healthy or that have a disease. Seres has developed extensive isolation and cultivation know-how. The strain library contains a majority of the Human Microbiome Project's "most wanted" and many novel species not described in other databases or the scientific literature. The functional properties of strains are characterized using proprietary *in vitro* and *ex vivo* human cell-based assays as well as full-genome sequences and genome functional annotation. Functional characterization of target strains includes properties such as how the bacteria interact with human colonic epithelial cells and human immune cells. We also seek to understand how these microbes improve the health of barrier cells in the gut and how they may impact immune responses.

We select bacteria from our library with specific predicted properties using novel algorithms for *in silico* functional design and optimization and grow the compositions in the lab to be tested both *in vitro/ex vivo models* as delineated above and in *in vivo* animal models. Our animal models include conventional mice, germ-free mice, and "humanized avatar" mice that possess only bacteria derived from humans; these models were developed to minimize confounding variables presented by model organism microbes. Data from our *in vitro/ex vivo* and *in vivo* screens are analyzed and used to optimize compositional designs; introducing new bacterial strains and optimizing existing strains until we identify a lead composition suitable for clinical testing.

Finally, we manufacture the bacterial composition under current Good Manufacturing Practices, or cGMP, which are required by FDA and European regulators. We believe our unique manufacturing capacities position us to exploit the insights of our proprietary human data and the novel biology of species and strains that have not previously been used for therapeutics. We have optimized fermentation conditions to generate spores and enhance bacterial yields in anaerobic fermentation and have in-house capabilities to formulate both spores and live non-spore bacteria. Our manufacturing facility in Cambridge, Massachusetts was designed to be fit-for-purpose and is highly differentiated compared to the offerings of commercial contract research organizations. We have secured additional capacity, designed to our specifications, via contract manufacturing organizations, or CMOs, to ensure adequate supply for potential commercial products. We continue working to address quality control requirements for our microbiome therapeutic candidates using proprietary microbiological and sequence-based testing schemes, including high-throughput quantitative analytics to assess the identity, potency, and purity of the final product. We intend to work with regulators to meet the requirements for product approval.

Taken together, we believe our platform, spanning drug discovery, preclinical translation, and novel manufacturing and quality control approaches, has enabled a field leading pipeline across a range of therapeutics areas.

Disease Overview and Our Product Pipeline

We believe our microbiome therapeutic candidates represent a novel approach with potential application across a broad range of human diseases. Our lead product candidate, SER-109, is designed to reduce further recurrence of CDI, a debilitating infection of the colon, in patients who have received antibiotic therapy for recurrent CDI by restructuring the gastrointestinal microbiome and modulating the metabolic landscape to address CDI. In August 2020, we announced that SER-109 had achieved its primary endpoint of superiority to placebo in reducing CDI recurrence at week 8 in our Phase 3 ECOSPOR III clinical trial in patients with recurrent CDI. SER-109 was observed to be well tolerated, with no treatment-related serious adverse events observed in the active arm and adverse events comparable to placebo. If approved by the FDA, we believe SER-109 will be a first-in-field oral microbiome drug. Building upon SER-109, we are developing novel microbiome therapeutics, such as SER-155, to specifically target infections and antimicrobial resistance. SER-155, a microbiome therapeutic candidate consisting of a consortium of cultivated bacteria, is designed to reduce incidences of gastrointestinal infections, bloodstream infections and GvHD in patients receiving allo-HSCT. In addition, using our microbiome therapeutics platform, we are also developing SER-287 and SER-301 to treat UC. We continue to evaluate microbiome pharmacokinetic and pharmacodynamic data from across our clinical and pre-clinical portfolios using our reverse translation microbiome therapeutics capabilities to conduct research on various indications, including inflammatory and immune diseases, cancer, and metabolic diseases.

CDI Overview and SER-109

Clostridioides difficile Infection

C. difficile is a Gram-positive, toxin-producing, spore forming bacterium that may cause debilitating diarrhea in infected individuals, but can also lead to more severe outcomes, such as inflammation of the colon, or colitis, toxic megacolon and death. *C. difficile* bacteria express toxins that disrupt the structural architecture of cells causing leakage of fluids through the gastrointestinal, or GI, epithelium. The cells disrupted by these toxins eventually undergo apoptosis and die, disrupting the epithelial barrier and exposing the immune system to inflammatory stimuli, severe and persistent diarrhea and, in the most serious cases, death.

CDI is most often associated with the prior use of antibiotics, although age and poor immune status are important risk factors as well. Antibiotics are thought to decrease colonization resistance to CDI by disrupting the microbiome. Since *C. difficile* spores are able to survive for long periods of time outside the body, and because healthcare settings are often sites of significant antibiotic use, CDI is a leading cause of healthcare-associated infections in the United States. CDI is also a cause of morbidity and mortality among hospitalized cancer patients and bone marrow transplant patients as their immune systems are suppressed by cytotoxic drugs, which

inhibit or prevent the functioning of cells, and they may be heavily treated with antibiotics to prevent or treat infections. More recently, the rise of community-acquired CDI has been recognized as a growing problem.

The Centers for Disease Control and Prevention, or CDC, has identified *C. difficile* as one of the top three most urgent antibiotic-resistant bacterial threats in the United States. It is the most common cause of hospital acquired infection in the United States, having overtaken MRSA. CDI is responsible for the deaths of over 20,000 Americans each year. There are approximately 453,000 cases of primary CDI within the United States each year and approximately 170,000 incidences of recurrent CDI. CDI is also costly to the healthcare system. According to a study published in Clinical Infectious Diseases, the economic burden of CDI in 2008 in U.S. acute care facilities alone was estimated to be as much as $4.8 billion. In addition, the average recurrent CDI treatment cost in the U.S. is estimated to be $34 thousand per patient, comprising mostly (88%) hospital-related costs (*Rodrigues Infect Control Hosp Epidemiol 2017*). The national incidence of CDI remains high despite declining from 476,000 in 2011 to 462,000 in 2017 (Guh, *New England Journal of Medicine 2020*). Further, according to a 2014 article in the *American Journal of Infection Control*, from 2001 to 2010, incidence of CDI per 1,000 patients discharged increased from 4.5 to 8.2 with an average hospital stay of eight days. Due to suboptimal approaches to treatment, patients with primary CDI have an approximate 20% - 25% change of recurrent infection increasing to greater than 40% after the first recurrence (*Gerding, CID 2018; Lashner ACG 2020; Dubberke CID 2018*).

Current and developing treatment alternatives and their limitations

Antibiotics. According to the Infectious Disease Society of America, or IDSA, guidelines, the current standard of care for primary CDI is to treat with antibiotics, such as fidaxomicin or vancomycin. Fidaxomicin is recommended to treat primary CDI, it does not have a label claim to reduce or prevent CDI recurrence. No antibiotic therapeutics are currently approved for treatment of recurrent CDI.

Recurrent CDI, defined as the presence of diarrhea and a positive *C. difficile* stool assay within two to eight weeks following the initial episode, is not well addressed by any of the available antibiotics. The risk of recurrent CDI increases to greater than 40% after the first recurrence. In extreme cases, patients may be treated continuously for years with vancomycin.

Antibiotics have two major limitations: they have no effect on the spores that germinate in a disrupted microbiome and their use appears to exacerbate microbiome disruption, resulting in increased risk of future CDI. Research in animal models has shown that antibiotic use not only eliminates many healthy bacteria in the GI tract, but also leads to the release of nutrients that facilitate the growth of *C. difficile*. Antibiotics have also been shown to change the ratio of primary versus secondary bile acids in the colon by killing bacteria required to metabolize bile acids. This shift to a predominance of primary bile acids further facilitates the growth of *C. difficile*, as it requires primary bile acids for germination of its spores. As a result, antibiotic use may induce a lasting microbiome disruption that makes it possible for *C. difficile* to colonize a person and then cause, or further perpetuate, disease.

Fecal microbiota transplantation. FMT, also known as a stool transplantation, is an unapproved procedure during which donated stool, including fecal microbes, is typically instilled via colonoscopy into a patient with recurrent CDI. FMT presents several challenges for effective treatment of the disease. FMT has the potential to transmit infectious or allergenic agents between hosts, involves the transmission of hundreds of unknown strains of bacteria, fungi, viruses and potentially parasites from donor to subject, and is difficult to perform on a mass scale. In November 2019 the FDA held a public hearing to obtain input on the use of FMT to treat *Clostridioides difficile* infection not responsive to standard therapies. Presentations were made by the academic community and development companies regarding the current and future use of FMT. In January, 2020, we submitted comments to the docket for the meeting that recommended: 1) increased scrutiny and regulation of unapproved, commercially available FMT that does not comply with IND requirements; 2) implementation of guidance for establishing safety of source materials for all microbiome products; and 3) safety and efficacy of all microbiome products to reduce recurrent CDI must be based on adequate and well controlled clinical trials including accurate assurance of diagnosis of the disease state – specifically toxin testing.

Additionally, FMT is inherently non-standardized so that different desired and/or undesired material may be transmitted in any given donation. FMT is not approved by the FDA and we believe that, as currently practiced by clinical centers in the United States, it may be unable to gain such approval since the product, to our knowledge, cannot be characterized according to current regulatory requirements for identity, potency, purity and safety and has not been tested in rigorous, placebo controlled, randomized and blinded clinical studies. Commercial providers of FMT must meet FDA regulatory requirements for a biologics license and must produce FMT material using cGMP.

Antibodies. Bezlotoxumab a fully human monoclonal antibody directed against *C. difficile* toxin B was approved in the United States in October 2016 and in Europe in 2017 for the treatment of CDI. The antibody demonstrated 10% absolute risk reduction in preventing recurrence of CDI. Antibodies bind toxins to alleviate the symptoms of CDI, but they do not address the underlying disruption of the microbiome, which we believe is the cause of recurrent CDI. Bezlotoxumab requires intravenous infusion.

SER-109

SER-109 is an oral microbiome therapeutic candidate consisting of a consortium of purified Firmicutes spores. The SER-109 manufacturing purification process is designed to remove unwanted microbes in an effort to reduce the risk of pathogen transmission beyond donor screening alone. SER-109 is designed to reduce recurrent CDI in patients with a history of CDI by modulating the

microbiome to a state that resists *C. difficile* germination and growth. SER-109 is designed to treat individuals with recurrent CDI, a patient population which includes approximately 170,000 cases per year in the United States.

Phase 1b/2 clinical study

The Phase 1b/2 clinical study was an open-label, single arm, descending-dose study that enrolled 30 patients with recurrent CDI. All enrolled patients received standard-of-care antibiotic treatment, followed by oral administration of SER-109. Of the 30 study patients, 26 (87%) achieved the primary endpoint of absence of CDI (defined in this study as more than three unformed bowel movements in a 24-hour period with laboratory confirmation of a positive *C. difficile* stool test) up to eight weeks following dosing. Three of the four patients who did not meet the primary endpoint were determined by their primary investigator to be recovering from CDI, and all symptoms resolved without further therapeutic intervention or antibiotics. In total, 29 of 30 patients (97%) achieved the clinical cure rate, which we defined as the absence of CDI requiring antibiotic treatment during the eight-week period after SER-109 dosing. SER-109 was well tolerated in the study, with the most common adverse events being mild to moderate gastrointestinal symptoms. No drug related serious adverse events were observed.

Phase 2 clinical study

The Phase 2 clinical study was a randomized, double-blinded, placebo-controlled, parallel-group two arm trial that enrolled a total of 89 patients with a history of multiply-recurrent CDI, defined as 3 or more CDI episodes within 9 months. SER-109 was administered orally following the completion of antibiotic treatment for CDI. The predefined study primary efficacy endpoint was the relative risk of CDI recurrence up to 8 weeks after treatment with SER-109 compared to treatment with placebo. CDI recurrence was defined as diarrhea for 2 or more consecutive days, a positive CDI test, and the requirement for antibiotic treatment. Based on 8-week data, CDI recurrence occurred in 44% of subjects (26 of 59) who received SER-109, compared to 53% of subjects (16 of 30) who received placebo. The relative risk of CDI recurrence for the placebo population compared to the SER-109 population was not statistically significant. The most commonly reported AEs in both the SER-109 and placebo arms were in the GI category, and were diarrhea, abdominal pain, flatulence, and nausea. No drug-related SAEs were observed.

Analysis of Phase 1b/2 and Phase 2 clinical study results

In our Phase 2 clinical study, the study's primary endpoint of reducing the relative risk of CDI recurrence at up to 8 weeks after treatment was not achieved. In order to understand the difference in outcome between Phase 1b/2 and Phase 2 clinical studies, we conducted an analysis of the available clinical, microbiome and CMC data. We identified key factors that potentially explain the Phase 2 clinical study results, including issues related to both the accurate diagnosis of *C. difficile* recurrent infection, and potential suboptimal dosing of subjects in the trial.

The key factors include:

- The diagnostic test for entry may not have differentiated subjects with active CDI disease from those with other disease but who had *C. difficile* carriage (e.g., irritable bowel syndrome);
- The diagnostic test for CDI recurrence during the study (the primary endpoint) overestimated recurrences, as PCR was the most common test performed;
- The safety profile of SER-109, which may include diarrhea in the first week following dosing, led to SER-109 subjects presenting for evaluation of recurrence at a time when they were likely to be colonized with *C. difficile* leading to mistaken diagnosis of recurrent CDI; and
- The dose and dosing regimen used in the study may not have been optimal in the Phase 2 clinical study based upon an assessment of the microbiome response using whole metagenomics shotgun sequencing.

From our reanalysis of the phase 1b/2 and 2 trials, we learned that there is a dose-dependent response governing early SER-109 pharmacokinetics, with increased engraftment associated with successful CDI resolution through 8 weeks. In the Phase 2 trial, SER-109 was dosed at 1×10^8 spores based on equivalent clinical outcomes and week 8 engraftment measures observed between the phase 1 dosing cohorts. However, our integrated analysis of both trials revealed that (1) engraftment kinetics at week 1 were of greater importance for reducing rCDI than later time points, (2) week 1 engraftment was highly variable in Phase 2 subjects, and (3) rapid engraftment was dependent on dose, which was clearly suboptimal in the Phase 2 trial (McGovern, 2020; Young, 2020). We hypothesized that rapid engraftment of a microbiome therapeutic may be critical to efficacy since CDI recurrence usually occurs within 1–3 weeks of antibiotic discontinuation, the "window of vulnerability"; consistent with this hypothesis, in the Phase 2 trial, greater engraftment of SER-109 species at week 1 was correlated with reduced CDI rates. This correlation was not previously appreciated due to the use of lower resolution 16S rRNA gene amplicon–based methods used in the Phase 1b/2 study for determining drug engraftment (Khanna, 2016).

Phase 3 clinical study design

In the Phase 3 clinical study of SER-109, patients with multiply recurrent CDI were randomized 1:1 between SER-109 and placebo. Diagnosis of CDI for both study entry and for endpoint analysis utilized a *C. difficile* cytotoxin assay, compared to the Phase 2 clinical study, where most patients were diagnosed by PCR. Patients in the SER-109 arm received a total SER-109 dose,

administered over three days, approximately 10-fold higher than the dose used in the Phase 2 clinical study to drive rapid engraftment of SER-109 bacteria in treated patients. The study evaluated patients for 24 weeks and the primary endpoint was to compare the *C. difficile* recurrence rate in subjects who receive SER-109 verses placebo at up to eight weeks after dosing. CDI recurrence is defined as diarrhea (>3 unformed bowel movements/day for 2 or more consecutive days), a positive CDI toxin test, and the decision by the primary investigator that antibiotic treatment is warranted. The study was conducted at approximately 100 sites in the United States and Canada.

Phase 3 clinical study results

The study enrolled 182 patients with multiply recurrent CDI. Previously reported topline data demonstrated that the study achieved its primary endpoint where SER-109 was superior to placebo in reducing CDI recurrence at eight weeks, reflecting a sustained clinical response rate of approximately 88% at eight weeks post-treatment. SER-109 resulted in a 27% absolute reduction of recurrence of CDI compared to placebo at eight weeks post-treatment, which is a relative risk reduction of 68%. The number-needed-to treat was 3.6. The rate of recurrence at 12 weeks in the SER-109 arm was 18.0%, compared to a rate of 46.2% in the placebo arm, representing an absolute risk reduction of 28% (relative risk 0.40; 95% CI 0.24-0.65; $p < 0.001$ and $p < 0.002$ for the test sequence), and thereby consistent with the results seen at eight weeks. Results across stratifications of age and antibiotics remained similar. The study's efficacy results related to the primary endpoint from all analyses exceeded the statistical threshold previously provided in consultation with the FDA that could allow this single clinical study to fulfill efficacy requirements for a BLA. The efficacy results remained durable through 24 weeks of follow-up, as SER-109 was observed to significantly reduced recurrence rates compared to placebo over 24 weeks, 21.3% vs. 47.3%, respectively. In January 2022, these data were published in the *New England Journal of Medicine* (N Engl J Med 2022;386(3):220-229).

We believe the SER-109 safety results across completed studies have been favorable, with an adverse event profile comparable to placebo. There was no clinically meaningful imbalance in incidence of adverse events between SER-109 and placebo arms. Overall incidence of patients who experienced treatment-emergent adverse events, or TEAEs, was 92.2% for SER-109 and 91.3% for placebo. SER-109 had no related serious treatment-related adverse events and no treatment related infections. The most commonly observed TEAEs were gastrointestinal disorders, the majority of which were mild to moderate in nature.

The study also examined the pharmacokinetics (i.e., drug bacterial species engraftment) and pharmacodynamics (i.e., metabolic changes) following SER-109 dosing. The data demonstrate that SER-109 administration resulted in the rapid and durable engraftment of SER-109-derived bacterial species into the gastrointestinal tract as soon as one week following dosing, and that this engraftment was maintained at subsequent timepoints evaluated, including at the eight-week timepoint corresponding to the study's primary endpoint and the 24-week safety follow-up timepoint. The presence of SER-109 bacterial species was significantly greater ($p<0.001$) in SER-109 treated patients than in placebo patients at all timepoints evaluated. Significant differences were maintained in predefined subpopulation analyses of age and antibiotic use. Seres utilized advanced microbiome biomarker analytics and proprietary genomic reference datasets to identify, at a resolution of bacterial species, the gastrointestinal microbiome signatures associated with SER-109 engraftment.

SER-109 administration also resulted in modulation of the gastrointestinal metabolic landscape. Notably, data demonstrated a significant decrease in primary bile acids ($p=0.038$) and an increase in secondary bile acids ($p<0.001$) by one-week post-dosing; significant differences were maintained through week eight for secondary bile acids. Notably, SER-109 subjects had less variance across subjects in bile acid response than placebo subjects. Observations for both primary and secondary bile acids were maintained in predefined subpopulation analyses of age and antibiotic use. All microbiome analyses were conducted according to the treatment subjects actually received. Published research as well as preclinical studies have demonstrated that primary bile acids support germination of *C. difficile* spores that are the source of disease recurrence. In contrast, secondary bile acids have been reported to inhibit germination and the growth of *C. difficile* (Theriot and Young, Annu. Rev. Microbiol. 2015).

In September 2021, we achieved target enrollment of 300 subjects with the ECOSPOR IV open-label study. The target enrollment of a minimum of 300 subjects for the SER-109 safety database was reached in conjunction with a prior completed Phase 3 study, ECOSPOR III. To support a BLA submission, Seres is required by the FDA to provide safety data from at least 300 subjects who have received the proposed commercial dose, with a 24-week follow-up period. The ECOSPOR IV open-label study includes patients with recurrent CDI, including individuals with a first recurrence of CDI. We intend to seek agreement with the FDA to begin a rolling BLA submission for SER-109 in the first half of 2022 and finalize the submission with data from the safety database in mid-2022. SER-109 has obtained Breakthrough Therapy designation, and as a result, we expect priority review by the FDA.

In November 2021, we initiated a SER-109 expanded access program across the United States. The program is designed to enable eligible adults with recurrent CDI to obtain access to SER-109 prior to a potential FDA product approval.

Sales and Marketing

If SER-109 is approved in the United States and Canada, we believe it can be commercialized with a focused specialty sales force that will target gastrointestinal and infectious disease physicians, which are the two primary groups of physicians who treat recurrent CDI patients. While preparing a BLA for submission, we have also initiated commercial readiness activities that include: *C. difficile* market assessments, publication and presentation planning, stakeholder and advocacy relationship mapping, brand name selection, and initiation of payer and reimbursement strategic planning.

In addition, in July 2021, we entered into an agreement with NHSc Pharma Partners, or, together with Société des Produits Nestlé S.A, Nestlé, to jointly commercialize SER-109 in the United States and Canada. Under the terms of the agreement, Nestlé will utilize its global pharmaceutical business Aimmune Therapeutics, Inc. and will assume the role of lead commercialization party. We received license payments of $175 million up front, and will receive an additional $125 million upon FDA approval of SER-109. The agreement also includes sales target milestones which, if achieved, could total up to $225 million. We will be responsible for development and pre-commercialization costs in the United States. Upon commercialization, we will be entitled to an amount equal to 50% of the commercial profits.

The agreement to co-commercialize SER-109 in the United States and Canada represents a second strategic collaboration between the companies. Nestlé already has commercial rights to our investigational treatments for CDI and IBD outside of the United States and Canada, and with the July 2021 expansion, Nestlé became our global collaborator in SER-109.

Infection Protection and SER-155

We believe that the scientific and clinical data from our SER-109 program validate our novel approach of using microbiome therapeutics to decolonize pathogens, resulting in reduced rate of infections in medically compromised patients. Data from the SER-109 Phase 3 trial published in the *New England Journal of Medicine* show that microbiome therapeutics can restructure the gut microbiome and shift the gut metabolic landscape. Additional data show that SER-109 rapidly reduces the abundance of bacteria associated with common antibiotic resistance genes, or ARGs, and reduces ARG abundance in the gut. Collectively, these data demonstrate the potential for microbiome therapeutics to restore colonization resistance and ultimately to reduce infections and antimicrobial resistance. This approach, which we refer to as infection protection, may be replicable in protecting a range of medically compromised patients from infections seeded by the gut microbiome. It may also enable us to reduce antimicrobial resistant infections, which the World Health Organization declared as a top ten global public health threat facing humanity.

We are evaluating SER-155 in a Phase 1b study in allo-HSCT recipients to reduce incidences of gastrointestinal infections, bloodstream infections and GvHD. We are also evaluating additional preclinical stage programs in indications such as cancer neutropenia, solid organ transplant, and antimicrobial resistant infections more broadly.

SER-155, an oral microbiome therapeutic candidate consisting of a consortium of cultivated bacteria, is designed to decrease infection and translocation of antibiotic resistant bacteria in the gastrointestinal tract and modulate host immune responses to decrease GvHD. The rationale for this program is based in part on published clinical evidence from our collaborators at Memorial Sloan Kettering Cancer Center showing that allo-HSCT patients with decreased diversity of commensal microbes are significantly more likely to die due to infection and/or lethal GvHD. SER-155 was designed using our reverse translational discovery platform to reduce incidences of gastrointestinal infections, bloodstream infections and GvHD in patients receiving allo-HSCT. The SER-155 Phase 1b study is designed to include approximately 70 patients in both an open-label and a randomized, double-blind, placebo-controlled cohort that will evaluate safety and tolerability before and after HSCT. Additionally, the engraftment of SER-155 bacteria (a measure of pharmacokinetics) and the efficacy of SER-155 in preventing infections and GvHD will be evaluated. In November 2021, we enrolled our first patient in the SER-155 Phase 1b study.

Ulcerative Colitis, SER-287 and SER-301

UC is a relapsing-remitting chronic inflammatory disorder affecting the mucosal surface of the colon, leading to episodes of bloody diarrhea, urgency and mucosal inflammation (Danese and Fiocchi, 2011), which generally begins in young adulthood and endures for life. As the disease mostly affects young and middle-aged individuals, a time of peak reproductive and economic productivity, the disease leads to decreased quality of life in those affected by the condition, high morbidity, and significant health economic burden. (Ghosh and Mitchell, 2007; Kappelman et al., 2008; Rubin et al., 2014; Theede et al., 2015) The incidence of UC is rising worldwide, and the prevalence of the disease is highest in the United States, Canada, and Europe. In the United States alone, the prevalence of UC in adults is estimated to be 263 per 100,000, while in the pediatric population (age <20 years), prevalence of the disease is estimated to be 33.9 per 100,000. (Kappelman et al., 2013)

UC is characterized by recurring episodes of inflammation limited to the mucosal layer of the colon. The severity of symptoms, diarrhea associated with blood and abdominal pain, may range from mild disease to severe disease with more than 10 stools per day with severe cramps and continuous bleeding. The severity, extent, and duration of disease are also risk factors for developing colon cancer, which occurs at a rate as high as 0.5-1.0% per year, an important complication given the young age at which the disease strikes. Patients with UC also experience increased risk of CDI and primary sclerosing cholangitis, compared to the general population.

The pathogenesis of UC is unclear but thought to arise from an aberrant immune response to a change in the colonic environment in a genetically susceptible individual. The key features of UC include diffuse mucosal inflammation in a continuous pattern starting distally in the rectum to more proximal disease in the left colon to pancolitis.

Symptoms of UC include rectal bleeding, tenesmus, increased stool frequency, urgency, incontinence, fever, fatigue and malaise, which negatively impact quality of life, physical and mental health and productivity. A subset of patients has extra-intestinal manifestations ranging from iron deficiency anemia to primary sclerosing cholangitis with implications for increased morbidity. In pediatric patients, the symptoms of UC have a more damaging impact, as they affect children's growth and lead to delayed puberty. These patients also suffer from weight loss, anemia and joint symptoms and current therapy itself adversely impacts normal growth and development. (Kelsen et al., 2008). Treatment of UC with corticosteroids and immunosuppressive agents adds further medical complications to these vulnerable patients, including corticosteroid toxicity and increased risk of invasive infections and malignancy. Both environmental and genetic factors contribute to the etiology of the disease. Environmental factors may induce an ongoing immune response and inflammation in the genetically predisposed host. Efforts to identify specific environmental factors has implicated commensal bacteria or their products as key determinants of the inflammatory response in UC patients (Xavier et al., 2007). Thus, we believe SER-287 may target an "underlying cause" of UC rather than its symptoms.

Current and developing treatment alternatives and their limitations

Currently, patients with UC require life-long therapy. The goals of medical therapy are to induce and maintain clinical and endoscopic remission. Endoscopic remission is recognized as a key treatment goal since it better predicts short- and long-term clinical outcomes than symptomatic improvement alone. Attainment of these goals is generally associated with improved quality of life and decreased need for corticosteroids, and lower risk of hospitalization, colectomy, and colon cancer.

Although the etiology of UC is not fully understood, much progress has been made in the understanding of pathogenesis. Under homeostatic conditions, there is a balance between pro-inflammatory and anti-inflammatory cytokine signals mediated by epithelial and immune cells in the gastrointestinal tract. However, UC is characterized by dysregulated mucosal immune responses and translocation of inflammatory mediators of microbiological origin across a disrupted gastrointestinal barrier that may cause or perpetuate inflammation leading to chronic inflammatory disease. Migration of innate and adaptive immune cells into gut mucosal tissues is potentiated by locally produced cytokines and chemokines, and by the expression of integrins that enhance cellular trafficking into the gut lamina propria. Inhibition of the immune response, via antibodies and proteins that sequester pro-inflammatory cytokines or block the function of integrins, has been an important target of UC drug development over the past decade.

Management of UC includes medications that decrease general inflammation (e.g., 5-aminosalicylate derivatives, or 5-ASA, corticosteroids) or dampen specific components of the host immune response (e.g., immunomodulators, inhibitors of tumor necrosis factor, anti-integrin antibodies).

For mild-to-moderate disease, the 5-ASA derivatives are the standard of care for both induction and remission. 5-ASA derivatives achieve clinical remission in only 25-40% of patients during induction and approximately one-third of responders have disease flares during the first year of maintenance therapy, necessitating additional treatment interventions such as corticosteroids and immunomodulators (e.g. 6-mercaptopurine, methotrexate, azathioprine). Corticosteroids are not recommended by guideline panels for chronic therapy since these drugs are ineffective for maintaining remission and are associated with significant adverse events. Patients taking thiopurines require ongoing monitoring for hepatotoxicity, myelosuppression, and opportunistic infections, as well as counseling on the potential risk of lymphoma.

Current medical therapies for the treatment of UC suppress the immune system rather than reduce the triggers of immune activation. We believe there remains an unmet need for safer agents with novel non-immunosuppressive mechanisms of action. Moreover, alternative therapy is needed for patients with mild-to-moderate UC who experience frequent flares or are intolerant to the aminosalicylate class of medication or where there are safety concerns relating to the use of immunomodulator or steroid therapy.

SER-287

Given the modulation of the microbiome seen in UC patients, studies have explored the use of FMT to treat UC. (Angelberger et al., 2013; Colman and Rubin, 2014; Kump et al., 2013; Kunde et al., 2013; Moayyedi et al., 2015; Paramsothy et al., 2017; Costello SP et al JAMA 2019). Early reports of enhanced clinical remission and endoscopic improvement with repetitive FMT compared to placebo motivated the preclinical development and clinical testing of SER-287.

SER-287, an oral microbiome therapeutic candidate consisting of a consortium of purified Firmicutes spores, is designed to restore a healthy gastrointestinal microbiome in individuals with UC. SER-287 has been granted Fast Track Designation by the FDA for the induction and maintenance of clinical remission in adult subjects with active mild-to-moderate UC. SER-287 has been designated an Orphan Drug for pediatric UC by the FDA.

Phase 1b clinical study design

The Phase 1b clinical study was a multicenter, randomized, double-blind, placebo-controlled multiple dose study utilizing weekly or daily dosing with SER-287. We enrolled eligible subjects at approximately 20 sites in the United States. The Phase 1b

clinical study was designed to enroll adults 18 years of age and older who had mild-to-moderate UC as defined by a Total Modified Mayo score between 4 and 10, inclusive, with a modified Mayo endoscopic subscore ≥ 1, who were failing current therapies.

Patients were randomized to one of four study arms:

- Pre-conditioning with placebo for 6 days, followed by weekly dosing of SER-287 for 8 weeks
- Pre-conditioning with placebo for 6 days, followed by daily dosing with placebo for 8 weeks
- Pre-conditioning with vancomycin for 6 days, followed by daily dosing of SER-287 for 8 weeks
- Pre-conditioning with vancomycin for 6 days, followed by weekly dosing of SER-287 for 8 weeks

The primary objectives of the study were to evaluate the safety and tolerability of SER-287 compared to placebo; to compare the baseline composition of the intestinal microbiome to the composition at 8 weeks post-initiation of SER-287 or placebo; and to determine the engraftment of SER-287 bacteria into the intestinal microbial community in each of the SER-287 arms compared to the placebo arm.

The secondary objectives of the study were to determine the proportion of subjects in each of the treatment arms who at eight weeks post-initiation of treatment achieve a clinical response, complete remission, and endoscopic improvement; to assess changes in serum and fecal biomarkers from baseline throughout treatment; to determine the complement of metabolic pathways; and to compare the changes in exploratory biomarkers from mucosal biopsies and stool in each of the treatment arms from baseline through eight weeks.

This study was designed to provide evidence of safety of SER-287 compared to placebo for the UC population, describe the changes in the microbiome as a result of treatment with SER-287 and provide potential predictive biomarkers for future studies. UC is characterized by a decrease in microbial diversity and richness, with a lower prevalence of spore-forming organisms within the phylum Firmicutes. Preliminary data using repetitive enema FMT suggest that microbial interventions can affect clinical outcomes in UC, and this study evaluated whether the ecology of bacterial spores in SER-287 could correct the modulation of the microbiome in UC, increase microbial diversity and safely lead to a clinical response in UC patients with mild-to-moderate disease.

Phase 1b clinical study results

Results were analyzed using the intent to treat, or ITT, “missing equals failure” analysis and the ITT “observed case” analysis methods. The ITT “missing equals failure” analysis, included all 58 randomized subjects. For this analysis, incalculable clinical endpoints due to missing data, UC medication added due to UC flare during the treatment period and discontinuation from the trial prior to Day 48 were considered as not achieving the clinical endpoints (worst outcome). However, if the end-of-trial endoscopy at Day 48, or later, was available, and the subject did not take additional UC medication due to UC flare, then the observed data was used to define success or failure for the subject. A period of 48 days of microbiome therapy was considered sufficient treatment to estimate the outcome of clinical endpoints and was prespecified. The ITT “observed case” analysis included 53 of 58 subjects randomized, excluding those who were missing their end-of-treatment endoscopies and used the observed data to define success or failure for each subject in the analysis. A paper titled “A Phase 1b Safety Study of SER-287, a Spore-Based Microbiome Therapeutic, For Active Mild-To-Moderate Ulcerative Colitis” was published as the highlighted over article in the January 2021 print edition of the leading journal *Gastroenterology* including data analysis from the Phase 1b trial of Ser-287 demonstrating that SER-287 administration was associated with positive impacts on clinical remission, endoscopic improvement, modulation of the gastrointestinal microbiome, and a favorable safety profile.

Clinical efficacy results

In the “missing equals failure” analysis, remission showed a statistically significant improvement in the vancomycin pre-conditioning / SER-287 once-daily dosing arm as compared to the placebo/placebo daily arm: 40% (6 of 15 in SER-287) vs 0% (0 of 11 in placebo); change from placebo of 40.0% (95% confidence interval: 15.2%, 64.8%), (p-value, 0.0237). (See Figure 1).

The SER-287 weekly treatment arms also showed an improvement over placebo in both remission and endoscopic improvement but the effect was less than with the daily dosing regimen, showing a dose-response to SER-287 in these efficacy endpoints. Addition of vancomycin to the SER-287 weekly dosing regimen did not clearly alter efficacy results, although we believe this may be due to the small size of the study.

Clinical response (data not shown), showed a numeric increase in the vancomycin/SER287 daily treatment arm compared to placebo but did not reach statistical significance.

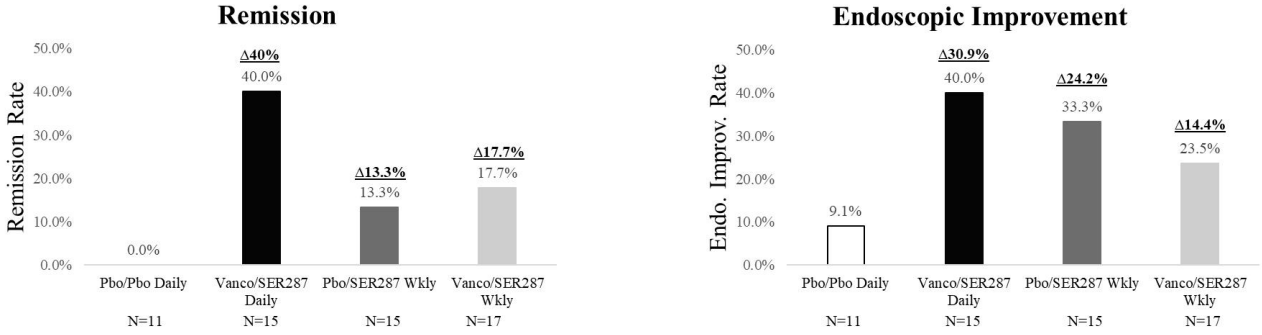


Figure 1: SER-287 Phase 1b Clinical Study Efficacy Data – Missing Equals Failure

Legend: Δ = change from placebo; Remission was defined as a Total Modified Mayo score of less than or equal to 2, and an endoscopic sub-score of 0 or 1; Endoscopic improvement was defined as a decrease in endoscopic sub score of greater than or equal to 1. Endoscopy measures were analyzed by a Central Reader.

Clinical Safety Results

The primary safety objective (short-term safety) was to evaluate the safety and tolerability of SER-287 in adults with active mild-to-moderate UC up to 92 days after randomization as determined by clinical and laboratory safety assessments.

The treatment-emergent adverse events, or TEAEs, were balanced across all the treatment arms. No drug-related serious adverse events, or SAEs, were reported. All adverse events, or AEs, were considered mild to moderate in intensity. Gastrointestinal, or GI, disorders had the greatest number of AEs compared to other system organ classes, with the most efficacious treatment arm (vancomycin/SER-287 daily) experiencing the lowest percentage of GI AEs.

SER-287 was observed to be well-tolerated in all treatment arms, showing a safety profile consistent with the placebo arm. The safety profile, when evaluating GI AEs, showed an improvement in the vancomycin/SER-287 treatment arm compared to vancomycin/placebo and the vancomycin/SER-287 weekly treatment arms.

A paper titled “A Phase 1b Safety Study of SER-287, a Spore-Based Microbiome Therapeutic, For Active Mild-To-Moderate Ulcerative Colitis” was published as the highlighted over article in the January 2021 print edition of the leading journal *Gastroenterology* including data analysis from the Phase 1b trial of Ser-287 demonstrating that SER-287 administration was associated with positive impacts on clinical remission, endoscopic improvement, modulation of the gastrointestinal microbiome, and a favorable tolerability profile

Microbiome results showed engraftment of SER-287-derived bacterial species in patients pre-conditioned with vancomycin who received SER-287. The degree of SER-287 engraftment, as measured by the number of detectable SER-287-derived bacterial species, increased in a dose-dependent manner, with daily dosing providing the most rapid and robust change in patients’ microbiome. Engraftment was maintained during the entire dosing period and was observed four weeks after the last dose of SER-287 was administered. Thus, engraftment was durable. Changes in the composition of the GI microbiome were associated with clinical remission and further associated with changes in stool metabolite and intestinal biopsy gene expression signatures associated with inflammation and immune modulation. Vancomycin pre-conditioning, as compared to placebo pre-conditioning, led to an immediate reduction of microbiome diversity followed by rapid and robust engraftment of SER-287-derived bacterial species. These data suggest that vancomycin pre-conditioning opens ecological niches for SER-287 engraftment in the human microbiome of patients with UC.

Phase 2b clinical study design

The Phase 2b study, initiated in December 2018, was a three-arm placebo-controlled trial of approximately 200 patients with active mild-to-moderate UC. Two groups of patients received different doses of SER-287, both following pre-conditioning with a short course of oral vancomycin. A third study arm received placebo. The study’s primary endpoint evaluated clinical remission measured after 10 weeks of SER-287 administration. Endoscopic improvement were measured as a secondary efficacy measure.

Phase 2b clinical study results

In July 2021, we announced topline results from the Phase 2b study evaluating SER-287 in patients with mild-to-moderate UC. The study did not meet its primary endpoint of improving clinical remission rates compared to placebo. The primary objective of the induction portion of the Phase 2b study was to evaluate the safety and efficacy of SER-287, after 10 weeks of induction dosing (following vancomycin pre-conditioning) in achieving clinical remission in participants with mild-to-moderate UC. The trial was a randomized, placebo controlled, double blind, parallel group multicenter study which enrolled 203 UC patients at approximately 100 sites throughout the U.S. and Canada. Dosing was explored in two SER-287 cohorts (full induction dose and step-down induction dose) versus placebo and patients were randomized according to a 1:1:1 ratio. Clinical remission was analyzed and defined by a 3-component modified Mayo Score. No statistically significant differences were observed in absolute clinical remission rates between the three treatment arms (10.3% for the full induction dose, n=68 and 10.6% for the step-down induction dose, n=66 versus 11.6% for placebo, n=69). There were also no statistically significant differences observed across the three treatment groups for endoscopic improvement, endoscopic remission or symptomatic remission.

Both dosing regimens of SER-287 were generally well tolerated. Treatment emergent adverse events, or AEs, were observed in 67.6%, 46.2% and 50.7% of subjects in the induction dose, step-down dose (both of which included six days of oral vancomycin preconditioning) and placebo treatment arms, respectively. The majority of observed AEs were mild or moderate in severity. The most commonly observed AEs were UC, diarrhea, nausea and abdominal distension. Four participants on active treatment reported serious treatment emergent adverse events (worsening UC, colonic dysplasia, congestive heart failure with decreased hemoglobin, and appendicitis), as did one on placebo (worsening UC).

Given the lack of a clinical efficacy signal identified in the Phase 2b study, we have closed the open label and maintenance portions of the study.

In December 2021, we completed preliminary microbiome drug pharmacology analyses from the Phase 2b study that demonstrated the successful engraftment of SER-287 bacterial species. Based on the SER-287 Phase 2b microbiome data analyses, engraftment of SER-287 bacteria, measured as the median number of bacteria observed across patients post treatment, was statistically significant in patients receiving SER-287 versus placebo ($p \leq 0.001$ at all timepoints). The magnitude and kinetics of engraftment were comparable to our Phase 1b study. However, unlike the Phase 1b study, anticipated changes in disease-relevant metabolites post-administration with SER-287 in the Phase 2b study were not observed. Analysis of the genomic and metabolomic data characterizing the microbiome of SER-287 study participants at baseline and post dosing suggest potential biomarkers for inclusion of targeted patient subpopulations in future development efforts.

We continue to conduct analyses of data from our SER-287 and SER-301 clinical stage programs to inform next steps for further development.

SER-301

SER-301 is an investigational, oral, microbiome therapeutic candidate comprised of a consortium of cultivated bacteria for the treatment of mild-to-moderate UC. SER-301 is a consortium of cultivated bacteria designed using our reverse translational discovery platform that incorporates analysis of microbiome biomarkers from human clinical data and preclinical assessments using human cell-based assays and in *vitro/ex vivo* and *in vivo* disease models. SER-301 is formulated for oral delivery. The design of SER-301 incorporates insights obtained from the SER-287 Phase 1b clinical and microbiome results, as well as from our clinical portfolio more broadly, and additional functional data from preclinical assessments, in an effort to optimize desired pharmacological properties.

SER-301 is designed to reduce induction of pro-inflammatory activity, improve epithelial barrier integrity and TNF-α driven inflammation in intestinal epithelial cells, or IECs, and modulate UC-relevant anti-inflammatory, innate and adaptive immune pathways. SER-301 is being produced by our advanced fermentation, formulation and delivery platforms. It includes strains delivered in spore form, as well as strains fermented in non-spore (vegetative) form and delivered using enterically-protected technology designed to release in the colon.

Phase 1b clinical study design

The SER-301 Phase 1b study is being conducted in Australia and New Zealand in subjects with mild-to-moderate UC and is designed to include approximately 65 patients distributed across two cohorts. A first open-label cohort of 15 subjects evaluated safety, tolerability and pharmacokinetics (PK), as measured by bacterial engraftment. In the second cohort, 50 subjects will be randomized to receive either SER-301 or placebo, with a 3:2 randomization, respectively. The study utilizes an independent blinded central reader for the endoscopic component. The objectives for this cohort are to evaluate safety and PK, clinical remission, and other measures of drug pharmacology and efficacy will be evaluated as secondary endpoints. In November 2020, we enrolled the first patient in the SER-301 Phase 1b study.

Phase 1b clinical study results - Cohort 1

We have completed preliminary analysis of data from the first cohort of the SER-301 Phase 1b study. Evaluation of the first cohort data by an independent Data Safety Monitoring Board indicated that it would be safe to proceed to the placebo-controlled second cohort. While efficacy was not a defined endpoint in the first cohort, evaluation of clinical outcome data collected as part of the study indicated that no subjects in the first cohort achieved clinical remission as defined by the FDA using the Three-Component

Modified Mayo Score after 10 weeks of treatment, though there were improvements in one or more individual components (endoscopic, stool frequency and rectal bleeding subscores) in some patients. Strains in SER-301 were observed to engraft in subjects across the trial period with the number of engrafting strains exceeding expectations at multiple sampling time points. A dual formulation was evaluated in the first cohort and the extent of engraftment across subjects was correlated with whether bacteria were formulated as bacterial spores versus vegetative strains; the former demonstrating stronger engraftment across all patients.

Based on the assessment of metabolomic data, SER-301 demonstrated pharmacological properties consistent with its design and led to baseline-dependent modulation of the metabolic landscape in the gastrointestinal tract of patients treated; changes were observed in short-chain and medium-chain fatty acids, tryptophan-derived metabolites, bile acids, and other microbe-associated metabolites, as well as host metabolites associated with a non-disease state. These SER-301 metabolomic results were encouraging compared with the results observed in the SER-287 Phase 2b study, in which the metabolic changes were not observed in general across subjects administered with SER-287. Additionally, changes in disease-relevant metabolites in SER-301 were observed to be greater in a definable subpopulation of patients.

The degree of metabolic changes observed following SER-301 administration appeared to be dependent on the baseline metabolic profile of the study subjects, providing support for the potential for microbiome therapeutics to be developed in biomarker-identified UC patient subpopulations.

We continue to conduct analyses of data from our SER-287 and SER-301 UC clinical stage programs to inform next steps for further development.

Other Programs

SER-401

In March 2021, we announced that we, in collaboration with study partners, The Parker Institute for Cancer Immunotherapy and The University of Texas MD Anderson Cancer Center, voluntarily discontinued further enrollment of our study evaluating the safety and drug activity of SER-401 or fecal microbiota transplant, or FMT, in combination with nivolumab in patients with metastatic melanoma.

A preliminary analysis of results from 10 subjects who received either SER-401 or placebo in combination with nivolumab indicated that SER-401 was generally well-tolerated. There were no patients enrolled in the FMT portion of the study. Subjects currently enrolled in the study will complete the study protocol. Given challenges in enrollment due to the COVID-19 pandemic, subsequent anticipated time to study completion, and progress in our preclinical oncology pipeline, we have decided to deprioritize further development of SER-401. We will continue to advance our research and development efforts in cancer, applying learnings from the SER-401 trial.

Manufacturing

Donor-derived product candidates

SER-109 is a purified consortium of Firmicute spores produced through a process of separation and purification from a natural human stool source, obtained from qualified, highly screened donors. The donor raw material is collected in a controlled setting, under a protocol that is designed to ensure that donors meet appropriate qualification criteria.

Donors are required to be in good health, and to possess a medical history that minimizes the risk of exposure to and transmission of an infectious disease. Donors are tested for infectious agents and screened for GI and other relevant health factors. Donors are monitored for health status changes on an ongoing basis throughout the donation period. At periodic intervals, and at the end of the donation period, the qualification assessment is repeated to help ensure the donor has maintained their health status. After successful completion of a periodic or exit screening, donations are released for use in manufacturing.

We initially process the donor material in our in-house Cambridge manufacturing facility, and then transfer the process intermediate to our partner CMO, GenIbet (acquired by Recipharm in February 2022), to further isolate and concentrate SER-109 for finishing to the oral capsule dosage form. The manufacturing process includes processes to inactivate and clear potential adventitious agents, to help ensure product safety. The purified drug substance is tested for identity, potency and purity, and subsequently formulated into drug product where it is again tested for identity, potency, purity, and pharmaceutical properties. The final drug product oral dosage form is four capsules daily for 3-days. Steps are specifically built into the process to remove and kill non-spore microbes. We have conducted validation studies demonstrating the ability of the process to inactivate and clear any potential extraneous pathogens of concern, and we believe we have sufficient data from these studies to support product registration. If approved, we anticipate that we will be able to produce a sufficient commercial supply of SER-109 to meet estimated demand in the United States using donations from a modest number of donors.

Commercial product supply for the initial phase of U.S. commercial launch is being produced at our Cambridge manufacturing facility and further processed at GenIbet. In November 2021, we entered into a collaboration with Bacthera to manufacture SER-109 to expand upon our existing capabilities for commercial product supply to meet anticipated demand in later years. Under the terms of

the agreement, Bacthera will construct a dedicated full-scale production suite for us at Bacthera's Microbiome Center of Excellence in Visp, Switzerland, which is currently under construction, and provide manufacturing services for SER-109.

Cultivated product candidates

The production of live bacterial products is highly specialized. Owing to their hardiness and environmental persistence, production of aerobic and anaerobic vegetative bacteria, as well as spore-forming organisms, poses unique considerations for product, personnel, and facility design, operation, quality assurance and quality control. Manufacturing activities with spores are subject to specialized regulations. We expect that a typical commercial fermentation will yield on the order of hundreds or thousands of doses per liter depending on the product and its composition. Additionally, because a given total dose contains multiple strains, the per-strain requirements for production may be even lower. As a result, we believe the relatively high productivity of our manufacturing processes relative to the dose level will enable production scales for both clinical and commercial supply to be modest by traditional industry standards for biologics and vaccine manufacturing.

We have developed supply chains for producing and testing materials to ensure the availability of future clinical trial supplies. Our development processes are designed to ensure that the raw materials, process technologies and analytical tests we use are scalable and transferable to a cGMP manufacturing environment. These include the following core elements:

- *Fermentation.* We are using microscale screening to optimize culture of the bacterial strains of interest in our current and foreseeable fermentation-based product candidates. These screens are designed to identify the fermentation platform that is best-suited for optimization and scale-up of the strains. Small-scale fermentation systems (0.1 L to 50 L) enable the optimization of a wide variety of culture conditions and have been demonstrated to be scalable to larger fermentation processes and enable technology transfer to clinical and final manufacturing sites. We employ platform fermentation processes as starting points for cGMP production processes and develop strain specific processes as required. To develop master cell banks, working cell banks, and bulk drug substance for commercial product, we are using bacterial strains that each originate from a unique research cell bank precursor, so we expect the research cell banks and final drug product should be genetically and physiologically similar.
- *Purification.* Similar to fermentation, we believe small-scale purification operations are available for assessing large-scale cGMP manufacturing of live cells, and to quickly assess downstream process yield, quality and robustness. Our products in development are predominantly oral dosage forms containing live bacteria, hence purification is typically less complex than for parenteral biologics such as monoclonal antibodies that must separate highly similar components from the culturing process. Separation of viable microbes from soluble fermentation broth components is typically much simpler by comparison.
- *Formulation.* Our microbiome therapeutic candidates are combinations of bacteria and can be administered by a number of methods and by different routes. Where possible, our product formulation development is focused on oral delivery for patient convenience. The primary goal in developing a formulation is to deliver bacteria to the intended location in a condition where they are able to replicate and modulate the microbiome. Formulation development generally uses approved excipients and preservatives with pharmaceutical industry precedent, and will include screening of liquid, solid, and suspension formulations to maximize the opportunity for extended stability with minimal cold-chain requirements. Dosage forms for oral products may be liquid- or powder-filled capsules, tablets, sachets, or liquid containers.
- *Analytical.* We are addressing quality control requirements for our microbiome therapeutic candidates using proprietary microbiological, chemical, biochemical, and molecular sequence-based testing schemes. We have available and are further developing quality control, environmental monitoring and in-process analytical tools that can quantitatively measure the composition of spore, vegetative microbe and spore/vegetative combinations, which we believe enable a wide variety of drug products to be manufactured. Throughout the bioprocess and formulation development platform we use and will expand on quantitative analytics to assess the identity, potency and purity of the final product.

We currently have a 10,000 square foot cGMP manufacturing facility at our headquarters where we conduct cGMP manufacture of therapeutic candidates to support drug substance and drug product for early phase and small-scale clinical supplies and with the ability to perform both drug substance and drug product manufacturing for early and late-phase clinical development and at larger scales of operation. We may establish further manufacturing facilities that will serve late-phase clinical and commercial supply for our product candidates. We may do this by expanding our current facilities, or by purchasing or building additional facilities. We also use contract manufacturing and testing organizations to supplement our internal capacity.

Material Agreements

Collaboration and Manufacturing Agreements

Collaboration and License Agreement with Société des Produits Nestlé S.A. (Nestlé)

In January 2016, we entered into the Collaboration and License Agreement, or the 2016 License Agreement, with Nestec, Ltd., which was succeeded in interest by Société des Produits Nestlé S.A., or together with NHSc Pharma Partners, Nestlé, for the development and commercialization of certain product candidates in development for the treatment and management of CDI and IBD, including UC and Crohn's disease. The 2016 License Agreement will support the development of our portfolio of products for CDI and IBD in markets outside of the United States and Canada, or the 2016 Licensed Territory.

License Agreement with NHSc Pharma Partners (Nestlé)

In July 2021, we entered into a license agreement, or the 2021 License Agreement, with NHSc Pharma Partners, or, together with Société des Produits Nestlé S.A., Nestlé. Under the terms of the 2021 License Agreement, we granted Nestlé a co-exclusive, sublicensable (under certain circumstances) license to develop, commercialize and conduct medical affairs activities for (i) therapeutic products based on our microbiome technology (including our SER-109 product candidate) that are developed by us or on our behalf for the treatment of CDI and recurrent CDI, as well as any other indications pursued for the products upon mutual agreement of the parties, or the 2021 Field in the United States and Canada, or the 2021 Licensed Territory, and (ii) our SER-109 product candidate and any improvements and modifications thereto developed pursuant to the terms of the 2021 License Agreement, or the 2021 Collaboration Products for any indications in the 2021 Licensed Territory. We are responsible for completing development of SER-109 in the 2021 Field in the United States until first regulatory approval for SER-109 is obtained.

Bacthera Long Term Manufacturing Agreement

In November 2021, we entered into a Long Term Manufacturing Agreement, or the Bacthera Agreement, with BacThera AG, or Bacthera, a joint venture between Chr. Hansen and a Lonza Group affiliate. The Bacthera Agreement governs the general terms under which Bacthera, or one of its affiliates, will (i) construct a dedicated full-scale production suite for us at Bacthera's Microbiome Center of Excellence in Visp, Switzerland, which is currently under construction; and (ii) provide manufacturing services to us for our SER-109 product and, if agreed by the parties, SER-287 product.

AstraZeneca Research Collaboration and Option Agreement

In March 2019, we entered into a Research Collaboration and Option Agreement, or the Research Agreement, with MedImmune, LLC, a wholly owned subsidiary of AstraZeneca Inc., or AstraZeneca to conduct certain research and development activities with the goal of advancing the mechanistic understanding of the microbiome in augmenting the efficacy of cancer immunotherapy, including potential synergy with AstraZeneca compounds in accordance with a mutually agreed research plan. AstraZeneca bore all costs of conducting its activities under the Research Agreement and reimbursed us for certain of our costs incurred under the Research Agreement and paid us a total of $20.0 million in three equal installments, the first of which we received in April 2019, the second of which we received in December 2019 and third of which we received in January 2021.

Indebtedness

Loan and Security Agreement with Hercules

In October 2019, we entered into a loan and security agreement with Hercules, pursuant to which a term loan in an aggregate principal amount of up to $50.0 million, or the Original Credit Facility, was available to us in three tranches. We received the first tranche of $25.0 million upon signing the agreement on October 29, 2019. We did not meet the milestone requirements for the second tranche under the Original Credit Facility, and as such, the additional amount up to $12.5 million is not available for us to borrow. We elected not to borrow the third tranche of $12.5 million, which was available upon Hercules' approval until June 30, 2021.

In April 2020, we entered into an amendment to the loan and security agreement with Hercules, or the First Amendment, permitting us to enter into a promissory note under the Paycheck Protection Program of the Coronavirus Aid, Relief and Economic Stability Act.

In February 2022, we entered into a second amendment to the loan and security agreement with Hercules, or the Second Amendment, which amended the Original Credit Facility. Pursuant to the Second Amendment, term loans in an aggregate principal amount of up to $100.0 million, or the New Credit Facility, have become available to us in five tranches subject to certain terms and conditions: (i) the first tranche in an aggregate principal amount of $25.0 million that is outstanding as of the February 24, 2022 effective date, or the Effective Date, (ii) the second tranche in an aggregate principal amount of $12.5 million that has been advanced to the Company and is outstanding as of the Effective Date, (iii) the third tranche in an aggregate principal amount of $12.5 million that has been advanced to the Company and is outstanding as of the Effective Date, (iv) the fourth tranche in an aggregate principal amount of $25.0 million available upon satisfaction of certain conditions, including the approval by the U.S. Food and Drug Administration of a biologics license application in respect of SER-109 by no later than December 15, 2023, and (v) the fifth tranche in an aggregate principal amount of up to $25.0 million that is available through the amortization date upon satisfaction of certain conditions, including the lenders' investment committee approval.

For a further description of our material agreements, see “Management’s Discussion and Analysis of Financial Condition and Results of Operations – Liquidity and Capital Resources" in Part II, Item 7 of this Annual Report on Form 10-K.

Intellectual Property

We strive to protect the proprietary technology that is important to our business, including seeking and, if granted, maintaining patents intended to cover our product candidates and compositions, their methods of use and processes for their manufacture and any other aspects of inventions that are commercially important to the development of our business. We also utilize regulatory exclusivity as well as trade secrets to protect aspects of our business.

We plan to continue to expand our intellectual property estate by filing patent applications directed to compositions, methods of treatment, methods of manufacture and methods for patient selection created or identified from our ongoing development of our product candidates. Our success will depend on our ability to obtain and maintain patent and other proprietary protection for commercially important technology, inventions and know-how related to our business, defend and enforce any patents that we may obtain, preserve the confidentiality of our trade secrets and operate without infringing the valid and enforceable patents and proprietary rights of third parties. We also rely on know-how and continuing technological innovation to develop and maintain our proprietary position and, in the future, may rely on or leverage in-licensing opportunities. We seek to obtain domestic and international patent protection, and endeavor to promptly file patent applications for new commercially valuable inventions.

The patent positions of biopharmaceutical companies like us are generally uncertain and involve complex legal, scientific and factual questions. In addition, the coverage claimed in a patent may be challenged in courts after issuance. Moreover, many jurisdictions permit third parties to challenge issued patents in administrative proceedings, which may result in further narrowing or even cancellation of patent claims. We cannot predict whether the patent applications we are currently pursuing will issue as patents in any particular jurisdiction or at all, whether the claims of any patent applications, should they issue, will cover our product candidates, or whether the claims of any issued patents will provide sufficient protection from competitors or otherwise provide any competitive advantage.

Because patent applications in the United States and certain other jurisdictions are maintained in secrecy for 18 months or potentially even longer, and because publication of discoveries in the scientific or patent literature often lags behind actual discoveries and patent application filings, we cannot be certain of the priority of inventions covered by pending patent applications. Accordingly, we may not have been the first to invent the subject matter disclosed in some of our patent applications or the first to file patent applications covering such subject matter, and we may have to participate in interference proceedings or derivation proceedings declared by the United States Patent and Trademark Office, or USPTO, to determine priority of invention.

Our patent portfolio includes issued U.S. patents and patent applications in various stages of prosecution, including ex-U.S. international counterparts. We believe that issued claims will provide protection for our microbiome therapeutic candidates.

Patent Term

The base term of a U.S. patent is 20 years from the filing date of the earliest-filed non-provisional, patent application from which the patent claims priority. The term of a U.S. patent can be lengthened by patent term adjustment, which compensates the owner of the patent for administrative delays at the USPTO. In some cases, the term of a U.S. patent is shortened by terminal disclaimer that reduces its term to that of an earlier-expiring patent.

The term of a U.S. patent may be eligible for patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Act, to account for at least some of the time the drug is under development and regulatory review after the patent is granted. With regard to a drug for which FDA approval is the first permitted marketing of the active ingredient, the Hatch-Waxman Act allows for extension of the term of one U.S. patent that includes at least one claim covering the composition of matter of such an FDA-approved drug, an FDA-approved method of treatment using the drug and/or a method of manufacturing the FDA-approved drug. The extended patent term cannot exceed the shorter of five years beyond the non-extended expiration of the patent or fourteen years from the date of the FDA approval of the drug, and a patent cannot be extended more than once or for more than a single product. During the period of extension, if granted, the scope of exclusivity is limited to the approved product for approved uses. Some foreign jurisdictions, including Europe and Japan, have analogous patent term extension provisions, which allow for extension of the term of a patent that covers a drug approved by the applicable foreign regulatory agency. In the future, if and when our product candidates receive FDA approval, we expect to apply, if appropriate, for patent term extension on patents covering those product candidates, their methods of use and/or methods of manufacture.

Trade Secrets

In addition to patents, we rely on trade secrets and know-how to develop and maintain our competitive position. We typically utilize trade secrets to protect aspects of our business. We protect trade secrets and know-how by establishing confidentiality agreements and invention assignment agreements with our employees, consultants, scientific advisors, contractors and collaborators. These agreements provide that all confidential information developed or made known during the course of an individual or entities’ relationship with us must be kept confidential during and after the relationship. These agreements also provide that all inventions

resulting from work performed for us or relating to our business and conceived or completed during the period of employment or assignment, as applicable, shall be our exclusive property. In addition, we take other appropriate precautions, such as physical and technological security measures, to guard against misappropriation of our proprietary information by third parties.

Competition

The development and commercialization of new drug and biologic products is highly competitive and is characterized by rapid and substantial technological development and product innovations. We face competition with respect to our current product candidates and will face competition with respect to any product candidates that we may seek to develop or commercialize in the future from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide. We are aware of a number of large pharmaceutical and biotechnology companies, as well as smaller, early-stage companies, that are pursuing the development of products, including microbiome therapeutics, and disease indications we are targeting. Potential competitors also include academic institutions, government agencies and other public and private research organizations that conduct research, seek patent protection and establish collaborative arrangements for research, development, manufacturing and commercialization.

Many of the companies against which we are competing or against which we may compete in the future have significantly greater financial resources, established presence in the market and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors.

These third parties compete with us in recruiting and retaining qualified scientific, clinical, manufacturing sales and marketing and management personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

The key competitive factors affecting the success of the product candidates that we develop, if approved, are likely to be their efficacy, safety, convenience, price, the level of competition and the availability of reimbursement from government and other third-party payors.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market, especially for any competitor developing a microbiome therapeutic which will likely share our same regulatory approval requirements. In addition, our ability to compete may be affected in many cases by insurers or other third-party payors seeking to encourage the use of lower cost products.

Government Regulation

The FDA and other regulatory authorities at federal, state and local levels, as well as in foreign countries, extensively regulate, among other things, the research, development, testing, manufacture, quality control, import, export, safety, effectiveness, labeling, packaging, storage, distribution, record keeping, approval, advertising, promotion, marketing, post-approval monitoring and post-approval reporting of drugs and biologics such as those we are developing. We, along with our contract manufacturers, will be required to navigate the various preclinical, clinical and commercial approval requirements of the governing regulatory authorities of the countries in which we wish to conduct studies or seek approval for our product candidates. The process of obtaining regulatory approvals and ensuring subsequent compliance with appropriate federal, state, local and foreign statutes and regulations requires the expenditure of substantial time and financial resources.

In the United States, the FDA regulates drug and biologic products under the Federal Food, Drug and Cosmetic Act, its implementing regulations and other laws, including, in the case of biologics, the Public Health Service Act. Our product candidates are subject to regulation by the FDA as biologics. Biologics require the submission of a BLA and approval by the FDA before being marketed in the United States.

The process required by the FDA before our biologic product candidates may be marketed in the United States generally involves the following:

- completion of preclinical laboratory tests and animal studies performed in accordance with the FDA's good laboratory practice, or GLP, regulations;
- submission to the FDA of an IND, which must become effective before clinical trials in the United States may begin;
- approval by an institutional review board, or IRB, or ethics committee at each clinical site before a trial is commenced;

- performance of adequate and well-controlled human clinical trials to establish the safety, purity and potency of the product candidate for each proposed indication, conducted in accordance with the FDA's good clinical practice, or GCP, regulations;
- preparation and submission to the FDA of a BLA after completion of all pivotal trials;
- satisfactory completion of an FDA Advisory Committee review, if applicable;
- determination by FDA within 60 days of its receipt of a BLA to file the application for review;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the product is produced to assess compliance with cGMP regulations, and to assure that the facilities, methods and controls are adequate to preserve the biological product's continued safety, purity and potency, and of selected clinical investigation sites to assess compliance with GCPs; and
- FDA review and approval of the BLA prior to any commercial marketing, sale or shipment of the product.

The testing and approval process requires substantial time, effort and financial resources, and we cannot be certain that any approvals for our product candidates will be granted on a timely basis, if at all.

Preclinical and Clinical Trials

Once a product candidate is identified for development, it enters the preclinical testing stage. Preclinical studies include laboratory evaluations of drug chemistry, formulation and stability, as well as studies to evaluate toxicity in animals, which must be conducted in accordance with GLP requirements. The results of the preclinical studies, together with manufacturing information and analytical data, are submitted to the FDA as part of an IND. An IND is a request for authorization from the FDA to administer an investigational new drug to humans. An IND must become effective before human clinical trials may begin. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day time period, raises concerns or questions about the conduct of the clinical trial, including concerns that human research subjects will be exposed to unreasonable health risks. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. Submission of an IND may result in the FDA not allowing clinical trials to commence or not allowing clinical trials to commence on the terms originally specified in the IND. A separate submission to an existing IND must also be made for each successive clinical trial conducted during product development, and the FDA must grant permission, either explicitly or implicitly by not objecting, before each clinical trial can begin.

Clinical trials involve the administration of the product candidate to human subjects under the supervision of qualified investigators in accordance with GCPs, which include the requirement that all research subjects provide their informed consent for their participation in any clinical study. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial and the parameters and criteria to be used in monitoring safety and evaluating effectiveness. Each protocol must be submitted to the FDA as part of the IND. While the IND is active, progress reports summarizing the results of the clinical trials and nonclinical studies performed since the last progress report, among other information, must be submitted at least annually to the FDA, and written IND safety reports must be submitted to the FDA and investigators for serious and unexpected suspected adverse events, findings from other studies suggesting a significant risk to humans exposed to the drug, findings from animal or in vitro testing suggesting a significant risk to humans exposed to the drug, and any clinically important increased rate of a serious suspected adverse reaction compared to that listed in the protocol or investigator brochure.

An independent institutional review board, or IRB, for each investigator site proposing to participate in a clinical trial must also review and approve the clinical trial before it can begin at that site, and the IRB must monitor the clinical trial until it is completed. Some studies also include oversight by an independent group of qualified experts organized by the clinical study sponsor, known as a data safety monitoring board, which provides authorization for whether or not a study may move forward at designated check points based on access to certain data from the study and may halt the clinical trial if it determines that there is an unacceptable safety risk for subjects or other grounds, such as no demonstration of efficacy. The FDA, the IRB, or the sponsor may suspend or discontinue a clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk. There are also requirements governing the reporting of ongoing clinical studies and clinical study results to public registries.

For purposes of BLA approval, clinical trials are typically conducted in three sequential phases, which may overlap or be combined.

- *Phase 1* — The investigational product is initially introduced into healthy human subjects or patients with the target disease or condition. These studies are typically designed to test the safety, dosage tolerance, absorption, metabolism and distribution of the investigational product in humans, the side effects associated with increasing doses, and, if possible, to gain early evidence on effectiveness.
- *Phase 2* — The investigational product is typically administered to a limited patient population with a specified disease or condition to evaluate the preliminary efficacy, optimal dosages and dosing schedule and to identify possible adverse side effects and safety risks.

- *Phase 3* — The investigational product is administered to an expanded patient population to further evaluate dosage, to provide statistically significant evidence of clinical efficacy and to further test for safety, generally at multiple geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the investigational product and to provide an adequate basis for product approval.

In some cases, the FDA may condition approval of a BLA on the sponsor's agreement to conduct additional clinical trials to further assess the biologic's safety and effectiveness after BLA approval. Such post-approval clinical trials are typically referred to as Phase 4 clinical trials.

Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the chemistry and physical characteristics of the biologic and finalize a process for manufacturing the biologic in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and manufacturers must develop, among other things, methods for testing the identity, strength, quality and purity of the final biological product. Additionally, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life.

BLA Submission and FDA Review

The results of preclinical studies and clinical trials, together with other detailed information, including extensive manufacturing information and information on the composition of the biologic, are submitted to the FDA in the form of a BLA requesting approval to market the biologic for one or more specified indications. The BLA must include all relevant data available from preclinical and clinical studies, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's chemistry, manufacturing, controls, and proposed labeling, among other things. Data can come from company-sponsored clinical studies intended to test the safety and effectiveness of a use of the product, or from a number of alternative sources, including studies initiated by independent investigators. The submission of a BLA requires payment of a substantial user fee unless a waiver is granted or exemption applies.

Each BLA submitted to the FDA is reviewed for administrative completeness and reviewability within 60 days of the FDA's receipt of the application. If the BLA is found to be complete, the FDA will file the BLA, triggering a full review of the application. The FDA may refuse to file any BLA that it deems incomplete or not properly reviewable at the time of submission. In this event, the BLA must be resubmitted with the additional information.

Once a BLA has been accepted for filing, the FDA's goal is to review standard applications within ten months after the filing date, or, if the application qualifies for priority review, six months after the FDA accepts the application for filing, but the overall timeframe is often extended by FDA requests for additional information or clarification. The FDA reviews a BLA to determine, among other things, whether the biological product is safe, pure and potent and whether the facility or facilities in which it is manufactured meet standards designed to assure the product's continued safety, purity and potency. The FDA may also refer the application to an Advisory Committee for review, evaluation, and recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations.

Before approving a BLA, the FDA will inspect the facility or the facilities at which the biologic product is manufactured and will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP and adequate to assure consistent production of the product within required specifications. Additionally, before approving a BLA, the FDA may inspect one or more clinical sites to assure that such trials were conducted in compliance with GCP. If the FDA determines that the application, manufacturing process or manufacturing facilities are not acceptable, it will outline the deficiencies in the submission and often will request additional testing or information. Notwithstanding the submission of any requested additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

After the FDA evaluates a BLA and conducts inspections of manufacturing facilities where the investigational product and/or its drug substance will be produced, the FDA may issue an approval letter or a Complete Response Letter, or CRL. An approval letter authorizes commercial marketing of the product with specific prescribing information for specific indications. A CRL will describe all of the deficiencies that the FDA has identified in the BLA, except that where the FDA determines that the data supporting the application are inadequate to support approval, the FDA may issue the CRL without first conducting required inspections, testing submitted product lots, and/or reviewing proposed labeling. In issuing the CRL, the FDA may recommend actions that the applicant might take to place the BLA in condition for approval, including requests for additional information or clarification. The FDA may delay or refuse approval of a BLA if applicable regulatory criteria are not satisfied, require additional testing or information, and/or require post-marketing testing and surveillance to monitor safety or efficacy of a product.

If regulatory approval of a product is granted, such approval will be granted for particular indications and may entail limitations on the indicated uses for which such product may be marketed. For example, the FDA may approve the BLA with a Risk Evaluation and Mitigation Strategy, or REMS, to ensure the benefits of the product outweigh its risks. A REMS is a safety strategy implemented to manage a known or potential serious risk associated with a product and to enable patients to have continued access to such medicines by managing their safe use, and could include medication guides, physician communication plans, or elements to assure

safe use, such as restricted distribution methods, patient registries and other risk minimization tools. The FDA also may condition approval on, among other things, changes to proposed labeling or the development of adequate controls and specifications. Once approved, the FDA may withdraw the product approval if compliance with pre- and post-marketing requirements is not maintained or if problems occur after the product reaches the marketplace. The FDA may require one or more Phase 4 post-market studies and surveillance to further assess and monitor the product's safety and effectiveness after commercialization and may limit further marketing of the product based on the results of these post-marketing studies.

Expedited Development and Review Programs

The FDA maintains several programs intended to facilitate and expedite development and review of new biologics designed to address unmet medical needs in the treatment of serious or life- threatening diseases or conditions. These programs include Fast Track designation, Breakthrough Therapy designation, Priority Review designation and Accelerated Approval, and the purpose of these programs is to expedite the development and review of qualifying product candidates.

A new biologic is eligible for Fast Track designation if it is intended to treat a serious or life- threatening disease or condition and demonstrates the potential to address unmet medical needs for such disease or condition. Fast Track designation provides increased opportunities for sponsor meetings with the FDA during preclinical and clinical development, in addition to the potential for rolling review, meaning that the agency may review portions of the marketing application before the sponsor submits the complete application, if the sponsor provides a schedule for the submission of the sections of the BLA, the FDA agrees to accept sections of the BLA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the BLA. Product candidates receiving Fast Track status may also be eligible for Priority Review, if the relevant criteria are met.

In addition, a biologic product candidate may be eligible for Breakthrough Therapy designation if it is intended to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the product candidate may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. Breakthrough Therapy designation provides all the features of Fast Track designation in addition to intensive guidance on an efficient development program beginning as early as Phase 1, and FDA organizational commitment to expedited development, including involvement of senior managers and experienced review staff in a cross-disciplinary review, where appropriate.

Any product candidate submitted to the FDA for approval, including a product candidate with Fast Track or Breakthrough Therapy designation, may also be eligible for additional FDA programs intended to expedite the review process, including Priority Review designation and accelerated approval. A BLA is eligible for Priority Review if the product candidate has the potential to provide a significant improvement in safety or effectiveness in the treatment, diagnosis or prevention of a serious disease or condition. Additionally, product candidates are eligible for accelerated approval if they can be shown to have an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or an effect on a clinical endpoint that can be measured earlier than an effect on irreversible morbidity or mortality which is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. Accelerated approval is usually contingent on a sponsor's agreement to conduct additional post-approval studies to verify and describe the product's clinical benefit. Products receiving accelerated approval may be subject to expedited withdrawal procedures if the sponsor fails to conduct the required post-marketing studies or if such studies fail to verify the predicted clinical benefit. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product.

Fast Track designation, Breakthrough Therapy designation, Priority Review designation and Accelerated Approval do not change the standards for approval but may expedite the development or review process.

Post-Approval Requirements

Approved biologics that are manufactured or distributed in the United States are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to recordkeeping, periodic reporting, product distribution, advertising and promotion and reporting of adverse experiences with the product. There also are continuing, annual user fee requirements for products marketed pursuant to approved applications.

Any biologics manufactured or distributed pursuant to FDA approvals remain subject to continuing regulation by the FDA, including recordkeeping requirements and reporting of adverse experiences associated with the product. Manufacturers and their subcontractors are required to register their establishments with the FDA and certain state agencies and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with ongoing regulatory requirements, including cGMP, which impose certain procedural and documentation requirements upon manufacturers and contract manufacturers. Changes to the manufacturing process are strictly regulated, and, depending on the significance of the change, may require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting requirements. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMP and other aspects of regulatory compliance.

The FDA may withdraw approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information, requirements for post-market studies or clinical trials to assess new safety risks, or imposition of distribution or other restrictions under a REMS programs. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- fines, warning letters, untitled lets, or holds on clinical trials;
- refusal of the FDA to approve pending applications or supplements to approved applications, or suspension or revocation of product approvals;
- product seizure or detention, or refusal to permit the import or export of products;
- consent decrees, corporate integrity agreements, debarment or exclusion from federal healthcare programs;
- mandated modification of promotional materials and labeling and the issuance of corrective information;
- the issuance of safety alerts, Dear Healthcare Provider letters, press releases and other communications containing warnings or other safety information about the product; or
- injunctions or the imposition of civil or criminal penalties.

The FDA closely regulates the post-approval marketing and promotion of biologics, including standards and regulations for direct-to-consumer advertising, off-label promotion, industry-sponsored scientific and educational activities, and promotional activities involving the internet and social media. A company can make only those claims relating to safety and efficacy that are approved by the FDA. Physicians may prescribe legally available biologics for uses that are not described in the product's labeling and that differ from those tested by us and approved by the FDA. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, impose stringent restrictions on manufacturers' communications regarding off-label use. Failure to comply with these requirements can result in adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties.

Biosimilars and Regulatory Exclusivity

The Affordable Care Act, signed into law in 2010, includes a subtitle called the Biologics Price Competition and Innovation Act, or BPCIA, which created an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an FDA-licensed reference biological product. Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity, and potency, can be shown through analytical studies, animal studies, and a clinical study or studies. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic.

Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing that applicant's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of its product. The BPCIA also created certain exclusivity periods for biosimilars approved as interchangeable products. At this juncture, it is unclear whether products deemed "interchangeable" by the FDA will, in fact, be readily substituted by pharmacies, which are governed by state pharmacy law.

A biological product can also obtain pediatric market exclusivity in the United States. Pediatric exclusivity, if granted, adds six months to existing exclusivity periods and patent terms. This six-month exclusivity, which runs from the end of other exclusivity protection or patent term, may be granted based on the voluntary completion of a pediatric study in accordance with an FDA-issued "Written Request" for such a study.

Orphan Drug Designation

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biologic intended to treat a rare disease or condition, which is a disease or condition that affects fewer than 200,000 individuals in the United States, or if it affects more than 200,000 individuals in the United States, there is no reasonable expectation that the cost of developing and making the product available in the United States for the disease or condition will be recovered from sales of the product. Orphan designation must be

requested before submitting a BLA. Orphan designation does not convey any advantage in or shorten the duration of the regulatory review and approval process, though companies developing orphan products are eligible for certain incentives, including tax credits for qualified clinical testing and waiver of application fees.

If a product that has orphan designation subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to a seven-year period of marketing exclusivity during which the FDA may not approve any other applications to market the same therapeutic agent for the same indication, except in limited circumstances, such as a subsequent product's showing of clinical superiority over the product with orphan exclusivity or where the original applicant cannot produce sufficient quantities of product. Competitors, however, may receive approval of different therapeutic agents for the indication for which the orphan product has exclusivity or obtain approval for the same therapeutic agent for a different indication than that for which the orphan product has exclusivity. Further, if a designated orphan product receives marketing approval for an indication broader than the rare disease or condition for which it received orphan designation, it may not be entitled to orphan exclusivity.

Government Regulation Outside of the United States

To market any product outside of the United States, we would need to comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy and governing, among other things, clinical trials, marketing authorization, manufacturing, commercial sales and distribution of our products. Because biologically sourced raw materials are subject to unique contamination risks, their use may be restricted in some countries. Whether or not we obtain FDA approval of a product, we must obtain the requisite approvals from regulatory authorities in foreign countries prior to the commencement of clinical studies or marketing of the product in those countries. The requirements and process governing the conduct of clinical studies, product licensing, pricing and reimbursement vary from country to country. Failure to comply with applicable foreign regulatory requirements, may be subject to, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution.

Non-clinical studies and clinical trials

Similarly to the United States, the various phases of non-clinical and clinical research in the European Union, or EU, are subject to significant regulatory controls.

Non-clinical studies are performed to demonstrate the health or environmental safety of new biological substances. Non-clinical studies must be conducted in compliance with the principles of good laboratory practice, or GLP, as set forth in EU Directive 2004/10/EC. In particular, non-clinical studies, both in vitro and in vivo, must be planned, performed, monitored, recorded, reported and archived in accordance with the GLP principles, which define a set of rules and criteria for a quality system for the organizational process and the conditions for non-clinical studies. These GLP standards reflect the Organization for Economic Co-operation and Development requirements.

Clinical trials of medicinal products in the EU must be conducted in accordance with EU and national regulations and the International Conference on Harmonization, or ICH, guidelines on Good Clinical Practices, or GCP, as well as the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki. Additional GCP guidelines from the European Commission, focusing in particular on traceability, apply to clinical trials of advanced therapy medicinal products, or ATMPs. If the sponsor of the clinical trial is not established within the EU, it must appoint an EU entity to act as its legal representative. The sponsor must take out a clinical trial insurance policy, and in most EU countries, the sponsor is liable to provide 'no fault' compensation to any study subject injured in the clinical trial.

The regulatory landscape related to clinical trials in the EU has been subject to recent changes. The EU Clinical Trials Regulation, or CTR, which was adopted in April 2014 and repeals the EU Clinical Trials Directive, became applicable on January 31, 2022. Unlike directives, the CTR is directly applicable in all EU member states without the need for member states to further implement it into national law. The CTR notably harmonizes the assessment and supervision processes for clinical trials throughout the EU via a Clinical Trials Information System, which contains a centralized EU portal and database.

While the Clinical Trials Directive required a separate clinical trial application, or CTA, to be submitted in each member state, to both the competent national health authority and an independent ethics committee, much like the FDA and IRB respectively, the CTR introduces a centralized process and only requires the submission of a single application to all member states concerned. The CTR allows sponsors to make a single submission to both the competent authority and an ethics committee in each member state, leading to a single decision per member state. The CTA must include, among other things, a copy of the trial protocol and an investigational medicinal product dossier containing information about the manufacture and quality of the medicinal product under investigation. The assessment procedure of the CTA has been harmonized as well, including a joint assessment by all member states concerned, and a separate assessment by each member state with respect to specific requirements related to its own territory, including ethics rules. Each member state's decision is communicated to the sponsor via the centralized EU portal. Once the CTA is approved, clinical study development may proceed.

The CTR foresees a three-year transition period. The extent to which ongoing and new clinical trials will be governed by the CTR varies. For clinical trials whose CTA was made under the Clinical Trials Directive before January 31, 2022, the Clinical Trials Directive will continue to apply on a transitional basis for three years. Additionally, sponsors may still choose to submit a CTA under

either the Clinical Trials Directive or the CTR until January 31, 2023 and, if authorised, those will be governed by the Clinical Trials Directive until January 31, 2025. By that date, all ongoing trials will become subject to the provisions of the CTR.

During the development of a medicinal product, the EMA and national regulators provide the opportunity for dialogue and guidance on the development program. At the EMA level, this is usually done in the form of scientific advice, which is given by the Scientific Advice Working Party of the Committee for Medicinal Products for Human Use, or CHMP. A fee is incurred with each scientific advice procedure. Advice from the EMA is typically provided based on questions concerning, for example, quality (chemistry, manufacturing and controls testing), nonclinical testing and clinical trials, and pharmacovigilance plans and risk-management programs. Advice is not legally binding with regard to any future marketing authorization application of the product concerned.

Marketing Authorizations

In the EU, medicinal products can only be placed on the market after obtaining a marketing authorization, or MA. To obtain regulatory approval of an investigational biological product in the EU, we must submit a marketing authorization application, or MAA. The process for doing this depends, among other things, on the nature of the medicinal product.

Centralized procedure—Under the centralized procedure, following the opining of the EMA's Committee for Medicinal Products for Human Use, or, CHMP, the European Commission issues a single MA valid throughout the EU. The centralized procedure is compulsory for certain types of products, such as (i) medicinal products derived from biotechnology processes, such as genetic engineering, (ii) designated orphan medicinal products, (iii) ATMPs, such as gene therapy, somatic cell therapy and tissue engineered products, and (iv) medicinal products that contain a new active substance indicated for the treatment of certain diseases, such as HIV/AIDS, cancer, neurodegenerative diseases, diabetes, autoimmune diseases and other immune dysfunctions, and viral diseases. The centralized procedure is optional for any products containing a new active substance not yet authorized in the EU, or for products that constitute a significant therapeutic, scientific or technical innovation or for which the granting of a MA would be in the interest of public health in the EU.

Under the centralized procedure the maximum timeframe for the evaluation of an MAA by the EMA's CHMP is 210 days, excluding clock stops, when additional written or oral information is to be provided by the applicant in response to questions asked by the CHMP. At the end of the review period, the CHMP provides an opinion to the European Commission. If this opinion is favorable, the Commission may then adopt a decision to grant an MA. In exceptional cases, the CHMP might perform an accelerated review of a MAA in no more than 150 days (excluding clock stops), when a medicinal product targets an unmet medical need and is expected to be of a major public health interest, particularly from the point of view of therapeutic innovation. The timeframe for the evaluation of an MAA under the accelerated assessment procedure is 150 days, excluding clock stops.

Innovative products that target an unmet medical need and are expected to be of major public health interest may be eligible for a number of expedited development and review programs, such as the PRIME scheme, which provides incentives similar to the breakthrough therapy designation in the U.S. In March 2016, the EMA launched an initiative, the Priority Medicines, or PRIME, scheme, a voluntary scheme aimed at enhancing the EMA's support for the development of medicines that target unmet medical needs. It is based on increased interaction and early dialogue with companies developing promising medicines, to optimize their product development plans and speed up their evaluation to help them reach patients earlier. Product developers that benefit from PRIME designation can expect to be eligible for accelerated assessment but this is not guaranteed. Many benefits accrue to sponsors of product candidates with PRIME designation, including but not limited to, early and proactive regulatory dialogue with the EMA, frequent discussions on clinical trial designs and other development program elements, and accelerated MAA assessment once a dossier has been submitted. Importantly, a dedicated contact and rapporteur from the CHMP is appointed early in the PRIME scheme facilitating increased understanding of the product at EMA's committee level. An initial meeting initiates these relationships and includes a team of multidisciplinary experts at the EMA to provide guidance on the overall development and regulatory strategies.

National authorization procedures—There are also two other possible routes to authorize medicinal products in several member states, which are available for products that fall outside the scope of the centralized procedure:

- *Decentralized procedure*. Using the decentralized procedure, an applicant may apply for simultaneous authorizations in more than one EU member states of medicinal products that have not yet been authorized in any EU member states and that do not fall within the mandatory scope of the centralized procedure. Under the decentralized procedure an identical dossier is submitted to the national competent authority of each of the member states in which the MA is sought, one of which is selected by the applicant as the reference member state. National MAs are issued by competent authorities of the EU member states for their respective territory.
- *Mutual recognition procedure*. In the mutual recognition procedure, a medicine is first authorized in one EU member state, in accordance with the national procedures of that member state. Following this, further MAs can be sought from other EU member states in a procedure whereby the countries concerned recognize the validity of the original national MA.

MAs have an initial duration of five years. After these five years, the authorization may be renewed on the basis of a reevaluation of the risk-benefit balance. Once renewed, the MA is valid for an unlimited period unless the European Commission or the national competent authority decides, on justified grounds relating to pharmacovigilance, to proceed with one additional five-year renewal.

Data and Marketing Exclusivity

In the EU, upon receiving a MA, reference medicinal products generally receive eight years of data exclusivity and an additional two years of market exclusivity. If granted, data exclusivity period prevents generic or biosimilar applicants from relying on the preclinical and clinical trial data contained in the dossier of the reference product when applying for a generic or biosimilar MA in the EU during a period of eight years from the date on which the reference product was first authorized in the EU. During the additional two-year period of the market exclusivity period a generic or biosimilar MA can be submitted, and the innovator's data may be referenced but no generic or biosimilar can be marketed in the EU until ten years have elapsed from the initial authorization of the reference product in the EU. The overall ten-year market exclusivity period can be extended to a maximum of eleven years if, during the first eight years of those ten years, the MA holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are held to bring a significant clinical benefit in comparison with existing therapies. However, there is no guarantee that a product will be considered by the EU's regulatory authorities to be a new chemical entity, and products may not qualify for data exclusivity.

There is a special regime for biosimilars, or biological medicinal products that are similar to a reference medicinal product but that do not meet the definition of a generic medicinal product, for example, because of differences in raw materials or manufacturing processes. For such products, the results of appropriate preclinical or clinical trials must be provided, and guidelines from the EMA detail the type of quantity of supplementary data to be provided for different types of biological product. There are no such guidelines for complex biological products, such as gene or cell therapy medicinal products, and so it is unlikely that biosimilars of those products will currently be approved in the EU. However, guidance from the EMA states that they will be considered in the future in light of the scientific knowledge and regulatory experience gained at the time.

Orphan Medicinal Products

The criteria for designating an "orphan medicinal product" in the EU are similar in principle to those in the United States. A medicinal product may be designated as orphan if (1) it is intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition; (2) either (a) such condition affects no more than five in 10,000 persons in the EU when the application is made, or (b) the product, without the benefits derived from orphan status, would not generate sufficient return in the EU to justify investment; and (3) there exists no satisfactory method of diagnosis, prevention or treatment of such condition authorized for marketing in the EU, or if such a method exists, the product will be of significant benefit to those affected by the condition. The application for orphan drug designation must be submitted before the MAA. Orphan medicinal products are eligible for financial incentives such as reduction of fees or fee waivers and are, upon grant of a MA, entitled to ten years of market exclusivity for the approved therapeutic indication. During this ten-year orphan market exclusivity period, the competent authorities cannot accept another MAA, or grant a MA, or accept an application to extend a MA for a similar product for the same indication. The period of market exclusivity is extended by two years for orphan medicinal products that have also complied with an agreed pediatric investigation plan, or PIP. No extension to any supplementary protection certificate can be granted on the basis of pediatric studies for orphan indications. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process.

The ten-year market exclusivity may be reduced to six years if, at the end of the fifth year, it is established that the product no longer meets the criteria for orphan designation, for example, if the product is sufficiently profitable not to justify maintenance of market exclusivity. Additionally, a MA may be granted to a similar product for the same indication at any time if (i) the second applicant can establish that its product, although similar, is safer, more effective or otherwise clinically superior; (ii) the applicant consents to a second orphan medicinal product application; or (iii) the applicant cannot supply enough orphan medicinal product.

Pediatric Development

In the EU, MAAs for new medicinal products have to include the results of trials conducted in the pediatric population, in compliance with a PIP agreed with the EMA's Pediatric Committee, or PDCO. The PIP sets out the timing and measures proposed to generate data to support a pediatric indication of the drug for which an MA is being sought. The PDCO can grant a deferral of the obligation to implement some or all of the measures of the PIP until there are sufficient data to demonstrate the efficacy and safety of the product in adults. Further, the obligation to provide pediatric clinical trial data can be waived by the PDCO when these data are not needed or appropriate because the product is likely to be ineffective or unsafe in children, the disease or condition for which the product is intended occurs only in adult populations, or when the product does not represent a significant therapeutic benefit over existing treatments for pediatric patients. Once the MA is obtained in all member states and study results are included in the product information, even when negative, the product is eligible for a six-months supplementary protection certificate extension (if any is in effect at the time of approval) or, in the case of orphan pharmaceutical products, a two year extension of the orphan market exclusivity is granted.

Post-Approval Requirements

Similar to the United States, both MA holders and manufacturers of medicinal products are subject to comprehensive regulatory oversight by the EMA, the European Commission and/or the competent regulatory authorities of the member states. The holder of a MA must establish and maintain a pharmacovigilance system and appoint an individual qualified person for pharmacovigilance who is responsible for oversight of that system. Key obligations include expedited reporting of suspected serious adverse reactions and submission of periodic safety update reports, or PSURs.

All new MAAs must include a risk management plan, or RMP, describing the risk management system that the company will put in place and documenting measures to prevent or minimize the risks associated with the product. The regulatory authorities may also impose specific obligations as a condition of the MA. Such risk-minimization measures or post-authorization obligations may include additional safety monitoring, more frequent submission of PSURs, or the conduct of additional clinical trials or post-authorization safety studies.

The advertising and promotion of medicinal products is also subject to laws concerning promotion of medicinal products, interactions with physicians, misleading and comparative advertising and unfair commercial practices. All advertising and promotional activities for the product must be consistent with the approved summary of product characteristics, and therefore all off-label promotion is prohibited. Direct-to-consumer advertising of prescription medicines is also prohibited in the EU. Although general requirements for advertising and promotion of medicinal products are established under EU directives, the details are governed by regulations in each member state and can differ from one country to another.

Failure to comply with EU and member state laws that apply to the conduct of clinical trials, manufacturing approval, MA of medicinal products and marketing of such products, both before and after grant of the MA, manufacturing of pharmaceutical products, statutory health insurance, bribery and anti-corruption or with other applicable regulatory requirements may result in administrative, civil or criminal penalties. These penalties could include delays or refusal to authorize the conduct of clinical trials, or to grant MA, product withdrawals and recalls, product seizures, suspension, withdrawal or variation of the MA, total or partial suspension of production, distribution, manufacturing or clinical trials, operating restrictions, injunctions, suspension of licenses, fines and criminal penalties.

The aforementioned EU rules are generally applicable in the European Economic Area, or EEA (comprised of the 27 EU member states plus Iceland, Liechtenstein and Norway).

Brexit and the Regulatory Framework in the United Kingdom

The United Kingdom, or UK, left the EU on January 31, 2020, following which existing EU medicinal product legislation continued to apply in the UK during the transition period under the terms of the EU-UK Withdrawal Agreement. The transition period, which ended on December 31, 2020, maintained access to the EU single market and to the global trade deals negotiated by the EU on behalf of its members. The transition period provided time for the UK and EU to negotiate a framework for partnership for the future, which was then crystallized in the Trade and Cooperation Agreement, or TCA, and became effective on the January 1, 2021. The TCA includes specific provisions concerning pharmaceuticals, which include the mutual recognition of GMP inspections of manufacturing facilities for medicinal products and GMP documents issued, but does not foresee wholesale mutual recognition of UK and EU pharmaceutical regulations.

EU laws which have been transposed into UK law through secondary legislation continue to be applicable as “retained EU law”. However, new legislation such as the EU CTR or in relation to orphan medicines will not be applicable. The UK government has passed a new Medicines and Medical Devices Act 2021, which introduces delegated powers in favour of the Secretary of State or an ‘appropriate authority’ to amend or supplement existing regulations in the area of medicinal products and medical devices. This allows new rules to be introduced in the future by way of secondary legislation, which aims to allow flexibility in addressing regulatory gaps and future changes in the fields of human medicines, clinical trials and medical devices.

As of January 1, 2021, the Medicines and Healthcare products Regulatory Agency, or MHRA, is the UK’s standalone medicines and medical devices regulator. As a result of the Northern Ireland protocol, different rules will apply in Northern Ireland than in England, Wales, and Scotland, together, Great Britain, or GB; broadly, Northern Ireland will continue to follow the EU regulatory regime, but its national competent authority will remain the MHRA. The MHRA has published a guidance on how various aspects of the UK regulatory regime for medicines will operate in GB and in Northern Ireland following the expiry of the Brexit transition period on December 31, 2020. The guidance includes clinical trials, importing, exporting, and pharmacovigilance and is relevant to any business involved in the research, development, or commercialization of medicines in the UK. The new guidance was given effect via the Human Medicines Regulations (Amendment etc.) (EU Exit) Regulations 2019, or the Exit Regulations.

The MHRA has introduced changes to national licensing procedures, including procedures to prioritize access to new medicines that will benefit patients, including a 150-day assessment and a rolling review procedure. All existing EU MAs for centrally authorized products were automatically converted or grandfathered into UK MAs, effective in GB (only), free of charge on January 1, 2021, unless the MA holder chooses to opt-out. After Brexit, companies established in the UK cannot use the centralized procedure and instead must follow one of the UK national authorization procedures or one of the remaining post-Brexit international cooperation procedures to obtain an MA to commercialize products in the UK. The MHRA may rely on a decision taken by the European Commission on the approval of a new (centralized procedure) MA when determining an application for a GB authorization; or use the MHRA's decentralized or mutual recognition procedures which enable MAs approved in EU member states (or Iceland, Liechtenstein, Norway) to be granted in GB.

Other Healthcare Laws

In addition to FDA restrictions on marketing of pharmaceutical and biological products, other healthcare regulatory laws restrict business practices in the biotechnology industry, which include, but are not limited to, anti-kickback, false claims, and transparency laws regarding drug pricing and payments and other transfers of value made to physicians and other healthcare providers. The federal Anti-Kickback Statute prohibits the offer, receipt, or payment of remuneration in exchange for or to induce the referral of patients or the use of products or services that would be paid for in whole or part by Medicare, Medicaid or other federal healthcare programs. Remuneration has been broadly interpreted to include anything of value, including cash, improper discounts and free or reduced-price items and services. Further, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it to have committed a violation. Many states have similar laws that apply to their state healthcare programs as well as private payors.

The False Claims Act, or FCA, imposes liability on persons who, among other things, knowingly present or cause to be presented, a false, fictitious or fraudulent claim for payment to, or approval by, the federal government, knowingly make, use, or cause to be made or used a false record or statement material to a false or fraudulent claim to the federal government, or knowingly make a false statement to avoid, decrease or conceal an obligation to pay money to the U.S. federal government. The FCA has been used to prosecute persons submitting claims for payment that are inaccurate or fraudulent, that are for services not provided as claimed, or for services that are not medically necessary. In addition, the government may assert that a claim including items or services resulting from a violation of the Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the False Claims Act. Actions under the FCA may be brought by the Attorney General or as a qui tam action by a private individual in the name of the government. The federal government is using the FCA, and the accompanying threat of significant liability, in its investigation and prosecution of pharmaceutical and biotechnology companies throughout the country, and has obtained multi-million and multi–billion-dollar settlements under the FCA in addition to individual criminal convictions under applicable criminal statutes. In addition, companies have been forced to implement extensive corrective action plans and have often become subject to consent decrees or corporate integrity agreements, severely restricting the manner in which they conduct their business. Given the significant size of actual and potential settlements, it is expected that the government authorities will continue to devote substantial resources to investigating healthcare providers' and manufacturers' compliance with applicable fraud and abuse laws.

The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, created additional federal criminal statutes that prohibit, among other actions, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private third-party payors, knowingly and willfully embezzling or stealing from a healthcare benefit program, willfully obstructing a criminal investigation of a healthcare offense, and knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. Similar to the federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation.

In addition, there has been a recent trend of increased federal and state regulation of payments made to physicians and other healthcare providers. The ACA, among other things, imposed new reporting requirements through the Physician Payments Sunshine Act on certain manufacturers of drugs covered by a federal healthcare program for payments made by them to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), certain non-physician practitioners (physician assistants, nurse practitioners, clinical nurse specialists, certified registered nurse anesthetists, anesthesiology assistants, and certified nurse midwives) and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members. Failure to submit required information may result in civil monetary penalties for all payments, transfers of value or ownership or investment interests that are not timely, accurately and completely reported in an annual submission. Manufacturers must submit reports by the 90th day of each calendar year. Certain states also mandate implementation of compliance programs, impose restrictions on drug manufacturer marketing practices and/or require the tracking and reporting of gifts, compensation and other remuneration to physicians, and pricing information and marketing expenditures.

To the extent that any of our product candidates, once approved, are sold in a foreign country, we may be subject to similar foreign laws and regulations, which may include, for instance, applicable post-marketing requirements, including safety surveillance, anti-fraud and abuse laws, and implementation of corporate compliance programs and reporting of payments or other transfers of value to healthcare professionals.

The shifting commercial compliance environment and the need to build and maintain robust systems to comply with different compliance and/or reporting requirements in multiple jurisdictions increase the possibility that a healthcare company may violate one or more of the requirements. Violations of any of such laws or any other governmental regulations that apply to drug manufacturers may result in significant penalties, including, without limitation, administrative, civil and criminal penalties, damages, fines, disgorgement, the curtailment or restructuring of operations, exclusion from participation in federal and state healthcare programs, reporting obligations and integrity oversight, and imprisonment.

Coverage and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any product candidates for which we obtain regulatory approval. In both domestic and foreign markets, sales and reimbursement of any approved products will depend, in part, on the extent to which third-party payors, such as government health programs, commercial insurance and managed healthcare organizations provide coverage, and establish adequate reimbursement levels for, such products. Third-party payors are increasingly challenging the prices charged for medical products and services and imposing controls to manage costs. Third-party payors may limit, or hinder, coverage to specific products on an approved list, also known as a formulary, which might not include all of the FDA-approved products for a particular indication. Additionally, we may need to conduct expensive pharmacoeconomic studies in order to demonstrate the cost-effectiveness of our products, as well as provide rebates and discounts which may impact the net selling price of our products. If third-party payors do not consider our products to be cost-effective compared to other therapies, the payors may not cover our products as a benefit under their plans or, if they do, the level of reimbursement may not be sufficient to allow us to sell our products on a profitable basis.

The containment of healthcare costs also has become a priority of federal and state governments and the prices of pharmaceutical and biological products have been a focus in this effort. Governments have shown significant interest in implementing cost-containment programs, including price controls, restrictions on reimbursement and requirements for substitution of generic products. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit our net revenue and results.

Outside the United States, ensuring adequate coverage and payment for our products will face challenges. Pricing of prescription pharmaceuticals is subject to governmental control in many countries. Pricing negotiations with governmental authorities can extend well beyond the receipt of regulatory marketing approval for a product and may require us to conduct a clinical trial that compares the cost effectiveness of our product candidates or products to other available therapies. Conducting such a clinical trial could be expensive and result in delays in our commercialization efforts. Third-party payors are challenging the prices charged for medical products and services, and many third-party payors limit reimbursement for newly approved healthcare products. Recent budgetary pressures in many countries are also causing governments to consider or implement various cost-containment measures, such as price freezes, increased price cuts and rebates. If budget pressures continue, governments may implement additional cost-containment measures. Cost-control initiatives could decrease the price we might establish for products that we may develop or sell, which would result in lower product revenues or royalties payable to us. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products. The downward pressure on healthcare costs in general, particularly prescription products, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross border imports from low priced markets exert a commercial pressure on pricing within a country.

Healthcare Reform

In the United States, there have been a number of federal and state proposals during the last few years regarding the pricing of pharmaceutical and biological products, government control and other changes to the healthcare system. It is uncertain what legislative proposals will be adopted or what actions federal, state or private payors for medical goods and services may take in response to any healthcare reform proposals or legislation. We cannot predict the effect medical or healthcare reforms may have on our business, and no assurance can be given that any such reforms will not have a material adverse effect.

By way of example, in March 2010, the ACA was signed into law, which, among other things, includes changes to the coverage and payment for pharmaceutical and biological products under government health care programs. Among other things, the ACA:

- expanded manufacturers' rebate liability under the Medicaid Drug Rebate Program by increasing the minimum rebate for both branded and generic drugs and revising the definition of ''average manufacturer price,'' or AMP, for calculating and reporting Medicaid drug rebates on outpatient prescription drug prices;
- extended Medicaid drug rebates, previously due only on fee-for-service utilization, to Medicaid managed care utilization, and created an alternate rebate formula for new formulations of certain existing products that is intended to increase the amount of rebates due on those drugs;

- expanded the types of entities eligible for the 340B drug discount program that mandates discounts to certain hospitals, community centers and other qualifying providers. With the exception of children's hospitals, these newly eligible entities will not be eligible to receive discounted 340B pricing on orphan drugs. In addition, because 340B pricing is determined based on AMP and Medicaid drug rebate data, the revisions to the Medicaid rebate formula and AMP definition described above could cause the required 340B discounts to increase; and
- established the Medicare Part D coverage gap discount program by requiring manufacturers to provide a 70% point-of-sale-discount off the negotiated price of applicable brand drugs to eligible beneficiaries during their coverage gap period as a condition for the manufacturers' outpatient drugs to be covered under Medicare Part D.

Since its enactment, there have been judicial, executive and Congressional challenges to certain aspects of the ACA. On June 17, 2021, the U.S. Supreme Court dismissed the most recent judicial challenge to the ACA brought by several states without specifically ruling on the constitutionality of the ACA. Thus, the ACA will remain in effect in its current form. Further, prior to the U.S. Supreme Court ruling, President Biden issued an executive order to initiate a special enrollment period from February 15, 2021, through August 15, 2021, for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructed certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA. Other legislative changes have been proposed and adopted in the United States since the ACA was enacted. In For example, the Budget Control Act of 2011, enacted in August 2011, among other things, included reductions of Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013 and, due to subsequent legislative amendments, will remain in effect through 2030, with the exception of a temporary suspension from May 1, 2020 through March 31, 2022, unless additional Congressional action is taken. In January 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, further reduced Medicare payments to several types of providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. More recently, there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which have resulted in several Congressional inquiries and proposed and enacted legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for pharmaceutical and biological products. Individual states in the United States have also become increasingly active in passing legislation and implementing regulations designed to control pharmaceutical product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. Adoption of other new legislation at the federal or state level could further limit reimbursement for pharmaceuticals, including our product candidates if approved.

Data Privacy and Security

We may also be subject to U.S. federal and state and foreign health information privacy, security and data breach notification laws governing the collection, use, disclosure and protection of health-related and other personal information. In the U.S., HIPAA imposes privacy, security and breach reporting obligations with respect to individually identifiable health information upon "covered entities" (health plans, health care clearinghouses and certain health care providers), and their respective business associates, individuals or entities that create, received, maintain or transmit protected health information in connection with providing a service for or on behalf of a covered entity. HIPAA mandates the reporting of certain breaches of health information to the Department of Health and Human Services, or HHS, to affected individuals and if the breach is large enough, to the media. Entities that are found to be in violation of HIPAA as the result of a breach of unsecured protected health information, a complaint about privacy practices or an audit by HHS, may be subject to significant civil, criminal and administrative fines and penalties and/or additional reporting and oversight obligations if required to enter into a resolution agreement and corrective action plan with HHS to settle allegations of HIPAA non-compliance. Even when HIPAA does not apply, according to the Federal Trade Commission or the FTC, failing to take appropriate steps to keep consumers' personal information secure may constitute unfair acts or practices in or affecting commerce in violation of Section 5(a) of the Federal Trade Commission Act. The FTC expects a company's data security measures to be reasonable and appropriate in light of the sensitivity and volume of consumer information it holds, the size and complexity of its business, and the cost of available tools to improve security and reduce vulnerabilities. Individually identifiable health information is considered sensitive data that merits stronger safeguards.

In addition, certain state laws govern the privacy and security of personal information, including health-related information in certain circumstances, some of which are more stringent than HIPAA and many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts. Failure to comply with these laws, where applicable, can result in the imposition of significant civil and/or criminal penalties and private litigation. For example, California enacted the California Consumer Privacy Act, or CCPA, which went into effect January 1, 2020. The CCPA, among other things, creates certain data privacy obligations for covered companies and provides individual privacy rights to California residents, including the right to opt out of certain disclosures of their information. The CCPA also creates a private right of action with statutory damages for certain data breaches, thereby potentially increasing costs associated with a data breach. Although the law includes limited exceptions, including for "protected health information" maintained by a covered entity or business associate, it may regulate or impact our

processing of personal information depending on the context. Further, the California Privacy Rights Act, or CPRA, recently passed in California. The CPRA will impose additional data protection obligations on covered businesses, including additional consumer rights processes, limitations on data uses, new audit requirements for higher risk data, and opt outs for certain uses of sensitive data. It will also create a new California data protection agency authorized to issue substantive regulations and could result in increased privacy and information security enforcement. The majority of the provisions will go into effect on January 1, 2023, and additional compliance investment and potential business process changes may be required.

In addition, certain foreign laws govern the privacy and security of personal data, including health-related data. For example, the EU General Data Protection Regulation, or GDPR, imposes strict requirements for processing the personal data of individuals within the EEA. Companies that must comply with the GDPR face increased compliance obligations and risk, including more robust regulatory enforcement of data protection requirements and potential fines for noncompliance of up to €20 million or 4% of the annual global revenues of the noncompliant company, whichever is greater. Further, from January 1, 2021, companies have had to comply with the GDPR and also 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. Privacy and security laws, regulations, and other obligations are constantly evolving, may conflict with each other to complicate compliance efforts, and can result in investigations, proceedings, or actions that lead to significant civil and/or criminal penalties and restrictions on data processing.

Human Capital

Employees

As of December 31, 2021, we had 333 full-time permanent employees. Forty-four employees work in administration and operations and 289 work in research and development. None of our employees in the U.S. are represented by a labor union or covered by collective bargaining agreements, and we believe our relationship with our employees is good. During 2021, we enhanced our capabilities by significantly expanding our employee base. The new employees were hired to support a variety of functions and key initiatives, including extending our research, clinical and pre-clinical pipeline development, as well as our medical affairs, manufacturing and commercialization capabilities, with hires in commercial, clinical development and operations, research, medical affairs, manufacturing, and general and administrative functions. We expect to continue to add additional employees in 2022, with a focus on further enhancing our capabilities and increasing our capacities in these areas as we continue our focus on gaining FDA approval for SER-109 for recurrent CDI.

Talent Acquisition and Development

We consider the intellectual capital, skills and experience of our employees to be an essential driver of our business and key to our future prospects. We face intense competition for qualified individuals from numerous pharmaceutical and biotechnology companies, universities, governmental entities and other research institutions, and we believe that our future success will depend in large part on our continued ability to attract and retain highly skilled employees. To attract qualified applicants to our company and retain our employees, we offer a total rewards package consisting of base salary and cash target bonus targeting the 50th to 75th percentile of the market based on geography, a comprehensive benefit package and equity compensation for every employee. Annual cash bonus opportunity and equity compensation increase as a percentage of total compensation based on level of responsibility. Any actual bonus payout is based on a combination of individual performance and corporate performance

Diversity, Inclusion, and Belonging

As a microbiome therapeutics company developing a novel class of live biotherapeutic drugs, we believe that our long-term success and ability to deliver innovative, safe and effective medicines to patients requires a diverse and inclusive workforce. We value diversity at all levels of the organization and continue to focus on extending our diversity, equity and inclusion initiatives across our entire workforce, from: working with managers to develop strategies for building diverse, high performing teams; to ensuring that we attract, develop and retain diverse talent from all backgrounds; to increasing awareness within our company of unconscious biases, and supporting affinity groups comprised of individuals who are underrepresented in our company, industry or society, such as women, members of the LGBTQ community and people of color. In addition, we pride ourselves on an open culture that respects co-workers, values employees' health and well-being and fosters professional development. We support employee growth and development in a variety of ways including with group training, individual mentoring and coaching, conference attendance and tuition reimbursement. Our management conducts annual employee engagement surveys and reports to our board of directors on human capital management topics, including corporate culture, diversity, equity and inclusion, employee development and retention, and compensation and benefits. Similarly, our board of directors regularly provides input on important decisions relating to these matters, including with respect to employee compensation and benefits, talent retention and development.

COVID-19 Pandemic

We are operating at a unique time, as we face a serious public safety crisis because of the COVID-19 virus. We remain focused on continuing to serve clinical trial patients, as well as protecting the health and safety of our employees and the communities in which we live and work. At the onset of the COVID-19 pandemic, we activated a task force designed to assess, mitigate and manage

the risks related to COVID-19 to avoid or minimize business disruption, including safeguarding of our facilities, and to ensure the safety and sense of security for our staff. In early March 2020, we closed all sites to non-essential employees. We continue to keep all our sites closed to non-essential employees and encourage remote working arrangements for employees, and we have adopted and implemented additional precautions to accommodate employees returning to worksites safely. To date, our remote working arrangements have not significantly affected our ability to maintain critical business operations.

Our Corporate Information

We were incorporated in the State of Delaware in 2010 under the name Newco LS21, Inc. In October 2011, we changed our name to Seres Health, Inc., and in May 2015, we changed our name to Seres Therapeutics, Inc. Our principal executive offices are located at 200 Sidney Street, Cambridge, Massachusetts 02139 and our telephone number is (617) 945-9626. Our website address is *www.serestherapeutics.com*. The information contained in, or accessible through, our website does not constitute a part of this Annual Report on Form 10-K.

We are subject to the informational requirements of the Securities Exchange Act of 1934, as amended, or the Exchange Act, and, accordingly, file reports, proxy statements and other information with the Securities and Exchange Commission, or SEC. The SEC maintains a web site (http://www.sec.gov) that contains material regarding issuers that file electronically, such as ourselves, with the SEC.

We make available free of charge on our website our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act, as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC.

Item 1A. Risk Factors

Our business faces significant risks and uncertainties. Accordingly, in evaluating our business, you should carefully consider the risk factors discussed below, as well as the other information included or incorporated by reference in this Annual Report on Form 10-K, including our consolidated financial statements and the related notes and "Management's Discussion and Analysis of Financial Condition and Results of Operations." The occurrence of any of the events or developments described below or elsewhere in this report could harm our business, financial condition, results of operations or growth prospects.

Risks Related to Our Financial Position and Need for Additional Capital

We are a development-stage company and have incurred significant losses since our inception. We expect to incur losses for the foreseeable future and may never achieve or maintain profitability.

Since inception, we have incurred significant operating losses. Our net loss was $65.6 million for the year ended December 31, 2021, $89.1 million for the year ended December 31, 2020, and $70.3 million for the year ended December 31, 2019. As of December 31, 2021, we had an accumulated deficit of $614.4 million. To date, we have financed our operations through the public offerings of our common stock, private placements of our common stock and preferred stock, payments under our collaboration agreements, and loan facility. We have devoted substantially all of our financial resources and efforts to developing our microbiome therapeutics platform, identifying potential product candidates and conducting preclinical studies and clinical trials. We have not completed development of any of our product candidates, which we call microbiome therapeutic candidates, or other drugs or biologics. We expect to continue to incur significant expenses and operating losses for the foreseeable future. We anticipate that our expenses may increase substantially as we:

- complete the clinical development, seek regulatory approval, and prepare for potential commercialization of SER-109 for patients with recurrent CDI;
- re-evaluate the clinical development of SER-287 for the treatment of UC in light of the Phase 2b clinical study results and in conjunction with the additional microbiome biomarker data;
- continue the clinical development of SER-301 for treatment of UC;
- continue the clinical development of SER-155 to address gastrointestinal infections, bacteremia and graft-versus-host disease;
- make strategic investments in our research discovery and development platforms and capabilities, including identifying candidates for additional disease indications;

- make strategic investments in manufacturing capabilities;
- maintain and augment our intellectual property portfolio and opportunistically acquire complementary intellectual property;
- potentially establish a sales and distribution infrastructure and scale-up manufacturing capabilities to commercialize any products for which we may obtain regulatory approval;
- perform our obligations under our agreements with our collaborators;
- seek to obtain regulatory approvals for our product candidates; and
- experience any delays or encounter any issues with any of the above, including but not limited to failed studies, complex results, safety issues or other regulatory challenges.

To become and remain profitable, we must succeed in developing and eventually commercializing products that generate significant revenue. This will require us to be successful in a range of challenging activities, including completing preclinical testing and clinical trials of our product candidates, discovering additional product candidates, obtaining regulatory approval for these product candidates and manufacturing, marketing and selling any products for which we may obtain regulatory approval. We are in the preliminary stages of many of these activities. We may never succeed in these activities and, even if we do, may never generate revenue that is significant enough to achieve profitability.

Because of the numerous risks and uncertainties associated with pharmaceutical product and biological development, we are unable to accurately predict the timing or amount of increased expenses or when, or if, we will be able to achieve profitability.

Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable would depress our value and could impair our ability to raise capital, expand our business, maintain our research and development efforts, diversify our product offerings or even continue our operations.

We will need additional funding in order to complete development of our product candidates and commercialize our products, if approved. If we are unable to raise capital when needed, we could be forced to delay, reduce or eliminate our product development programs or commercialization efforts.

Our expenses may increase in connection with our ongoing activities, particularly as we continue the clinical development of SER-109 and prepare for its potential commercialization pending regulatory approval, re-evaluate the clinical development of SER-287, continue clinical studies of SER-301 and SER-155 and continue to research, develop and initiate clinical trials of our other product candidates. In addition, if we obtain regulatory approval for any of our product candidates, we expect to incur significant commercialization expenses related to product manufacturing, marketing, sales and distribution, including under the 2021 License Agreement. Furthermore, we have incurred and expect to continue to incur additional costs associated with operating as a public company, including as a result of no longer qualifying as an “emerging growth company” as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, or as a "smaller reporting company." Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we could be forced to delay, reduce or eliminate our research and development programs or any future commercialization efforts.

We expect that our cash, cash equivalents and investments as of December 31, 2021, including proceeds, net of facility fees and expenses, received in February 2022 in connection with the Second Amendment, will be sufficient to fund our operating expenses, debt service obligations and capital expenditure requirements for at least the next 12 months from the issuance of our consolidated financial statements included elsewhere in this Annual Report on Form 10-K. In addition, the specifics of existing and future clinical trial activities could impact capital requirements and cash projections. We have based this estimate on assumptions that may prove to be wrong, and we could use our capital resources sooner than we currently expect. Our future capital requirements will depend on many factors, including:

- the impact of the COVID-19 pandemic;
- the progress and results of our clinical studies;
- the cost of manufacturing clinical supplies for our product candidates;
- the scope, progress, results and costs of pre-clinical development, laboratory testing and clinical trials for our other product candidates;
- the revenue, if any, received from commercial sales of our product candidates for which we receive marketing approval;

- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims;
- the effect of competing technological and market developments; and
- the extent to which we acquire or invest in businesses, products and technologies, including entering into licensing or collaboration arrangements for product candidates.

Any additional fundraising efforts may divert our management from their day-to-day activities, which may adversely affect our ability to develop and commercialize our product candidates. In addition, we cannot guarantee that future financing will be available in sufficient amounts or on terms acceptable to us, if at all. Additionally, market volatility resulting from the COVID-19 pandemic or other factors could also adversely impact our ability to access capital as and when needed. Moreover, the terms of any financing may adversely affect the holdings or the rights of our stockholders and the issuance of additional securities, whether equity or debt, by us, or the possibility of such issuance, may cause the market price of our shares to decline. The sale of additional equity or convertible securities would dilute all of our stockholders and may decrease our stock price. The incurrence of indebtedness could result in increased fixed payment obligations and we may be required to agree to certain restrictive covenants, such as limitations on our ability to incur additional debt, limitations on our ability to acquire, sell, or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. We could also be required to seek funds through arrangements with collaborators or others at an earlier stage than otherwise would be desirable and we may be required to relinquish rights to some of our technologies or product candidates or otherwise agree to terms unfavorable to us, any of which may have a material adverse effect on our business, operating results and prospects.

If we are unable to obtain funding on a timely basis, we may be required to significantly curtail, delay, or discontinue one or more of our research or development programs or the commercialization of any product candidates, or be unable to expand our operations or otherwise capitalize on our business opportunities, as desired, which could materially affect our business, financial condition and results of operations.

Our limited operating history may make it difficult to evaluate the success of our business to date and to assess our future viability.

Since our inception in October 2010, we have devoted substantially all of our resources to developing our clinical and preclinical program, building our intellectual property portfolio, developing our supply chain, planning our business, raising capital and providing general and administrative support for these operations. We have not yet demonstrated our ability to obtain regulatory approvals, manufacture a commercial-scale product, or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful product commercialization. Additionally, we expect our financial condition and operating results to continue to fluctuate significantly from quarter to quarter and year to year due to a variety of factors, many of which are beyond our control. Consequently, any predictions made about our future success or viability may not be as accurate as they could be if we had a longer operating history.

Risks Related to the Discovery, Development and Regulatory Approval of Our Product Candidates

Other than SER-109 and SER-287, we are early in our development efforts and may not be successful in our efforts to use our microbiome therapeutics platform to build a pipeline of product candidates and develop marketable drugs.

We are using our microbiome therapeutics platform to develop microbiome therapeutic candidates. Other than SER-109 and SER-287, we are at an early stage of development and our platform has not yet, and may never, lead to approvable or marketable drugs. We are developing additional product candidates that we intend to be used to reduce infection and treat diseases where the microbiome is implicated. We may have problems applying our technologies to these areas, and our product candidates may not be effective in reducing infection and disease. Our product candidates may not be suitable for clinical development, including as a result of their harmful side effects, limited efficacy or other characteristics that indicate that they are unlikely to be products that will receive marketing approval and achieve market acceptance.

The success of our product candidates will depend on several factors, including the following:

- completion of preclinical studies and clinical trials with positive results;
- receipt of marketing approvals from applicable regulatory authorities;
- obtaining and maintaining patent and trade secret protection and regulatory exclusivity for our product candidates;
- making arrangements with third-party manufacturers for, or establishing our own, commercial manufacturing capabilities;
- launching commercial sales of our products, if and when approved, whether alone or in collaboration with others;
- entering into new collaborations throughout the development process as appropriate, from preclinical studies through to commercialization;

- acceptance of our products, if and when approved, by patients, the medical community and third-party payors;
- effectively competing with other therapies;
- obtaining and maintaining coverage and adequate reimbursement by third-party payors, including government payors, for our products, if approved;
- protecting our rights in our intellectual property portfolio;
- operating without infringing or violating the valid and enforceable patents or other intellectual property of third parties;
- maintaining a continued acceptable safety profile of our products following approval; and
- maintaining and growing an organization of scientists and business people who can develop and commercialize our products and technology.

If we or our collaborators do not successfully develop and commercialize product candidates we will not be able to obtain product revenue in future periods, which likely would result in significant harm to our financial position and adversely affect our stock price.

Our product candidates are based on microbiome therapeutics, which is an unproven approach to therapeutic intervention.

All of our product candidates are based on microbiome therapeutics, a novel potential class of live biotherapeutic drug candidates, which are consortia of microbes designed to treat or reduce disease by modulating the microbiome through key compositional and functional changes relevant to disease outcomes. We have not, nor to our knowledge has any other company, received regulatory approval for, or manufactured on a commercial scale, a therapeutic based on this approach. We cannot be certain that our approach will lead to the development of approvable or marketable products or that we will be able to manufacture at commercial scale, if approved. In addition, our microbiome therapeutic candidates may have different effectiveness rates in various indications and in different geographical areas. Finally, the FDA or other regulatory authorities may lack experience in evaluating the safety and efficacy of products based on microbiome therapeutics, which could result in a longer than expected regulatory review process, increase our expected development costs and delay or prevent commercialization of our product candidates.

Our microbiome therapeutics platform relies on third parties for biological materials, including human stool. Some biological materials have not always met our expectations or requirements, and any disruption in the supply of these biological materials could materially adversely affect our business. For example, if any supplied biological materials are contaminated with disease organisms, we would not be able to use such biological materials. Although we have control processes and screening procedures, biological materials are susceptible to damage and contamination and may contain active pathogens. Improper storage of these materials, by us or any third-party suppliers, may require us to destroy some of our materials or products, which could delay the development or commercialization of our product candidates.

Clinical drug development involves a risky, lengthy and expensive process, with an uncertain outcome. We may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.

It is difficult to predict when or if any of our product candidates will prove effective and safe in humans or will receive regulatory approval, and the risk of failure through the development process is high. Before obtaining marketing approval from regulatory authorities for the sale of any product candidate, we must complete preclinical development and then conduct extensive clinical trials to demonstrate the safety and efficacy of our product candidates in humans. Clinical testing is expensive, difficult to design and implement, can take many years to complete and is uncertain as to outcome. A failure of one or more clinical trials can occur at any stage of testing, and our clinical trials may not be successful. The outcome of preclinical testing and early clinical trials may not be predictive of the success of later clinical trials, and interim or preliminary results of a clinical trial, that we may from time to time announce, do not necessarily predict final results. A number of companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in advanced clinical trials due to lack of efficacy or adverse safety profiles, notwithstanding promising results in earlier studies, and we cannot be certain that we will not face similar setbacks.

In addition, we cannot be certain as to what type and how many clinical trials the FDA, or other regulatory authorities, will require us to conduct before we may successfully gain approval to market any of our other product candidates. Prior to approving a new therapeutic product, the FDA (or other regulatory authorities) generally requires that safety and efficacy be demonstrated in two adequate and well-controlled clinical trials. In some situations, evidence from a Phase 2 trial and a Phase 3 trial or from a single Phase 3 trial can be sufficient for FDA approval, such as in cases where the trial or trials provide highly reliable and statistically strong evidence of an important clinical benefit.

We may experience numerous unforeseen events during, or as a result of, clinical trials that could delay or prevent our ability to receive marketing approval or commercialize our product candidates, including:

- inability to generate sufficient preclinical, toxicology, or other *in vivo* or *in vitro* data to support the initiation or continuation of clinical trials;
- regulatory authorities or institutional review boards may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- failures or delays in reaching agreement on acceptable clinical trial contracts or clinical trial protocols with prospective trial sites;
- clinical trials of our product candidates may demonstrate undesirable side effects or produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical trials or abandon product development programs;
- the number of patients required for clinical trials of our product candidates may be larger than we anticipate, enrollment in these clinical trials may be slower than we anticipate or participants may drop out of these clinical trials at a higher rate than we anticipate;
- our third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all;
- we may have to suspend or terminate clinical trials of our product candidates for various reasons, including a finding that the participants are being exposed to unacceptable health risks;
- regulatory authorities or institutional review boards (or ethics committees) may require that we or our investigators suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements or a finding that the participants are being exposed to unacceptable health risks;
- the cost of clinical trials of our product candidates may be greater than we anticipate;
- the supply or quality of our product candidates or other materials necessary to conduct clinical trials of our product candidates may be insufficient or inadequate;
- regulatory authorities may revise the requirements for approving our product candidates, or such requirements may not be as we anticipate; and
- regarding trials managed by any current or future collaborators, our collaborators may face any of the above issues, and may conduct clinical trials in ways they view as advantageous to them but potentially suboptimal for us.

If we are required to conduct additional clinical trials or other testing of our product candidates beyond those that we currently contemplate, if we are unable to successfully complete clinical trials of our product candidates or other testing, if the results of these trials or tests are not positive or are only modestly positive or if there are safety concerns, we may:

- be delayed in obtaining marketing approval for our product candidates;
- lose the support of current or any future collaborators, requiring us to bear more of the burden of development of certain compounds;
- not obtain marketing approval at all;
- obtain marketing approval in some countries and not in others;
- obtain approval for indications or patient populations that are not as broad as we intend or desire;
- obtain approval with labeling that includes significant use or distribution restrictions or safety warnings;
- be subject to additional post-marketing testing requirements;
- be subject to increased pricing pressure; or
- have the product removed from the market after obtaining marketing approval.

For example, in March 2020, as a result of the COVID-19 pandemic, we halted further enrollment of the completed ECOSPOR III trial with 182 patients enrolled. Following receipt of the Phase 3 top-line data from ECOSPOR III, the FDA reaffirmed its prior position that safety data from at least 300 patients at 24 weeks will be required for the safety database for SER-109. In September 2021, we achieved target enrollment of 300 subjects with the ECOSPOR IV open-label study. The target enrollment of a minimum of 300 subjects for the SER-109 safety database was reached in conjunction with a prior completed Phase 3 study, ECOSPOR III. We may also be required to treat more patients with SER-109 than we currently expect before we are able to generate a safety database sufficient to allow us to seek approval of SER-109. Additional clinical trials or changes in our development plans could cause us to incur significant development costs, delay or prevent the commercialization of SER-109 or otherwise adversely affect our business. In addition, prolonged disruptions caused by the COVID-19 pandemic could severely impact our preclinical studies and clinical trials, including by causing further difficulties or delays in initiating, enrolling, conducting, or completing our planned and ongoing clinical trials. See "—Risks Related to Our Operations—The COVID-19 pandemic has adversely impacted and could continue to adversely impact, our business, including our preclinical studies and clinical trials, results of operations and financial condition."

Our product development costs will increase if we continue to experience delays in clinical testing or marketing approvals. We do not know whether any of our preclinical studies or clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Significant preclinical or clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our product candidates or allow our competitors to bring products to market before we do, potentially impairing our ability to successfully commercialize our product candidates and harming our business and results of operations.

In addition, the FDA's and other regulatory authorities' policies may change and additional government regulations may be enacted with respect to clinical trials. For instance, the regulatory landscape related to clinical trials in the European Union, or EU, recently evolved. The EU Clinical Trials Regulation, or CTR, which was adopted in April 2014 and repeals the EU Clinical Trials Directive, became applicable on January 31, 2022. While the Clinical Trials Directive required a separate clinical trial application, or CTA, to be submitted in each member state, to both the competent national health authority and an independent ethics committee, the CTR introduces a centralized process and only requires the submission of a single application to all member states concerned. The CTR allows sponsors to make a single submission to both the competent authority and an ethics committee in each member state, leading to a single decision per member state. The assessment procedure of the CTA has been harmonized as well, including a joint assessment by all member states concerned, and a separate assessment by each member state with respect to specific requirements related to its own territory, including ethics rules. Each member state's decision is communicated to the sponsor via the centralized EU portal. Once the CTA is approved, clinical study development may proceed. The CTR foresees a three-year transition period. The extent to which ongoing and new clinical trials will be governed by the CTR varies. For clinical trials whose CTA was made under the Clinical Trials Directive before January 31, 2022, the Clinical Trials Directive will continue to apply on a transitional basis for three years. Additionally, sponsors may still choose to submit a CTA under either the Clinical Trials Directive or the CTR until January 31, 2023 and, if authorised, those will be governed by the Clinical Trials Directive until January 31, 2025. By that date, all ongoing trials will become subject to the provisions of the CTR. Compliance with the CTR requirements by us and our third-party service providers, such as clinical research organizations, or CROs, may impact our developments plans.

It is currently unclear to what extent the United Kingdom, or UK, will seek to align its regulations with the EU. The UK regulatory framework in relation to clinical trials is derived from existing EU legislation (as implemented into UK law, through secondary legislation). On January 17, 2022, the UK Medicines and Healthcare products Regulatory Agency, or MHR, launched an eight-week consultation on reframing the UK legislation for clinical trials. The consultation closes on March 14, 2022 and aims to streamline clinical trials approvals, enable innovation, enhance clinical trials transparency, enable greater risk proportionality, and promote patient and public involvement in clinical trials. The outcome of the consultation will be closely watched and will determine whether the UK chooses to align with the regulation or diverge from it to maintain regulatory flexibility. A decision by the UK not to closely align its regulations with the new approach that will be adopted in the EU may have an effect on the cost of conducting clinical trials in the UK as opposed to other countries and/or make it harder to seek a marketing authorization in the EU for our product candidates on the basis of clinical trials conducted in the UK.

If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies governing clinical trials, our business may be impacted.

Delays or difficulties in the enrollment of patients in clinical trials, could result in our receipt of necessary regulatory approvals being delayed or prevented.

Successful and timely completion of clinical trials will require that we enroll a sufficient number of patient candidates. These trials and other trials we conduct may be subject to delays for a variety of reasons, including as a result of patient enrollment taking longer than anticipated, patient withdrawal or adverse events. These types of developments could cause us to delay the trial or halt further development.

Our clinical trials will compete with other clinical trials that are in the same therapeutic areas as our product candidates, and this competition reduces the number and types of patients available to us, as some patients who might have opted to enroll in our trials may instead opt to enroll in a trial being conducted by one of our competitors. Because the number of qualified clinical investigators

and clinical trial sites is limited, we expect to conduct some of our clinical trials at the same clinical trial sites that some of our competitors use, which will reduce the number of patients who are available for our clinical trials at such clinical trial sites. In addition, there may be limited patient pools from which to draw for clinical studies. In addition to the rarity of some diseases, the eligibility criteria of our clinical studies will further limit the pool of available study participants as we will require that patients have specific characteristics that we can measure or to assure their disease is either severe enough or not too advanced to include them in a study.

Patient enrollment is also affected by other factors including:

- the severity of the disease under investigation;
- the patient eligibility criteria for the study in question;
- the perceived risks and benefits of the product candidate under study;
- the availability of other treatments for the disease under investigation, including the use of unapproved fecal microbiota transplant, or FMT, for CDI;
- the existence of competing clinical trials;
- the efforts to facilitate timely enrollment in clinical trials;
- our payments for conducting clinical trials;
- the patient referral practices of physicians;
- the burden, or perceived burden, of the clinical study;
- the ability to monitor patients adequately during and after treatment; and
- the proximity and availability of clinical trial sites for prospective patients.

Our inability to enroll a sufficient number of patients for our clinical trials or a delayed rate of enrollment would result in significant delays and could require us to abandon one or more clinical trials altogether.

Interim "top-line" and preliminary data from our clinical trials that we announce or publish from time to time may change as more patient data become available and are subject to audit and verification procedures that could result in material changes in the final data.

From time to time, we may publicly disclose interim, top-line or preliminary data from our clinical trials, which is based on a preliminary analysis of then-available data, and the results and related findings and conclusions are subject to change following a more comprehensive review of the data related to the particular study or trial. We also make assumptions, estimations, calculations and conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data. As a result, the top-line or preliminary results that we report may differ from future results of the same studies, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Top-line or preliminary data also remain subject to audit and verification procedures that may result in the final data being materially different from the top-line or preliminary data we previously published. As a result, top-line and preliminary data should be viewed with caution until the final data are available.

From time to time, we may also disclose interim data from our preclinical studies and clinical trials. Interim data from clinical trials that we may complete are subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues and more patient data become available. Adverse differences between interim data and final data could significantly harm our business prospects. Further, disclosure of interim data by us or by our competitors could result in volatility in the price of our common stock.

Further, others, including regulatory authorities, may not accept or agree with our assumptions, estimates, calculations, conclusions or analyses or may interpret or weigh the importance of data differently, which could impact the value of the particular program, the approvability or commercialization of the particular product candidate or product and our company in general. In addition, the information we choose to publicly disclose regarding a particular study or clinical trial is based on what is typically extensive information, and you or others may not agree with what we determine is material or otherwise appropriate information to include in our disclosure.

If the interim, top-line or preliminary data that we report differ from actual results, or if others, including regulatory authorities, disagree with the conclusions reached, our ability to obtain approval for, and commercialize, our product candidates may be harmed, which could harm our business, operating results, prospects or financial condition.

If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals, we or our collaborators will not be able to commercialize our product candidates or will not be able to do so as soon as anticipated, and our ability to generate revenue will be materially impaired.

Our product candidates and the activities associated with their development and commercialization, including their design, testing, manufacture, safety, efficacy, recordkeeping, labeling, storage, approval, advertising, promotion, sale and distribution, are subject to comprehensive regulation by the FDA and other regulatory agencies in the United States and similar regulatory authorities outside the United States. Failure to obtain marketing approval for a product candidate in any jurisdiction will prevent us and our collaborators from commercializing the product candidate in that jurisdiction and may affect our plans for commercialization in other jurisdictions as well. We have not received approval to market any of our product candidates from regulatory authorities in any jurisdiction. We have only limited experience in filing and supporting the applications necessary to gain marketing approvals and expect to rely on third parties to assist us in this process. Securing marketing approval requires the submission of extensive preclinical and clinical data and supporting information to regulatory authorities for each therapeutic indication to establish the product candidate's safety and efficacy. Securing marketing approval also requires the submission of information about the product manufacturing process to, and inspection of manufacturing facilities by, the regulatory authorities. Our product candidates may not be effective, may be only moderately effective or may prove to have undesirable or unintended side effects, toxicities or other characteristics that may preclude our obtaining marketing approval or prevent or limit commercial use.

The process of obtaining marketing approvals, both in the United States and abroad, is expensive, risky and may take many years. The scope and amount of clinical data required to obtain marketing approvals can vary substantially from jurisdiction to jurisdiction, and it may be difficult to predict whether a particular regulatory body will require additional or different studies than those conducted by a sponsor, especially for novel product candidates such as our microbiome therapeutic candidates. The FDA or foreign regulatory authorities may delay, limit, or deny approval to market our product candidates for many reasons, including: our inability to demonstrate that the clinical benefits of our product candidates outweigh any safety or other perceived risks; the regulatory authority's disagreement with the interpretation of data from nonclinical or clinical studies; the regulatory authority's requirement that we conduct additional preclinical studies and clinical trials; changes in marketing approval policies during the development period; changes in or the enactment of additional statutes or regulations, or changes in regulatory review process for each submitted product application; or the regulatory authority's failure to approve the manufacturing processes or third-party manufacturers with which we contract. For instance, the EU pharmaceutical legislation is currently undergoing a complete review process, in the context of the Pharmaceutical Strategy for Europe initiative, launched by the European Commission in November 2020. A proposal for revision of several legislative instruments related to medicinal products (potentially revising the duration of regulatory exclusivity, eligibility for expedited pathways, etc.) is expected to be adopted by the European Commission by the end of 2022. The proposed revisions, once they are agreed and adopted by the European Parliament and European Council (not expected before the end of 2024) may have a significant impact on the biopharmaceutical industry in the long term.

There may also be interruptions or delays in the operations of the FDA or other foreign regulatory authorities due to the COVID-19 pandemic, which may impact approval timelines. Regulatory authorities have substantial discretion in the approval process and may refuse to accept a marketing application if deficient. In addition, varying interpretations of the data obtained from preclinical and clinical testing could delay, limit or prevent marketing approval of a product candidate. Any marketing approval we ultimately obtain may be limited or subject to restrictions or post-approval commitments that render the approved product not commercially viable. Of the large number of drugs in development, only a small percentage successfully complete the FDA or other regulatory approval processes and are commercialized.

Furthermore, our product candidates may not receive marketing approval even if they achieve their specified endpoints in clinical trials. Clinical data is often susceptible to varying interpretations and many companies that have believed that their products performed satisfactorily in clinical trials have nonetheless failed to obtain regulatory authority approval for their products. The FDA or foreign regulatory authorities may disagree with our trial design and our interpretation of data from nonclinical and clinical studies, or they may require additional confirmatory or safety evidence beyond our existing clinical studies. Upon the FDA's review of data from any pivotal trial, it may request that the sponsor conduct additional analyses of the data or gather more data and, if it believes the data are not satisfactory, could advise the sponsor to delay filing a marketing application.

Even if we eventually complete clinical testing and receive approval of a biologics license application, or BLA, or foreign marketing authorization for one of our product candidates, the FDA or the applicable foreign regulatory authority may grant approval contingent on the performance of costly additional clinical trials, which may be required after approval. The FDA or the applicable foreign regulatory authority may also approve our product candidates for a more limited indication and/or a narrower patient population than we originally request, and the FDA, or applicable foreign regulatory authority, may not approve the labeling that we believe is necessary or desirable for the successful commercialization of our product candidates. Any delay in obtaining, or inability to obtain, applicable regulatory approval would delay or prevent commercialization of our product candidates and would materially adversely impact our business and prospects.

The development of therapeutic products targeting the underlying biology of the human microbiome is an emerging field, and it is possible that the FDA and other regulatory authorities could issue regulations or new policies in the future that could adversely affect our microbiome therapeutic candidates.

If we experience delays in obtaining approval or if we fail to obtain approval of our product candidates, the commercial prospects for our product candidates may be harmed and our ability to generate revenues will be materially impaired.

A Fast Track designation by the FDA may not actually lead to a faster development or regulatory review or approval process.

We may seek Fast Track designation for some of our product candidates. If a drug or biologic is intended for the treatment of a serious or life-threatening condition and nonclinical or clinical data demonstrate the potential to address unmet medical needs for this condition, the drug or biologic sponsor may apply for Fast Track designation. SER-287 received Fast Track designation from the FDA for the induction and maintenance of clinical remission in adults with mild-to-moderate UC. Fast Track designation provides increased opportunities for sponsor meetings with the FDA during preclinical and clinical development, in addition to the potential for rolling review of a BLA for such product candidate. The FDA has broad discretion whether or not to grant this designation, and even if we believe another particular product candidate is eligible for this designation, we cannot be certain that the FDA would decide to grant it. Even with Fast Track designation, we may not experience a faster development process, review or approval compared to conventional FDA procedures. Fast Track designation does not assure ultimate approval by the FDA. The FDA may withdraw Fast Track designation if it believes that the designation is no longer supported by data from our clinical development program.

A Breakthrough Therapy designation by the FDA for our product candidates may not lead to a faster development, regulatory review or approval process, and it does not increase the likelihood that our product candidates will receive marketing approval.

We have received Breakthrough Therapy designation for SER-109 for treatment of CDI, and we may seek a Breakthrough Therapy designation for our other product candidates. A Breakthrough Therapy is defined as a drug or biologic that is intended to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the drug or biologic may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed in early clinical development. For drugs or biologics that have been designated as breakthrough therapies, interaction and communication between the FDA and the sponsor can help to identify the most efficient path for clinical development. Drugs designated as breakthrough therapies by the FDA are also eligible for rolling review of the associated marketing application.

Designation as a Breakthrough Therapy is within the discretion of the FDA. Accordingly, even if we believe one of our product candidates meets the criteria for designation as a Breakthrough Therapy, the FDA may disagree and instead determine not to make such designation. The receipt of a Breakthrough Therapy designation for a product candidate may not result in a faster development process, review or approval compared to conventional FDA procedures and does not assure ultimate approval by the FDA. In addition, not all products designated as breakthrough therapies ultimately will be shown to have the substantial improvement over available therapies suggested by the preliminary clinical evidence at the time of designation. As a result, if the Breakthrough Therapy designation for SER-109 or any future designation we receive is no longer supported by subsequent data, the FDA may rescind the designation.

We may seek PRIME designation by EMA or other designations, schemes or tools in the EU for one or more of our product candidates, which we may not receive. Such designations may not lead to a faster development or regulatory review or approval process and do not increase the likelihood that our product candidates will receive marketing authorization.

We may seek EMA PRIME (Priority Medicines) designation or other designations, schemes or tools for one or more of our product candidates. In the EU, innovative products that target an unmet medical need and are expected to be of major public health interest may be eligible for a number of expedited development and review programs, such as the PRIME scheme, which provides incentives similar to the Breakthrough Therapy designation in the United States. PRIME is a voluntary scheme aimed at enhancing the European Medicines Agency's, or EMA, support for the development of medicines that target unmet medical needs. It is based on increased interaction and early dialogue with companies developing promising medicines, to optimize their product development plans and speed up their evaluation to help them reach patients earlier. The benefits of a PRIME designation include the appointment of a rapporteur before submission of a marketing authorization application, early dialogue and scientific advice at key development milestones, and the potential to qualify products for accelerated review earlier in the application process.

Even if we believe one of our product candidates is eligible for PRIME, the EMA may disagree and instead determine not to make such designation. The EMA PRIME scheme or other schemes, designations, or tools, even if obtained or used for any of our product candidates may not lead to a faster development, regulatory review or approval process compared to therapies considered for approval under conventional procedures and do not assure ultimate approval. In addition, even if one or more of our product candidates is eligible to the PRIME scheme, the EMA may later decide that such product candidates no longer meet the conditions for qualification or decide that the time period for review or approval will not be shortened.

Product developers that benefit from PRIME designation may be eligible for accelerated assessment (in 150 days instead of 210 days), which may be granted for medicinal products of major interest from a public health perspective or that target an unmet medical need, but this is not guaranteed.

The competent regulatory authorities in the EU have broad discretion whether to grant such an accelerated assessment, and, even if such assessment is granted, we may not experience a faster development process, review or authorization compared to conventional procedures. Moreover, the removal or threat of removal of such an accelerated assessment may create uncertainty or delay in the clinical development of our product candidates and threaten the commercialization prospects of our products and product candidates, if approved. Such an occurrence could materially impact our business, financial condition and results of operations.

We may seek orphan drug designation for some of our product candidates but may not be able to obtain it.

We have obtained orphan drug designation from the FDA for SER-109 for recurrent CDI and SER-287 for pediatric UC and may seek orphan drug designation and exclusivity for some of our future product candidates. Regulatory authorities in some jurisdictions, including the United States and Europe, may designate drugs and biologics for relatively small patient populations as orphan drugs. In the United States, the FDA may designate a drug or biologic as an orphan drug if it is intended to treat a rare disease or condition, which is defined as a disease or condition that affects fewer than 200,000 individuals in the United States, or a patient population greater than 200,000 in the United States where there is no reasonable expectation that the cost of developing the drug will be recovered from sales in the United States. Orphan drug designation must be requested before submitting a BLA. In the United States, orphan drug designation entitles a party to financial incentives such as opportunities for grant funding towards clinical trial costs, tax advantages and application fee waivers. After the FDA grants orphan drug designation, the generic identity of the drug and its potential orphan use are disclosed publicly by the FDA.

In addition, if a product with an orphan drug designation subsequently receives the first marketing approval for the indication for which it has such designation, the product is entitled to a period of marketing exclusivity, which precludes the FDA or other regulatory authorities from approving another marketing application for the same drug or biologic for that time period, except in limited circumstances, such as a showing of clinical superiority over the product with orphan exclusivity or where the manufacturer is unable to assure sufficient product quantity for the orphan patient population. The applicable period is seven years in the United States and ten years in Europe. The European exclusivity period can be reduced to six years if, at the end of the fifth year, it is established that a product no longer meets the criteria for orphan drug designation or if the product is sufficiently profitable so that market exclusivity is no longer justified. Orphan drug exclusivity may be lost if the FDA or other regulatory authorities determine that the request for designation was materially defective or if the manufacturer is unable to assure a sufficient quantity of the drug or biologic to meet the needs of patients with the rare disease or condition. Exclusive marketing rights in the United States may also be unavailable if we or our collaborators seek approval for an indication broader than the orphan designated indication and may be lost if the FDA later determines that the request for designation was materially defective.

Even if we obtain orphan drug designation, we may not be the first to obtain marketing approval for any particular orphan indication due to the uncertainties associated with developing pharmaceutical products. Further, even if we obtain orphan drug exclusivity for a product candidate, that exclusivity for a product may not effectively protect the product from competition because different drugs and biologics can be approved for the same condition. Even after an orphan drug or biologic is approved, the FDA or other regulatory authorities can subsequently approve the same drug or biologic for the same condition if the FDA or other regulatory authorities conclude that the later drug is clinically superior in that it is shown to be safer, more effective or makes a major contribution to patient care. Orphan drug designation neither shortens the development time or regulatory review time nor gives the drug any advantage in the regulatory review or approval process.

Disruptions at the FDA and other government agencies caused by funding shortages or global health concerns could hinder their ability to hire, retain or deploy key leadership and other personnel, or otherwise prevent new or modified products from being developed, approved or commercialized in a timely manner or at all, which could negatively impact our business.

The ability of the FDA and other regulatory authorities to review and or approve new products can be affected by a variety of factors, including government budget and funding levels, statutory, regulatory, and policy changes, the FDA's and other regulatory authorities' ability to hire and retain key personnel and accept the payment of user fees, and other events that may otherwise affect the FDA's and other regulatory authorities' ability to perform routine functions. Average review times at the FDA have fluctuated in recent years as a result. In addition, government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable. Disruptions at the FDA and other regulatory authorities, such as the EMA, following its relocation to Amsterdam and resulting staff changes, may also slow the time necessary for new drugs and biologics to be reviewed and/or approved by necessary regulatory authorities, which would adversely affect our business. For example, over the last several years, the U.S. government has shut down several times and certain regulatory authorities, such as the FDA, have had to furlough critical FDA employees and stop critical activities.

Separately, in response to the COVID-19 pandemic, in March 2020, the FDA announced its intention to postpone most inspections of foreign manufacturing facilities, and on March 18, 2020, the FDA temporarily postponed routine surveillance inspections of domestic manufacturing facilities. Subsequently, in July 2020, the FDA resumed certain on-site inspections of domestic manufacturing facilities subject to a risk-based prioritization system. The FDA utilized this risk-based assessment system to assist in determining when and where it was safest to conduct prioritized domestic inspections. Additionally, on April 15, 2021, the FDA issued a guidance document in which the FDA described its plans to conduct voluntary remote interactive evaluations of certain drug manufacturing facilities and clinical research sites, among other facilities. According to the guidance, the FDA may request such remote interactive evaluations where the FDA determines that remote evaluation would be appropriate based on mission needs and travel limitations. In May 2021, the FDA outlined a detailed plan to move toward a more consistent state of inspectional operations, and in July 2021, the FDA resumed standard inspectional operations of domestic facilities and was continuing to maintain this level of operation as of September 2021. More recently, the FDA has continued to monitor and implement changes to its inspectional activities to ensure the safety of its employees and those of the firms it regulates as it adapts to the evolving COVID-19 pandemic. Regulatory authorities outside the United States, including the EMA, have adopted similar restrictions or other policy measures in response to the COVID-19 pandemic. If a prolonged government shutdown occurs, or if global health concerns continue to prevent the FDA or other regulatory authorities from conducting their regular inspections, reviews, or other regulatory activities, it could significantly impact the ability of the FDA or other regulatory authorities to timely review and process our regulatory submissions, which could have a material adverse effect on our business.

Risks Related to our Dependence on Third Parties and Manufacturing

The collaboration and license agreements with Société des Produits Nestlé S.A. and NHSc Pharma Partners (collectively, and together with their affiliates and subsidiaries, Nestlé) are important to our business. If we or Nestlé fail to adequately perform under these agreements, or if we or Nestlé terminate the agreements, the development and commercialization of our CDI and IBD product candidates, including SER-109, SER-287 and SER-301, could be delayed or terminated and our business would be adversely affected.

In January 2016, we entered into a Collaboration and License Agreement with Nestlé, or the 2016 License Agreement. The 2016 License Agreement may be terminated:

- by Nestlé in the event of serious safety issues related to SER-109, SER-287, SER-301 or other specific products added under the 2016 License Agreement, or, collectively, the 2016 Collaboration Products;
- by us if Nestlé challenges the validity or enforceability of any of our licensed patents; and
- by either Nestlé or us in the event of the other party's uncured material breach or insolvency.

Upon termination of the 2016 License Agreement, all licenses granted to Nestlé by us will terminate, and all rights in and to the 2016 Collaboration Products held by Nestlé will revert to us. If we commit a material breach of the 2016 License Agreement, Nestlé may elect not to terminate the 2016 License Agreement but instead apply specified adjustments to its payment obligations and other terms and conditions of the 2016 License Agreement. If Nestlé were to make such adjustments, the funding from and benefits of the 2016 License Agreement could be diminished, which could adversely affect our financial condition. Unless the 2016 License Agreement is terminated by us for Nestlé's uncured material breach, upon termination of the 2016 License Agreement, Nestlé will be eligible to receive post-termination royalties from us until Nestlé has recouped certain development costs related to the 2016 Collaboration Products and specified percentages of any milestone payments paid to us under the 2016 License Agreement prior to termination, which could have a material adverse effect on our business.

In July 2021, we entered into a License Agreement with Nestlé, or the 2021 License Agreement. The 2021 License Agreement may be terminated:

- by Nestlé with twelve months' prior written notice, effective only on or after the third anniversary of first commercial sale of our SER-109 product and any improvements and modifications thereto developed pursuant to the terms of the 2021 License Agreement, or the 2021 Collaboration Products;
- by Nestlé if first commercial sale of the first 2021 Collaboration Product has not occurred by the fifth anniversary of the effective date of the 2021 License Agreement, with 180 days' prior written notice, which must be provided during a specified period set forth in the 2021 License Agreement;
- by Nestlé if regulatory approval for SER-109 is not granted after submission by us of a filing seeking first regulatory approval as set forth in the development and regulatory activity plan, and the parties fail to agree on further development of SER-109 in accordance with the terms of the 2021 License Agreement, with 180 days' prior written notice, which must be provided within a specified period set forth in the 2021 License Agreement;
- by us if Nestlé challenges the validity or enforceability of any of our licensed patents; and
- by either Nestlé or us in the event of the other party's uncured material breach or insolvency.

Upon termination of the 2021 License Agreement, all licenses granted to Nestlé by us will terminate. If we commit a material breach of the 2021 License Agreement, Nestlé may elect not to terminate the 2021 License Agreement but instead apply specified adjustments to the payment terms and other terms and conditions of the agreement. If Nestlé were to make such adjustments, the funding from and benefits of the 2021 License Agreement could be diminished, which could adversely affect our financial condition. In the event we materially breach the 2021 License Agreement or file for bankruptcy, the share of profits and milestones due to us will be reduced by a specified percentage until Nestlé has recouped twice the losses caused by our material breach or bankruptcy.

Termination of these agreements could cause significant delays in our product development and commercialization efforts that could prevent us from commercializing our CDI and IBD product candidates without first expanding our internal capabilities or entering into another agreement with a third party. Any alternative collaboration or license could also be on less favorable terms to us. In addition, under the agreements, Nestlé agreed to provide funding for certain clinical development activities. If either of the agreements were terminated, we may need to refund those payments and seek additional financing to support the research and development of any terminated products or discontinue any terminated products, which could have a material adverse effect on our business.

Under the collaboration and license agreements, we are dependent upon Nestlé to successfully commercialize any applicable collaboration products both outside and within the United States and Canada, as applicable. We cannot directly control Nestlé's commercialization activities or the resources it allocates to our product candidates. Our interests and Nestlé's interests may differ or conflict from time to time, or we may disagree with Nestlé's level of effort or resource allocation. Nestlé may internally prioritize our product candidates differently than we do or it may not allocate sufficient resources to effectively or optimally commercialize them. If these events were to occur, our business would be adversely affected.

We rely, and expect to continue to rely, on third parties to conduct our clinical trials, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials.

We expect to continue to rely on third parties, such as CROs, clinical data management organizations, medical institutions and clinical investigators, to conduct and manage our clinical trials.

Our reliance on these third parties for research and development activities will reduce our control over these activities but does not relieve us of our responsibilities. For example, we remain responsible for ensuring that each of our clinical trials is conducted in accordance with the general investigational plan and protocols for the trial. Moreover, the FDA requires us to comply with regulatory standards, commonly referred to as good clinical practices, or GCPs, for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, safety and welfare of trial participants are protected. Regulatory authorities enforce these GCPs through periodic inspections of trial sponsors, principal investigators and trial sites. If we or any of these third parties or our CROs fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical trials comply with GCP regulations. In addition, our clinical trials must be conducted with product produced under cGMP regulations or similar regulatory requirements outside the United States. Our failure to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process. Moreover, our business may be adversely affected if any of these third parties violates federal or state fraud and abuse or false claims laws and regulations or healthcare privacy and security laws. Other countries' regulatory authorities also have requirements for clinical trials with which we must comply. We also are required to register ongoing clinical trials and post the results of completed clinical trials on a government-sponsored database, *ClinicalTrials.gov*, within specified timeframes. Failure to do so can result in fines, adverse publicity and civil and criminal sanctions.

Furthermore, these third parties may also have relationships with other entities, some of which may be our competitors. If these third parties do not successfully carry out their contractual duties, do not meet expected deadlines, experience work stoppages, terminate their agreements with us or need to be replaced, or do not conduct our clinical trials in accordance with regulatory requirements or our stated protocols, we may need to enter into new arrangements with alternative third parties, which could be difficult, costly or impossible, and our clinical trials may be extended, delayed, or terminated or may need to be repeated. If any of the foregoing occur, we may not be able to obtain, or may be delayed in obtaining, marketing approvals for our product candidates and may not be able to, or may be delayed in our efforts to, successfully commercialize our product candidates.

We also expect to rely on other third parties to store and distribute drug supplies for our clinical trials. Any performance failure on the part of our distributors could delay clinical development or marketing approval of our product candidates or commercialization of our products, producing additional losses and depriving us of potential product revenue.

We rely on third parties for certain aspects of the manufacture of our product candidates for preclinical and clinical testing and for potential commercial manufacture, and we expect to continue to do so for the foreseeable future. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates or that such quantities may not be available at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.

We rely, and expect to continue to rely, on third parties, including Recipharm and Bacthera, for certain aspects of materials supply for our product candidates in preclinical and clinical testing, as well as for commercial manufacture if any of our product candidates receive marketing approval. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates on a timely basis or at all, or that such quantities will be available at an acceptable cost or quality, which could delay, prevent or impair our development or commercialization efforts. For example, certain of our product candidates rely on human stool from third-party donors. If we do not obtain an adequate supply of donor-derived material to meet clinical or commercial demand, our ability to manufacture our product candidates may be delayed or adversely impacted.

We rely on third-party manufacturers, which entails additional risks, including:

- failure of third-party manufacturers to comply with regulatory requirements and maintain quality assurance;
- failure of third-party manufacturers to perform the manufacturing process adequately;
- breach of supply agreements by the third-party manufacturers;
- failure to supply components, intermediates, services, or product according to our specifications;
- failure to supply components, intermediates, services, or product according to our schedule or at all;
- misappropriation or disclosure of our proprietary information, including our trade secrets and know-how; and
- termination or nonrenewal of agreements by third-party manufacturers at times that are costly or inconvenient for us.

Third-party manufacturers may not be able to comply with current good manufacturing processes, or cGMP, regulations or similar regulatory requirements inside or outside the United States. Our failure, or the failure of our third-party manufacturers, to comply with applicable regulations could result in sanctions being imposed on us, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, license revocations, seizures or recalls of product candidates or products, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of our products. Some of the contract manufacturers we rely on to produce our product candidates have never produced an FDA-approved therapeutic. One of the contract manufacturers on which we rely will be constructing a building in which to manufacture our product candidates, which may not be completed on time or at all or, upon completion, may not be approved by the FDA. If our manufacturers are unable to comply with cGMP regulation or similar regulatory requirements outside the United States or if the FDA or other regulatory authorities do not approve their facility upon a pre-approval inspection, our therapeutic candidates may not be approved or may be delayed in obtaining approval. In addition, there are a limited number of manufacturers that operate under cGMP regulations and similar regulatory requirements outside the United States that might be capable of manufacturing our products. Therefore, our product candidates and any future products that we may develop may compete with other products for access to manufacturing facilities. Any failure to gain access to these limited manufacturing facilities could severely impact the clinical development, marketing approval and commercialization of our product candidates.

Any performance failure on the part of our existing or future manufacturers could delay clinical development or marketing approval. We do not currently have a second source for certain required materials used for the manufacture of finished product. If our current manufacturers cannot perform as agreed, we may be required to replace such manufacturers and we may be unable to replace them on a timely basis or at all. Our current and anticipated future dependence upon others for the manufacture of our product candidates or products could delay, prevent or impair our development and commercialization efforts. Moreover, as a result of the COVID-19 pandemic, third-party manufacturers may be affected, which could disrupt their activities and as a result we could face difficulty sourcing key components necessary to produce supply of our product candidates, which may negatively affect our preclinical and clinical development activities.

We have no experience manufacturing our product candidates commercially, and we cannot assure you that we can manufacture our product candidates in compliance with regulations at a cost or in quantities necessary to make them commercially viable.

We have manufacturing facilities at our Cambridge, Massachusetts locations where we conduct process development, scale-up activities and a portion of the manufacture of microbiome therapeutics. The FDA and other comparable foreign regulatory authorities must, pursuant to inspections that are conducted after submitting a BLA or relevant foreign marketing submission, confirm that the manufacturing processes for the product meet cGMP or similar regulatory requirements outside the United States. We have not yet had any of our manufacturing facilities inspected.

We currently intend to rely in part on third-party manufacturers for the commercial manufacturing of SER-109 and may establish a manufacturing facility for SER-109 or any of our other product candidates for production at a commercial scale. We have no experience in manufacturing sufficient volume of our product candidates to meet potential market demands. We may not be able to develop commercial-scale manufacturing facilities that are adequate to produce materials for commercial use.

The equipment and facilities employed in the manufacture of pharmaceuticals are subject to stringent qualification requirements by regulatory agencies, including validation of facility, equipment, systems, processes and analytics. We may be subject to lengthy delays and expense in conducting validation studies, if we can meet the requirements at all.

In addition, some of our product candidates require donor material, of which we may not be able to collect sufficient quantities for commercial-scale or other manufacturing.

Risks Related to Commercialization of Our Product Candidates and Other Legal Matters

Even if any of our product candidates receive marketing approval, it may fail to achieve the degree of market acceptance by physicians, patients, hospitals, third-party payors and others in the medical community necessary for commercial success.

If any of our product candidates receives marketing approval, it may nonetheless fail to gain sufficient market acceptance by physicians, patients, third-party payors and others in the medical community. For example, current CDI treatment involves the use of antibiotics that are well established in the medical community or the use of FMT, and physicians may continue to rely on these treatments and our competitors and physicians may continue to seek to standardize and implement this procedure. If our product candidates receive approval but do not achieve an adequate level of acceptance, we or our collaborators may not generate significant product revenue and we may not become profitable. The degree of market acceptance of our approved product candidates, if any, will depend on a number of factors, including:

- their efficacy, safety and other potential advantages compared to alternative treatments;
- the clinical indications for which our products are approved;
- our ability to offer them for sale at competitive prices;
- their convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the strength of marketing and distribution support;
- the availability of third-party coverage and adequate reimbursement for our product candidates;
- the prevalence and severity of their side effects and their overall safety profiles;
- any restrictions on the use of our products together with other medications;
- interactions of our products with other medicines patients are taking; and
- the ability of patients to take our products.

If we or our collaborators are unable to establish effective sales, marketing and distribution capabilities or enter into agreements with third parties with such capabilities, we or our collaborators may not be successful in commercializing our product candidates if and when they are approved.

We have employees with experience in sales and marketing, but we have limited sales or marketing infrastructure and, as a company, have no experience in the sale, marketing, or distribution of pharmaceutical products. To achieve commercial success for any product for which we obtain marketing approval, we will need to establish a sales and marketing organization or make arrangements with third parties to perform sales and marketing functions and we may not be successful in doing so.

In July 2021, we entered into the 2021 License Agreement with Nestlé, pursuant to which we granted Nestlé, under certain of our patent rights and know how, a co-exclusive, sublicensable (under certain conditions) license to develop, commercialize and conduct medical affairs activities for the 2021 Collaboration Products in the United States and Canada. Under the 2021 License Agreement, Nestlé has the sole right to commercialize the 2021 Collaboration Products in the 2021 Licensed Territory in accordance with a commercialization plan, subject to our right to elect to provide up to a specified percentage of all promotional details for a certain target audience. Each party will use commercially reasonable efforts to commercialize the 2021 Collaboration Products in the 2021 Licensed Territory in accordance with the commercialization plan. Both parties will perform medical affairs activities for 2021 Collaboration Products in the 2021 Licensed Territory in accordance with a medical affairs plan. We will be responsible for commercialization and medical affairs activities costs incurred by the parties until first commercial sale of the first 2021 Collaboration Product in the 2021 Licensed Territory and in accordance with a pre-launch plan, up to a specified cap.

In the future, we expect to build a focused sales and marketing infrastructure, or certain components of such infrastructure, to market or co-promote our product candidates in the United States and potentially elsewhere, if and when they are approved. There are risks involved with establishing our own sales, marketing and distribution capabilities. For example, recruiting and training a sales force is expensive and time-consuming and could delay any product launch. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we or our collaborators cannot retain or reposition sales and marketing personnel.

Factors that may inhibit efforts to commercialize our products include:

- inability to recruit, train and retain adequate numbers of effective sales and marketing personnel;
- the inability of sales personnel to obtain access to or educate physicians on the benefits of our products;
- the lack of complementary products to be offered by sales personnel, which may put us at a competitive disadvantage relative to companies with more extensive product lines;
- unforeseen costs and expenses associated with creating an independent sales and marketing organization; and
- inability to obtain sufficient coverage and reimbursement from third-party payors and governmental agencies.

Outside the United States, we rely and may increasingly rely on third parties, including Nestlé, to sell, market and distribute our product candidates. We may not be successful in entering into arrangements with such third parties or may be unable to do so on terms that are favorable to us. In addition, our product revenue and our profitability, if any, may be lower if we rely on third parties for these functions than if we were to market, sell and distribute any products that we develop ourselves. We likely will have little control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market our products effectively. If we do not establish sales, marketing and distribution capabilities successfully, either on our own or in collaboration with third parties, we will not be successful in commercializing our product candidates.

We face substantial competition, which may result in others discovering, developing or commercializing competing products before or more successfully than we do.

The development and commercialization of new drug and biologic products is highly competitive and is characterized by rapid and substantial technological development and product innovations. We and our collaborators face competition with respect to our current product candidates and will face competition with respect to any product candidates that we may seek to develop or commercialize in the future, from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide. We are aware of a number of large pharmaceutical and biotechnology companies, as well as smaller, early-stage companies, that are pursuing the development of products, including microbiome therapeutics, for reducing CDI and other disease indications we are targeting. Some of these competitive products and therapies are based on scientific approaches that are the same as or similar to our approach, and others may be based on entirely different approaches. For example, FMT is a procedure that has resulted in reports of high cure rates for recurrent CDI and our competitors and physicians may continue to seek to standardize and implement this procedure. Potential competitors also include academic institutions, government agencies, not-for-profits, and other public and private research organizations that conduct research, seek patent protection and establish collaborative arrangements for research, development, manufacturing and commercialization.

Many of the companies against which we are competing or against which we may compete in the future have significantly greater financial resources, established presence in the market and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and reimbursement and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors.

These third parties compete with us in recruiting and retaining qualified scientific, sales and marketing and management personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market, especially for any competitor developing a microbiome therapeutic which will likely share our same regulatory approval requirements. In addition, our ability to compete may be affected in many cases by insurers or other third-party payors seeking to encourage the use of generic or biosimilar products.

Even if we are able to commercialize any product candidates, the products may become subject to unfavorable pricing regulations or third-party coverage and reimbursement policies, any of which would harm our business.

Our ability to commercialize any product candidates successfully will depend, in part, on the extent to which coverage and reimbursement for these products and related treatments will be available from government health administration authorities, private health insurers and other organizations. Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which medications they will pay for and impact reimbursement levels.

Obtaining and maintaining adequate reimbursement for our products may be difficult. We cannot be certain if and when we will obtain an adequate level of reimbursement for our products by third-party payors. Even if we do obtain adequate levels of reimbursement, third-party payors, such as government or private healthcare insurers, carefully review, and increasingly question the coverage of, and challenge the prices charged for, drugs. Reimbursement rates from private health insurance companies vary depending on the company, the insurance plan and other factors. A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Government authorities and third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for drugs. We may also be required to conduct expensive pharmacoeconomic studies to justify coverage and reimbursement or the level of reimbursement relative to other therapies. If coverage and reimbursement are not available or reimbursement is available only to limited levels, we may not be able to successfully commercialize any product candidate for which we obtain marketing approval, and the royalties resulting from the sales of those products may also be adversely impacted.

There may be significant delays in obtaining reimbursement for newly approved drugs, and coverage may be more limited than the purposes for which the drug is approved by the FDA or similar regulatory authorities outside the United States. Moreover, eligibility for reimbursement does not imply that a drug will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution. Interim reimbursement levels for new drugs, if applicable, may also not be sufficient to cover our costs and may not be made permanent. Reimbursement rates may vary according to the use of the drug and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost treatment approaches and may be incorporated into existing payments for other services. Net prices for drugs may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. Our inability to promptly obtain coverage and adequate reimbursement rates from both government-funded and private payors for any approved products that we develop could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize products and our overall financial condition.

The regulations that govern marketing approvals, pricing, coverage and reimbursement for new drug products vary widely from country to country. Current and future legislation may significantly change the approval requirements in ways that could involve additional costs and cause delays in obtaining approvals. Some countries require approval of the sale price of a drug before it can be reimbursed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control, including possible price reductions, even after initial approval is granted. As a result, we might obtain marketing approval for a product in a particular country, but then be subject to price regulations that delay our commercial launch of the product, possibly for lengthy time periods, and negatively impact the revenues we are able to generate from the sale of the product in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if our product candidates obtain marketing approval. There can be no assurance that our product candidates, if they are approved for sale in the United States or in other countries, will be considered medically necessary for a specific indication or cost-effective, or that coverage or an adequate level of reimbursement will be available.

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

We face an inherent risk of product liability exposure related to the testing of our product candidates in clinical trials and will face an even greater risk if we commercially sell any products that we may develop. If we cannot successfully defend ourselves against claims that our product candidates or products caused injuries, we will incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- regulatory investigations, product recalls or withdrawals, or labeling, marketing or promotional restrictions;
- decreased demand for any product candidates or products that we may develop;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- significant costs to defend the related litigation;
- substantial monetary awards to trial participants or patients;
- loss of revenue;
- reduced resources of our management to pursue our business strategy; and
- the inability to commercialize any products that we may develop.

We currently hold $5.0 million in product liability insurance coverage in the aggregate, with a per occurrence limit of $5.0 million, which may not be adequate to cover all liabilities that we may incur. We may need to increase our insurance coverage as we expand our clinical trials or if we commence commercialization of our product candidates. Insurance coverage is increasingly expensive. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise.

We may face competition from biosimilars, which may have a material adverse impact on the future commercial prospects of our product candidates.

Even if we and our collaborators are successful in achieving regulatory approval to commercialize a product candidate faster than our competitors, we may face competition from biosimilars. In the United States, the Biologics Price Competition and Innovation Act, or BPCIA, enacted in 2010 as part of the Patient Protection and Affordable Care Act, created an abbreviated approval pathway for biological products that are demonstrated to be "highly similar," or biosimilar, to or "interchangeable" with an FDA-approved biological product. Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing the sponsor's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of their product. This pathway could allow competitors to reference data from innovative biological products 12 years after the time of approval of the innovative biological product. This data exclusivity does not prevent another company from developing a product that is highly similar to the innovative product, generating its own data and seeking approval. Data exclusivity only assures that another company cannot rely upon the data within the innovator's application to support the biosimilar product's approval.

We believe that any of our product candidates approved as a biological product under a BLA should qualify for the 12-year period of exclusivity. However, there is a risk that this exclusivity could be shortened due to congressional action or otherwise, or that the FDA will not consider our product candidates to be reference products for competing products, potentially creating the opportunity for generic competition sooner than anticipated. It is possible that Congress or the FDA may take these or other measures to reduce or eliminate periods of exclusivity. The BPCIA is complex and continues to be interpreted and implemented by the FDA, and such FDA implementation could have a material adverse effect on the future commercial prospects for our product candidates.

In Europe, the European Commission has granted marketing authorizations for several biosimilars pursuant to a set of general and product class-specific guidelines for biosimilar approvals issued over the past few years. In Europe, a competitor may reference data supporting approval of an innovative biological product but will not be able to get on the market until 10 years after the time of approval of the innovative product. This 10-year marketing exclusivity period can be extended to 11 years if, during the first eight of those 10 years, the marketing authorization holder obtains an approval for one or more new therapeutic indications that bring significant clinical benefits compared with existing therapies. In addition, companies may be developing biosimilars in other countries that could compete with our products. If competitors are able to obtain marketing approval for biosimilars referencing our products, our products may become subject to competition from such biosimilars, with the attendant competitive pressure and consequences.

Failure to obtain marketing approval in international jurisdictions would prevent our product candidates from being marketed abroad.

In order to market and sell our products in the European Union and many other jurisdictions, we or our collaborators must obtain separate marketing approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval in foreign countries may differ substantially from that required to obtain FDA approval. Clinical trials conducted in one country may not be accepted by regulatory authorities in other countries. The regulatory approval process outside the United States generally includes all of the risks associated with obtaining FDA approval. In addition, in many countries outside the United States, it is required that the product be approved for reimbursement before the product can be approved for sale in that country. We or our collaborators may not obtain approvals for our product candidates from regulatory authorities outside the United States on a timely basis, if at all. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority outside the United States does not ensure approval by regulatory authorities in other countries or jurisdictions or by the FDA. However, a failure or delay in obtaining regulatory approval in one country may have a negative effect on the regulatory process in others. We may not be able to file for marketing approvals and may not receive necessary approvals to commercialize our products in any market.

Any product candidate for which we obtain marketing approval will remain subject to significant post-marketing regulatory requirements and oversight.

Any product candidate for which we obtain marketing approval, along with the manufacturing processes, post-approval clinical data, labeling, advertising and promotional activities for such product, will be subject to the continual requirements of and review by the FDA and other regulatory authorities. These requirements include submissions of safety and other post-marketing information and reports, registration and listing requirements, cGMP and similar foreign requirements relating to manufacturing, quality control, quality assurance and corresponding maintenance of records and documents, requirements regarding the distribution of samples to physicians and recordkeeping. We and our contract manufacturers will also be subject to continual review and periodic inspections to assess compliance with cGMP and similar foreign requirements. Accordingly, we, and our collaborators and others with whom we work, must continue to expend time, money and effort in all areas of regulatory compliance, including manufacturing, production and quality control.

Even if marketing approval of a product candidate is granted, the approval may be subject to limitations on the indicated uses for which the product may be marketed or to specific conditions of approval, including a requirement to implement a risk evaluation and mitigation strategy, which could include requirements for a medication guide, communication plan, or restricted distribution system. If any of our product candidates receives marketing approval, the accompanying label may limit the approved use of our drug, which could limit sales of the product.

The FDA or other regulatory authorities may also impose requirements for costly post-marketing studies or clinical trials and surveillance to monitor the safety or efficacy of our approved products. The FDA or other regulatory authorities closely regulates the post-approval marketing and promotion of drugs and biologics to ensure they are marketed only for the approved indications and in accordance with the provisions of the approved labeling. Violations of the FDA's and other regulatory authorities' restrictions relating to the promotion of prescription drugs by us or our collaborators may also lead to investigations alleging violations of federal and state health care fraud and abuse laws, as well as state consumer protection laws.

In addition, if a regulatory authority, we or our collaborators later discover previously unknown problems with our products, such as adverse events of unanticipated severity or frequency, problems with manufacturers or manufacturing processes, or failure to comply with regulatory requirements, the regulatory authority may impose restrictions on the products or us and our collaborators, including requiring withdrawal of the product from the market. Any failure by us or our collaborators to comply with applicable regulatory requirements may yield various results, including:

- litigation involving patients taking our products;
- restrictions on such products, manufacturers or manufacturing processes;
- restrictions on the labeling or marketing of a product;
- restrictions on product distribution or use;
- requirements to conduct post-marketing studies or clinical trials;
- warning letters;
- withdrawal of products from the market;
- suspension or termination of ongoing clinical trials;

- refusal to approve pending applications or supplements to approved applications that we submit;
- recall of products;
- fines, restitution or disgorgement of profits or revenues;
- suspension or withdrawal of marketing approvals;
- damage to relationships with potential collaborators;
- unfavorable press coverage and damage to our reputation;
- refusal to permit the import or export of our products;
- product seizure or detention;
- injunctions; or
- imposition of civil or criminal penalties.

Noncompliance with similar EU requirements regarding safety monitoring or pharmacovigilance can also result in significant financial penalties. Similarly, failure to comply with U.S. and foreign regulatory requirements regarding the development of products for pediatric populations and the protection of personal health information can also lead to significant penalties and sanctions.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity.

In addition, the FDA's and other regulatory authorities' policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. We also cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the United States or abroad. For example, the results of the 2020 U.S. Presidential Election may impact our business and industry. Namely, the Trump administration took several executive actions, including the issuance of a number of Executive Orders, that could impose significant burdens on, or otherwise materially delay, the FDA's ability to engage in routine oversight activities such as implementing statutes through rulemaking, issuance of guidance, and review and approval of marketing applications. It is difficult to predict whether or how these orders will be implemented, or whether they will be rescinded and replaced under the Biden administration. The policies and priorities of the new administration are unknown and could materially impact the regulations governing our product candidates.

If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may be subject to enforcement action and we may not achieve or sustain profitability.

The FDA and other regulatory authorities actively enforce the laws and regulations prohibiting the promotion of off-label uses.

If any of our product candidates are approved and we or our collaborators are found to have improperly promoted off-label uses of those products, we may become subject to significant liability. The FDA and other regulatory authorities strictly regulate the promotional claims that may be made about prescription products, such as our product candidates, if approved. In particular, a product may not be promoted for uses that are not approved by the FDA or such other regulatory authorities as reflected in the product's approved labeling. If we receive marketing approval for a product candidate, physicians may nevertheless prescribe it to their patients in a manner that is inconsistent with the approved label. If we or our collaborators are found to have promoted such off-label uses, we may become subject to significant liability. The U.S. federal government has levied large civil and criminal fines against companies for alleged improper promotion of off-label use and has enjoined several companies from engaging in off-label promotion. The FDA has also requested that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed. If we cannot successfully manage the promotion of our product candidates, if approved, we could become subject to significant liability, which would materially adversely affect our business and financial condition.

Our relationships and any collaborators' relationships with customers, physicians and third-party payors are and will be subject to applicable anti-kickback, fraud and abuse and other healthcare laws and regulations, which could expose us or our collaborators to criminal sanctions, civil penalties, exclusion from governmental healthcare programs, contractual damages, reputational harm and diminished profits and future earnings.

Healthcare providers, physicians and third-party payors will play a primary role in the recommendation and prescription of any product candidates for which we obtain marketing approval. Our and our collaborators' current and future arrangements with third-party payors, physicians and customers expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may restrict the business or financial arrangements and relationships through which we market, sell and distribute any products for

which we obtain marketing approval. Restrictions under applicable federal and state healthcare laws and regulations include the following:

- the federal Anti-Kickback Statute prohibits, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under a federal healthcare program, such as Medicare and Medicaid; a person or entity does not need to have actual knowledge of the statute or specific intent to violate it to have committed a violation;
- the False Claims Act, imposes, among other things, impose criminal and civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent, knowingly making, using or causing to be made or used, a false record or statement material to a false or fraudulent claim or from knowingly making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government. In addition, the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal False Claims Act;
- HIPAA, imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters; similar to the federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of these statutes or specific intent to violate them to have committed a violation;
- the federal Physician Payment Sunshine Act requires applicable manufacturers of covered drugs to report payments and other transfers of value to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), certain non-physician practitioners (physician assistants, nurse practitioners, clinical nurse specialists, certified registered nurse anesthetists, anesthesiology assistants, and certified nurse midwives), and teaching hospitals, and ownership and investment interests held by physicians and their immediate family members; manufacturers are required to submit reports to the government by the 90th day of each calendar year; and
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, may apply to our business practices, including but not limited to, research, distribution, sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government (or foreign governments) and may require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers, pricing information or marketing expenditures.

The risk of our or our collaborators being found in violation of these laws is increased by the fact that many of them have not been fully interpreted by the regulatory authorities or the courts, and their provisions are open to a variety of interpretations. Any action against us or our collaborators for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. The shifting compliance environment and the need to build and maintain a robust system to comply with multiple jurisdictions with different compliance and reporting requirements increases the possibility that we may violate one or more of the requirements.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental laws and regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion from government funded healthcare programs, such as Medicare and Medicaid, reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement, and the curtailment or restructuring of our operations.

Recently enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize our product candidates and affect the prices we may obtain.

In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any product candidates for which we obtain marketing approval.

In the United States, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Affordability Reconciliation Act, or collectively the ACA, is a sweeping law intended to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against fraud and abuse, add new transparency requirements for the healthcare and health insurance industries, impose new taxes and fees on the health industry and impose additional health policy reforms.

Among the provisions of the ACA of importance to our potential product candidates are the following:

- establishment of a new pathway for approval of lower-cost biosimilars to compete with biologic products, such as those we are developing;
- an annual, nondeductible fee payable by any entity that manufactures or imports specified branded prescription drugs and biologic agents;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program;
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer point-of-sale discounts off negotiated prices;
- extension of manufacturers' Medicaid rebate liability;
- expansion of eligibility criteria for Medicaid programs;
- expansion of the entities eligible for discounts under the Public Health Service pharmaceutical pricing program;
- a new requirement to annually report drug samples that manufacturers and distributors provide to physicians; and
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in and conduct comparative clinical effectiveness research, along with funding for such research.

Since its enactment, there have been judicial, executive and Congressional challenges to certain aspects of the ACA. On June 17, 2021, the U.S. Supreme Court dismissed the most recent judicial challenge to the ACA brought by several states without specifically ruling on the constitutionality of the ACA. Prior to the Supreme Court's decision, President Biden issued an executive order initiating a special enrollment period from February 15, 2021 through August 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructed certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare. It is unclear how healthcare reform measures enacted by Congress or implemented by the Biden administration or other challenges to the ACA, if any, will impact the ACA or our business. In addition, other legislative changes have been proposed and adopted since the ACA was enacted. For example, the Budget Control Act of 2011, enacted in August 2011, included aggregate reductions of Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments, will remain in effect through 2030, with the exception of a temporary suspension from May 1, 2020 through March 31, 2022, unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and an increase in the statute of limitations period for the government to recover overpayments to providers from three to five years.

Further, in March 2021, the American Rescue Plan Act of 2021 was signed into law, which, among other things, eliminated the statutory cap on drug manufacturers' Medicaid Drug Rebate Program rebate liability, effective January 1, 2024. Under current law enacted as part of the ACA, drug manufacturers' Medicaid Drug Rebate Program rebate liability is capped at 100% of the average manufacturer price for a covered outpatient drug. We expect that other healthcare reform measures that may be adopted in the future may result in additional reductions in Medicare and other healthcare funding, more rigorous coverage criteria, new payment methodologies and in additional downward pressure on the price that we receive for any approved product. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability, or commercialize our product candidates, if approved.

Moreover, there has recently been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products. Individual states in the United States have become increasingly active in implementing regulations designed to contain pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures. Legally mandated price controls on payment amounts by third-party payors or other restrictions could harm our business, results of operations, financial condition and prospects. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other healthcare programs. This could reduce the ultimate demand for our product candidates, if approved, or put pressure on our product pricing, which could negatively affect our business, results of operations, financial condition and prospects.

Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We cannot be sure whether additional legislative changes will be enacted, or whether the FDA or foreign regulations, guidance or interpretations will be changed, or what the impact of such changes on the marketing approvals of our product candidates, if any, may be. In addition, increased scrutiny by Congress of the FDA's approval process may significantly delay or prevent marketing approval, as well as subject us to more stringent product labeling and post-marketing testing and other requirements.

Governments outside the United States tend to impose strict price controls, which may adversely affect our revenues, if any.

In some countries, particularly the EU member states, the pricing of certain pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a product. In addition, there can be considerable pressure by governments and other stakeholders on prices and reimbursement levels, including as part of cost containment measures. Political, economic and regulatory developments may further complicate pricing negotiations, and pricing negotiations may continue after coverage and reimbursement have been obtained. Reference pricing used by various EU member states and parallel distribution or arbitrage between low-priced and high-priced member states, can further reduce prices. To obtain reimbursement or pricing approval in some countries, we may be required to conduct a clinical trial that compares the cost-effectiveness of our product candidate to other available therapies. Other member states allow companies to fix their own prices for medicines but monitor and control company profits. Even if a pharmaceutical product obtains a marketing authorization in the EU, there can be no assurance that reimbursement for such product will be secured on a timely basis or at all. If coverage and reimbursement of our products are unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our business could be harmed, possibly materially.

Risks Related to Our Intellectual Property

If we are unable to adequately protect our proprietary technology or obtain and maintain issued patents that are sufficient to protect our product candidates, others could compete against us more directly, which would have a material adverse impact on our business, results of operations, financial condition and prospects.

Our success depends in large part on our ability to obtain and maintain patent and other intellectual property protection in the United States and other countries with respect to our proprietary technology and products. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our novel technologies and product candidates. We also rely on trade secrets to protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection.

The patent prosecution process is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost, in a timely manner, or in all jurisdictions. Prosecution of our patent portfolio is at a very early stage. For some patent applications in our portfolio, we have filed national stage applications based on our Patent Cooperation Treaty, or PCT, applications, thereby limiting the jurisdictions in which we can pursue patent protection for the various inventions claimed in those applications. 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. It is possible that defects of form in the preparation or filing of our patents or patent applications may exist, or may arise in the future, such as, with respect to proper priority claims, inventorship, claim scope or patent term adjustments. If there are material defects in the form or preparation of our patents or patent applications, such patents or applications may be invalid and unenforceable. Moreover, our competitors may independently develop equivalent knowledge, methods and know-how. Any of these outcomes could impair our ability to prevent competition from third parties, which may have an adverse impact on our business, financial condition and operating results.

We have obtained licenses and options to obtain licenses from third parties and may obtain additional licenses and options in the future. In some circumstances, we may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, covering technology that we license from third parties. We may also require the cooperation of our licensors to enforce any licensed patent rights, and such cooperation may not be provided. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business. Moreover, if we do obtain necessary licenses, we will likely have obligations under those licenses, and any failure to satisfy those obligations could give our licensor the right to terminate the license. Termination of a necessary license could have a material adverse impact on our business.

We have had in the past, and may have in the future, certain funding arrangements. Such funding arrangements impose various obligations on us, including reporting obligations, and may subject certain of our intellectual property, such as intellectual property made using the applicable funding, to the rights of the U.S. government under the Bayh-Dole Act. Any failure to comply with our obligations under a funding arrangement may have an adverse effect on our rights under the applicable agreement or our rights in the applicable intellectual property. Compliance with our obligations or the exercise by the government or other funder of its rights, may limit certain opportunities or otherwise have an adverse effect on our business.

Our patent portfolio currently includes 24 active patent application families (which includes an option to license certain IP from MD Anderson and exclusive licenses to certain IP from Memorial Sloan Kettering Cancer Center). Of these, 21 applications have been nationalized and three are pending at the PCT stage. While we have obtained 18 issued U.S. patents and one currently allowed and soon to issue, we cannot provide any assurances that any of our pending patent applications will mature into issued patents and, if they do, that such patents or our current patents will include claims with a scope sufficient to protect our product candidates or otherwise provide any competitive advantage. For example, we are pursuing claims to therapeutic, binary compositions of certain bacterial populations. Any claims that may issue may provide coverage for such binary compositions and/or their use. However, such claims would not prevent a third party from commercializing alternative compositions that do not include both of the bacterial populations claimed in pending applications, potential applications or patents that have or may issue. There can be no assurance that any such alternative composition will not be equally effective. Further, given that our SER-109 product candidate is a complex composition with some variation from lot-to-lot and that, likewise, third-party compositions may have similar complexity and variability, it is possible that a patent claim may provide coverage for some but not all lots of a product candidate or third-party product. These and other factors may provide opportunities for our competitors to design around our patents, should they issue.

Moreover, other parties have developed technologies that may be related or competitive to our approach and may have filed or may file patent applications and may have received or may receive patents that may overlap or conflict with our patent applications, either by claiming similar methods or by claiming subject matter that could dominate our patent position or cover one or more of our products. In addition, given the early stage of prosecution of our portfolio, it may be some time before we understand how patent offices react to our patent claims and whether they identify prior art of relevance that we have not already considered.

Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore, we cannot know with certainty whether we were the first to make the inventions claimed in any owned patents or pending patent applications, or that we were the first to file for patent protection of such inventions, nor can we know whether those from whom we may license patents were the first to make the inventions claimed or were the first to file. For these and other reasons, the issuance, scope, validity, enforceability and commercial value of our patent rights are subject to a level of uncertainty. Our pending and future patent applications may not result in patents being issued which protect our technology or products, in whole or in part, or which effectively prevent others from commercializing competitive technologies and products. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection.

We may be subject to third-party preissuance submissions of prior art to the United States Patent and Trademark Office, or USPTO, or in a foreign jurisdiction in which our applications are filed, or become involved in opposition, derivation, reexamination, inter partes review, post-grant review or interference proceedings challenging our patent rights or the patent rights of others. For example, on April 25, 2017, we filed a notice of opposition in the European Patent Office challenging the validity of a patent issued to The University of Tokyo. See "*—Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which would be uncertain and could have a material adverse effect on the success of our business*." The oral proceedings were held at the European Patent Office on February 18, 2019 and the Opposition Division required The University of Tokyo to narrow the scope of the claims of the patent. The University of Tokyo has appealed certain aspects of the Opposition Division's decision, as have we and other opponents. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our technology or products and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third-party patent rights. In addition, if the breadth or strength of protection provided by our patents and patent applications is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future product candidates. Furthermore, an adverse decision in an interference proceeding can result in a third party receiving the patent right sought by us, which in turn could affect our ability to develop, market or otherwise commercialize our product candidates. The issuance, scope, validity, enforceability and commercial value of our patents are subject to a level of uncertainty.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has in recent years been the subject of much litigation. Due to legal standards relating to patentability, validity, enforceability and claim scope of patents covering biotechnological and pharmaceutical inventions, our ability to obtain, maintain and enforce patents is uncertain and involves complex legal and factual questions. Even if issued, a patent's validity, inventorship, ownership or enforceability is not conclusive. Accordingly, rights under any existing patent or any patents we might obtain or license may not cover our product candidates, or may not provide us with sufficient protection for our product candidates to afford a commercial advantage against competitive products or processes, including those from branded and generic pharmaceutical companies.

The degree of future protection for our proprietary rights is uncertain, and we cannot ensure that:

- any of our pending patent applications, if issued, will include claims having a scope sufficient to protect our product candidates or any other products or product candidates;
- any of our pending patent applications will issue as patents at all;

- we will be able to successfully commercialize our product candidates, if approved, before our relevant patents expire;
- we were the first to make the inventions covered by any existing patent and pending patent applications;
- we were the first to file patent applications for these inventions;
- others will not develop similar or alternative technologies that do not infringe or design around our patents;
- others will not use pre-existing technology to effectively compete against us;
- any of our patents, if issued, will be found to ultimately be valid and enforceable;
- third parties will not compete with us in jurisdictions where we do not pursue and obtain patent protection;
- we will be able to obtain and/or maintain necessary or useful licenses on reasonable terms or at all;
- any patents issued to us will provide a basis for an exclusive market for our commercially viable products, will provide us with any competitive advantages or will not be challenged by third parties;
- we will develop additional proprietary technologies or product candidates that are separately patentable; or
- our commercial activities or products will not infringe upon the patents or proprietary rights of others.

Any litigation to enforce or defend our patent rights, even if we were to prevail, could be costly and time-consuming and would divert the attention of our management and key personnel from our business operations. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded if we were to prevail may not be commercially meaningful. Even if we are successful, domestic or foreign litigation, or USPTO or foreign patent office proceedings, may result in substantial costs and distraction to our management. We may not be able, alone or with our licensors or potential collaborators, to prevent misappropriation of our proprietary rights, particularly in countries where the laws may not protect such rights as fully as in the United States. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation or other proceedings, 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, during the course of this kind of litigation or proceedings, there could be public announcements of the results of hearings, motions or other interim proceedings or developments or public access to related documents. If investors perceive these results to be negative, the market price for our common stock could be significantly harmed.

If we are unable to protect the confidentiality of our trade secrets and know-how, our business and competitive position may be harmed.

In addition to seeking patents for some of our technology and product candidates, we also utilize our trade secrets, including unpatented know-how, technology and other proprietary information, to maintain our competitive position. We seek to protect these trade secrets, in part, by entering into non-disclosure and confidentiality agreements with parties who have access to them, such as our employees, corporate collaborators, outside scientific collaborators, contract manufacturers, consultants, advisors and other third parties. We also seek to enter into confidentiality and invention or patent assignment agreements with our employees, advisors and consultants. Despite these efforts, 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. Our trade secrets may also be obtained by third parties by other means, such as breaches of our physical or computer security systems. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. Moreover, if any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent them, or those to whom they communicate it, from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor, our competitive position would be harmed.

Changes in U.S. patent law could diminish the value of patents in general, thereby impairing our ability to protect our products.

As is the case with other biotechnology companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biotechnology industry involves both technological and legal complexity, and is therefore costly, time-consuming and inherently uncertain. In addition, patent reform legislation could further increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents. On September 16, 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes a number of significant changes to U.S. patent law. These include provisions that affect the way patent applications are prosecuted and may also affect patent litigation. The USPTO developed new regulations and procedures to govern administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, in particular the first to file provisions, only became effective on March 16, 2013. A third party that files a patent application in the USPTO after that date but before us could therefore be awarded a patent covering an invention of ours even if we had made the invention before it was made by the third party. This will require us to be cognizant going forward of the time from invention to filing of a patent application. Thus, for our U.S. patent applications containing a priority claim after March 16, 2013, there is a greater level of uncertainty in the patent law. Moreover, some of the patent applications in our portfolio will be subject to examination under the pre-Leahy- Smith Act law and regulations, while other patent applications in our portfolio will be subject to examination under the law and regulations, as amended by the Leahy-Smith Act. This introduces additional complexities into the prosecution and management of our portfolio.

In addition, the Leahy-Smith Act limits where a patentee may file a patent infringement suit and provides opportunities for third parties to challenge any issued patent in the USPTO. These provisions apply to all of our U.S. patents, even those issued before March 16, 2013. Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in U.S. federal court 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 federal court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our patent claims because it may be easier for them to do so relative to challenging the patent in a federal court action. It is not clear what, if any, impact the Leahy-Smith Act will have on the operation of our business. However, the Leahy-Smith Act and its 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 and financial condition.

In addition, Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. From time to time, the Supreme Court, other federal courts, Congress, or the USPTO, may change the standards of patentability and any such changes could have a negative impact on our business.

A number of cases decided by the Supreme Court have involved questions of when claims reciting abstract ideas, laws of nature, natural phenomena and/or natural products are eligible for a patent, regardless of whether the claimed subject matter is otherwise novel and inventive. These cases include *Association for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 12-398 (2013); *Alice Corp. v. CLS Bank International*, 573 U.S. 13-298 (2014); and *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 10-1150 (2012). In response to these cases, the USPTO has issued guidance to the examining corps.

The full impact of these decisions is not yet known. For example, in view of these and subsequent court decisions, the USPTO has issued various materials to patent examiners providing guidance for determining the patent eligibility of claims reciting laws of nature, natural phenomena or natural products. Our current product candidates include natural products, therefore, this decision and its interpretation by the courts and the USPTO may impact prosecution, defense and enforcement of our patent portfolio. On March 4, 2014, the USPTO issued a memorandum reflecting the USPTO's interpretation of the cases related to patent eligibility of natural products. The March 4, 2014 memorandum was superseded by interim guidance published on December 15, 2014. Additional guidance was published in July 2015 (July 2015 Update: Subject Matter Eligibility) and May 2016 (May 2016 Subject Matter Eligibility Update). The USPTO's interpretation of the case law and new guidelines for examination may influence, possibly adversely, prosecution and defense of certain types of claims in our portfolio.

In addition to increasing uncertainty with regard to our ability to obtain future patents, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on these and other decisions by Congress, the federal courts and the USPTO, the laws and regulations governing patents could change or be interpreted in unpredictable ways that would weaken our ability to obtain new patents or to enforce any patents that may issue to us in the future. In addition, these events may adversely affect our ability to defend any patents that may issue in procedures in the USPTO or in courts.

Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which would be uncertain and could have a material adverse effect on the success of our business.

Our commercial success depends upon our ability, and the ability of our collaborators, to develop, manufacture, market and sell our product candidates and use our proprietary technologies without infringing the proprietary rights of third parties. There is considerable intellectual property litigation in the biotechnology and pharmaceutical industries. While no such litigation has been brought against us and we have not been held by any court to have infringed a third party's intellectual property rights, we cannot guarantee that our technology, products or use of our products do not infringe third-party patents.

We are aware of numerous patents and pending applications owned by third parties in the fields in which we are developing product candidates, both in the United States and elsewhere. However, we may have failed to identify relevant third-party patents or applications. For example, applications filed before November 29, 2000 and certain applications filed after that date that will not be filed outside the United States remain confidential until patents issue. Moreover, it is difficult for industry participants, including us, to identify all third-party patent rights that may be relevant to our product candidates and technologies because patent searching is imperfect due to differences in terminology among patents, incomplete databases and the difficulty in assessing the meaning of patent claims. We may fail to identify relevant patents or patent applications or may identify pending patent applications of potential interest but incorrectly predict the likelihood that such patent applications may issue with claims of relevance to our technology. In addition, we may be unaware of one or more issued patents that would be infringed by the manufacture, sale or use of a current or future product candidate, or we may incorrectly conclude that a third-party patent is invalid, unenforceable or not infringed by our activities. Additionally, pending patent applications that have been published can, subject to certain limitations, be later amended in a manner that could cover our technologies, our products or the use of our products. We are aware of several pending patent applications containing one or more claims that could be construed to cover some of our product candidates or technology, should those claims issue in their original form or in the form presently being pursued. In addition, we are aware of third-party patent families that include issued and allowed patents, including in the United States, including claims that, if valid and enforceable, could be construed to cover some of our product candidates or their methods of use. On April 25, 2017, we filed a notice of opposition in the European Patent Office challenging the validity of a patent issued to The University of Tokyo and requesting that it be revoked in its entirety for the reasons set forth in our opposition. The oral proceedings were held at the European Patent Office on February 18, 2019 and the Opposition Division required The University of Tokyo to narrow the scope of the claims of the patent. The University of Tokyo has appealed certain aspects of the Oppositions Division's decision, as have we and other opponents.

The biotechnology and pharmaceutical industries are characterized by extensive litigation regarding patents and other intellectual property rights. Other parties may allege that our product candidates or the use of our technologies infringes patent claims or other intellectual property rights held by them or that we are employing their proprietary technology without authorization. We may become party to, or threatened with, future adversarial proceedings or litigation regarding intellectual property rights with respect to our products and technology, including interference or derivation proceedings before the USPTO and similar bodies in other countries. Third parties may assert infringement claims against us based on existing intellectual property rights and intellectual property rights that may be granted in the future. If we were to challenge the validity of an issued U.S. patent in court, such as an issued U.S. patent of potential relevance to some of our product candidates or methods of use, we would need to overcome a statutory presumption of validity that attaches to every U.S. patent. This means that in order to prevail, we would have to present clear and convincing evidence as to the invalidity of the patent's claims. There is no assurance that a court would find in our favor on questions of infringement or validity.

Patent and other types of intellectual property litigation can involve complex factual and legal questions, and their outcome is uncertain. If we are found or believe there is a risk we may be found, to infringe a third party's intellectual property rights, we could be required or may choose to obtain a license from such third party to continue developing and marketing our products and technology. However, we may not be able to obtain any such license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. We could be forced, including by court order, to cease commercializing the infringing technology or product. In addition, we could be found liable for monetary damages, including treble damages and attorneys' fees if we are found to have willfully infringed a patent. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially harm our business. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

Even if we are successful in these proceedings, we may incur substantial costs and divert management time and attention in pursuing these proceedings, which could have a material adverse effect on us. If we are unable to avoid infringing the patent rights of others, we may be required to seek a license, defend an infringement action or challenge the validity of the patents in court, or redesign our products. Patent litigation is costly and time-consuming. We may not have sufficient resources to bring these actions to a successful conclusion. In addition, intellectual property litigation or claims could force us to do one or more of the following:

- cease developing, selling or otherwise commercializing our product candidates;
- pay substantial damages for past use of the asserted intellectual property;

- obtain a license from the holder of the asserted intellectual property, which license may not be available on reasonable terms, if at all; and
- in the case of trademark claims, redesign, or rename, some or all of our product candidates or other brands to avoid infringing the intellectual property rights of third parties, which may not be possible and, even if possible, could be costly and time-consuming.

Any of these risks coming to fruition could have a material adverse effect on our business, results of operations, financial condition and prospects.

Issued patents covering our product candidates could be found invalid or unenforceable or could be interpreted narrowly if challenged in court.

Competitors may infringe our intellectual property, including our patents or the patents of our licensors. As a result, we may be required to file infringement claims to stop third-party infringement or unauthorized use. This can be expensive, particularly for a company of our size, and time-consuming. If we initiated legal proceedings against a third party to enforce a patent, if and when issued, covering one of our product candidates, the defendant could counterclaim that the patent covering our product candidate is invalid and/or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity and/or unenforceability are commonplace. Grounds for a validity challenge include alleged failures to meet any of several statutory requirements, including lack of novelty, obviousness or non-enablement, or failure to claim patent eligible subject matter. Grounds for unenforceability assertions include allegations that someone connected with prosecution of the patent withheld relevant information from the USPTO, or made a misleading statement, during prosecution. Third parties may also raise similar claims before administrative bodies in the United States or abroad, even outside the context of litigation. Such mechanisms include re-examination, post grant review and equivalent proceedings in foreign jurisdictions, such as opposition proceedings. Such proceedings could result in revocation or amendment of our patents in such a way that they no longer cover our product candidates or competitive products. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to validity, for example, we cannot be certain that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the patent protection on our product candidates. Moreover, even if not found invalid or unenforceable, the claims of our patents could be construed narrowly or in a manner that does not cover the allegedly infringing technology in question. Such a loss of patent protection would have a material adverse impact on our business.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for noncompliance with these requirements.

Periodic maintenance fees on any issued patent are due to be paid to the USPTO and foreign patent agencies in several stages over the lifetime of the patent and, in some jurisdictions, during the pendency of a patent application. The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. While an inadvertent lapse can in many cases be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which noncompliance 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. Noncompliance events that could result in abandonment or lapse of a patent or patent application include, but are not limited to, failure to respond to official actions within prescribed time limits, non-payment of fees and failure to properly legalize and submit formal documents. In such an event, our competitors might be able to enter the market, which would have a material adverse effect on our business.

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

It is our policy to enter into confidentiality and intellectual property assignment agreements with our employees, consultants, contractors and advisors. These agreements generally provide that inventions conceived by the party in the course of rendering services to us will be our exclusive property. However, these agreements may not be honored and may not effectively assign intellectual property rights to us. For example, even if we have a consulting agreement in place with an academic advisor pursuant to which such academic advisor is required to assign any inventions developed in connection with providing services to us, such academic advisor may not have the right to assign such inventions to us, as it may conflict with his or her obligations to assign all such intellectual property to his or her employing institution.

Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If we 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, valuable intellectual property. Such an outcome could have a material adverse effect on our business. 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.

We may be subject to claims by third parties asserting that our employees or we have misappropriated their intellectual property, or claiming ownership of what we regard as our own intellectual property.

Many of our employees were previously employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. We may also engage advisors and consultants who are concurrently employed at universities or other organizations or who perform services for other entities. Although we try to ensure that our employees, advisors and consultants do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, advisors or consultants have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such party's former or current employer or in violation of an agreement with another party. Although we have no knowledge of any such claims being alleged to date, if such claims were to arise, litigation may be necessary to defend against any such claims.

In addition, while it is our policy to require our employees, consultants, advisors and contractors who may be involved in the 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 develops intellectual property that we regard as our own. Our and their assignment agreements may not be self-executing or may be breached, and we may be forced to bring claims against third parties, or defend claims they may bring against us, to determine the ownership of what we regard as our intellectual property. Similarly, we may be subject to claims that an employee, advisor or consultant performed work for us that conflicts with that person's obligations to a third party, such as an employer, and thus, that the third party has an ownership interest in the intellectual property arising out of work performed for us. Litigation may be necessary to defend against these claims. Although we have no knowledge of any such claims being alleged to date, if such claims were to arise, litigation may be necessary to defend against any such claims.

If we fail in prosecuting or defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in prosecuting or defending against such claims, litigation could result in substantial costs and be a distraction to management.

If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected.

Our registered or unregistered trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition among potential collaborators or customers in our markets of interest. At times, competitors may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement claims brought by owners of other registered trademarks or trademarks that incorporate variations of our registered or unregistered trademarks or trade names. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected. Our efforts to enforce or protect our proprietary rights related to trademarks, trade secrets, domain names, copyrights or other intellectual property may be ineffective and could result in substantial costs and diversion of resources and could adversely impact our financial condition or results of operations.

We will not seek to protect our intellectual property rights in all jurisdictions throughout the world and we may not be able to adequately enforce our intellectual property rights even in the jurisdictions where we seek protection.

Filing, prosecuting and defending patents on product candidates in all countries and jurisdictions throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States could be less extensive than in the United States, assuming that rights are obtained in the United States and assuming that rights are pursued outside the United States. The statutory deadlines for pursuing patent protection in individual foreign jurisdictions are based on the priority date of each of our patent applications. For each of the patent families that we believe provide coverage for our product candidates, we decide whether and where to pursue protection outside the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, even if we do elect to pursue patent rights outside the United States, we may not be able to obtain relevant claims and/or we may not be able to prevent third parties from practicing our inventions in 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 do not pursue and obtain patent protection to develop their own products and further, may export otherwise 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 and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing. Even if we pursue and obtain issued patents in particular jurisdictions, our patent claims or other intellectual property rights may not be effective or sufficient to prevent third parties from so competing.

The laws of some foreign countries do not protect intellectual property rights to the same extent as the laws of the United States. Many companies have encountered significant problems in protecting and defending intellectual property rights in certain foreign jurisdictions. The legal systems of some countries, particularly developing countries, do not favor the enforcement of patents and other intellectual property protection, especially those relating to biotechnology. This could make it difficult for us to stop the infringement of our patents, if obtained, or the misappropriation of our other intellectual property rights. For example, many foreign countries have compulsory licensing laws under which a patent owner must grant licenses to third parties. In addition, many countries limit the enforceability of patents against third parties, including government agencies or government contractors. In these countries, patents may provide limited or no benefit. Patent protection must ultimately be sought on a country-by-country basis, which is an expensive and time-consuming process with uncertain outcomes. Accordingly, we may choose not to seek patent protection in certain countries, and we will not have the benefit of patent protection in such countries.

If our ability to obtain and, if obtained, enforce our patents to stop infringing activities is inadequate, third parties may compete with our products, and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing. Accordingly, our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property we develop or license.

Risks Related to Our Operations

The COVID-19 pandemic has adversely impacted and could continue to adversely impact, our business, including our preclinical studies and clinical trials, results of operations and financial condition.

The COVID-19 pandemic and government measures taken in response have also had a significant impact, both direct and indirect, on businesses and commerce, as worker shortages have occurred, supply chains have been disrupted, and facilities and production have been suspended. In response to the spread of COVID-19 we have limited on-site staff to only those required on-site to execute their job responsibilities and limited the number of staff in any given research and development laboratory. We are continuing to monitor the impact of the COVID-19 pandemic on our operations and ongoing clinical development activity. Our mitigation activities to minimize COVID-19-related operation disruptions are ongoing, however, given the severity and evolving nature of the situation, the timing of clinical readouts is uncertain. As a result of the COVID-19 pandemic, we or our collaborators may experience further disruptions that could severely impact our business, preclinical studies and clinical trials, including:

- delays in receiving approval from local regulatory authorities to initiate our planned clinical trials;
- delays or difficulties in enrolling patients in our clinical trials;
- delays or difficulties in clinical site initiation, including difficulties in recruiting clinical site investigators and clinical site staff;
- diversion of healthcare resources away from the conduct of clinical trials, including the diversion of hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our clinical trials;
- risk that participants enrolled in our clinical trials will contract COVID-19 while the clinical trial is ongoing, which could impact the results of the clinical trial, including by increasing the number of observed adverse events;
- interruption of key clinical trial activities, such as clinical trial site data monitoring, due to limitations on travel imposed or recommended by federal or state governments, employers and others or interruption of clinical trial subject visits and study procedures (such as endoscopies that are deemed non-essential), which may impact the integrity of subject data and clinical study endpoints;
- interruption or delays in the operations of the FDA or other regulatory authorities, which may impact approval timelines;
- interruption of, or delays in receiving, supplies of our product candidates from our contract manufacturing organizations due to staffing shortages, production slowdowns, global shipping delays or stoppages and disruptions in delivery systems;
- limitations on employee resources that would otherwise be focused on the conduct of our preclinical studies and clinical trials, including because of sickness of employees or their families or the desire of employees to avoid contact with large groups of people.
- refusal of the FDA or other regulatory authorities to accept data from clinical trials in affected geographies;
- impacts from prolonged remote work arrangements, such as increased cybersecurity risks and strains on our business continuity plans; and
- delays or difficulties with equity offerings due to disruptions and uncertainties in the securities market.

In addition, the trading prices for our and other biopharmaceutical companies' stock have been highly volatile as a result of the COVID-19 pandemic. As a result, we may face difficulties raising capital through sales of our common stock and any such sales may be on unfavorable terms. The COVID-19 pandemic continues to rapidly evolve. The extent to which the pandemic further impacts our business, including our preclinical studies and clinical trials, results of operations and financial condition will depend on future developments which are highly uncertain and cannot be predicted with confidence. Such factors include but are not limited to the duration and severity of the pandemic, the impact of variants, travel restrictions, quarantines, shelter-in-place orders and social distancing recommendations and regulations in the United States and other countries, business closures or business disruptions, the adoption and effectiveness of vaccines and vaccine distribution efforts, and the effectiveness of other actions taken in the United States and other countries to contain and treat the disease.

Our future success depends on our ability to retain key executives and to attract, retain and motivate qualified personnel.

We are highly dependent on Eric Shaff, our President and Chief Executive Officer, as well as the other principal members of our management, scientific and clinical team. Although we have entered into employment agreements with our executive officers, each of them may terminate their employment with us at any time. We do not maintain "key person" insurance for any of our executives or other employees.

Recruiting and retaining qualified scientific, clinical, manufacturing and sales and marketing personnel will also be critical to our success. The loss of the services of our executive officers or other key employees could impede the achievement of our research, development and commercialization objectives and seriously harm our ability to successfully implement our business strategy. Furthermore, replacing executive officers and key employees may be difficult 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 successfully develop, gain regulatory approval of and commercialize products. Competition to hire from this limited pool is intense, and we may be unable to hire, train, retain or motivate these key personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by employers 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 high quality personnel, our ability to pursue our growth strategy will be limited.

We may expand our operational capabilities, and as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.

We may experience significant growth in the number of our employees and the scope of our operations, particularly in the areas of lead discovery and product development, regulatory affairs, clinical affairs and manufacturing and, if any of our product candidates receives marketing approval, sales, marketing and distribution. To manage potential future growth, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such potential growth, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. The expansion of our operations may lead to significant costs and may divert our management and business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

A variety of risks associated with operating internationally could materially adversely affect our business.

We currently have limited international operations, but our business strategy incorporates potentially expanding internationally if any of our product candidates receive regulatory approval. We currently conduct clinical studies in Canada, Australia and New Zealand. We may conduct clinical studies in other countries as well. We currently plan to rely on collaborators, including Nestlé, to commercialize certain approved products outside of North America. Doing business internationally involves a number of risks, including but not limited to:

- multiple, conflicting and changing laws and regulations, such as privacy regulations, tax laws, export and import restrictions, employment laws, regulatory requirements and other governmental approvals, permits and licenses;
- failure by us to obtain and maintain regulatory approvals for the use of our products in various countries;
- additional potentially relevant third-party patent rights;
- complexities and difficulties in obtaining protection and enforcing our intellectual property;
- difficulties in staffing and managing foreign operations;
- complexities associated with managing multiple payor reimbursement regimes, government payors or patient self-pay systems;

- limits in our ability to penetrate international markets;
- global macroeconomic conditions, including inflation, labor shortages, supply chain shortages, or other economic, political or legal uncertainties or adverse developments;
- 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;
- political unrest and wars, such as the current situation with Ukraine and Russia, which could delay or disrupt our business, and if such political unrest escalates or spills over to or otherwise impacts additional regions it could heighten many of the other risk factors included in this Item 1A;
- natural disasters, political and economic instability, including terrorism and political unrest, outbreak of disease or epidemics such as the COVID-19 pandemic, boycotts, curtailment of trade and other business restrictions;
- certain expenses including, among others, expenses for travel, translation and insurance; and
- regulatory and compliance risks that relate to maintaining accurate information and control over sales and activities that may fall within the purview of the U.S. Foreign Corrupt Practices Act, its books and records provisions, or its anti-bribery provisions.

Any of these factors could significantly harm our future international expansion and operations and, consequently, our results of operations.

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.

Actual or perceived failures to comply with applicable data protection, privacy and security laws, regulations, standards and other requirements could adversely affect our business, results of operations, and financial condition.

The global data protection landscape is rapidly evolving, and we are or may become subject to numerous state, federal and foreign laws, requirements and regulations governing the collection, use, disclosure, retention, and security of personal information, such as information that we may collect in connection with clinical trials in the U.S. and abroad. Implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future, and we cannot yet determine the impact future laws, regulations, standards, or perception of their requirements may have on our business. This evolution may create uncertainty in our business, affect our ability to operate in certain jurisdictions or to collect, store, transfer use and share personal information,

necessitate the acceptance of more onerous obligations in our contracts, result in liability or impose additional costs on us. The cost of compliance with these laws, regulations and standards is high and is likely to increase in the future. Any failure or perceived failure by us to comply with federal, state or foreign laws or regulation, our internal policies and procedures or our contracts governing our processing of personal information could result in negative publicity, government investigations and enforcement actions, claims by third parties and damage to our reputation, any of which could have a material adverse effect on our operations, financial performance and business.

In the U.S., HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, and their implementing regulations, or collectively HIPAA, imposes privacy, security and breach notification obligations on certain healthcare providers, health plans, and healthcare clearinghouses, known as covered entities, as well as their business associates that perform certain services that involve creating, receiving, maintaining or transmitting individually identifiable health information for or on behalf of such covered entities, and their covered subcontractors. Most healthcare providers, including research institutions from which we obtain clinical trial information, are subject to privacy and security regulations promulgated under HIPAA. We do not believe that we are currently acting as a covered entity or business associate under HIPAA and thus are not directly subject to its requirements or penalties. However, any person may be prosecuted under HIPAA's criminal provisions either directly or under aiding-and-abetting or conspiracy principles. Consequently, depending on the facts and circumstances, we could face substantial criminal penalties if we knowingly receive individually identifiable health information from a HIPAA-covered healthcare provider or research institution that has not satisfied HIPAA's requirements for disclosure of individually identifiable health information.

Certain states have also adopted comparable privacy and security laws and regulations, some of which may be more stringent than HIPAA. Such laws and regulations will be subject to interpretation by various courts and other governmental authorities, thus creating potentially complex compliance issues for us and our future customers and strategic partners. In addition, the CCPA went into effect on January 1, 2020. The CCPA creates individual privacy rights for California consumers and increases the privacy and security obligations of entities handling certain personal information. The CCPA provides for civil penalties for violations, as well as a private right of action for data breaches that is expected to increase data breach litigation. Further, the CPRA recently passed in California. The CPRA will impose additional data protection obligations on covered businesses, including additional consumer rights processes, limitations on data uses, new audit requirements for higher risk data, and opt outs for certain uses of sensitive data. It will also create a new California data protection agency authorized to issue substantive regulations and could result in increased privacy and information security enforcement. The majority of the provisions will go into effect on January 1, 2023, and additional compliance investment and potential business process changes may be required. Similar laws have passed in Virginia and Colorado, and have been proposed in other states and at the federal level, reflecting a trend toward more stringent privacy legislation in the United States. The enactment of such laws could have potentially conflicting requirements that would make compliance challenging. In the event that we are subject to or affected by HIPAA, the CCPA, the CPRA or other domestic privacy and data protection laws, any liability from failure to comply with the requirements of these laws could adversely affect our financial condition.

Our operations abroad may also be subject to increased scrutiny or attention from data protection authorities. For example, in Europe, the GDPR went into effect in May 2018 and imposes strict requirements for processing the personal data of individuals within the EEA. Companies that must comply with the GDPR face increased compliance obligations and risk, including more robust regulatory enforcement of data protection requirements and potential fines for noncompliance of up to €20 million or 4% of the annual global revenues of the noncompliant company, 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; in July 2020, the Court of Justice of the EU, or CJEU, limited how organizations could lawfully transfer personal data from the EU/EEA to the United States by invalidating the Privacy Shield for purposes of international transfers and imposing further restrictions on the use of standard contractual clauses, or SCCs. The European Commission issued revised SCCs on June 4, 2021 to account for the decision of the CJEU and recommendations made by the European Data Protection Board. The revised SCCs must be used for relevant new data transfers from September 27, 2021; existing standard contractual clauses arrangements must be migrated to the revised clauses by December 27, 2022. The new SCCs apply only to the transfer of personal data outside of the EEA and not the UK; the UK's Information Commissioner's Office launched a public consultation on its draft revised data transfers mechanisms in August 2021 and laid its proposal before Parliament, with the UK SCCs expected to come into force in March 2022, with a two-year grace period. There is some uncertainty around whether the revised clauses can be used for all types of data transfers, particularly whether they can be relied on for data transfers to non-EEA entities subject to the GDPR. As supervisory authorities issue further guidance on personal data export mechanisms, including circumstances where the SCCs cannot be used, and/or start taking enforcement action, we could suffer additional costs, complaints and/or regulatory investigations or fines, and/or if we are otherwise unable to transfer personal data between and among countries and regions in which we operate, it could affect the manner in which we provide our services, the geographical location or segregation of our relevant systems and operations, and could adversely affect our financial results.

Since the beginning of 2021, after the end of the transition period following the UK's departure from the European Union, we are also subject to the UK data protection regime, which imposes separate but similar obligations to those under the GDPR and comparable penalties, including fines of up to £17.5 million or 4% of a noncompliant company's global annual revenue for the preceding financial year, whichever is greater. As we continue to expand into other foreign countries and jurisdictions, we may be subject to additional laws and regulations that may affect how we conduct business.

Although we work to comply with applicable laws, regulations and standards, our contractual obligations and other legal obligations, these requirements are evolving and may be modified, interpreted and applied in an inconsistent manner from one jurisdiction to another, and may conflict with one another or other legal obligations with which we must comply. Any failure or perceived failure by us or our employees, representatives, contractors, consultants, collaborators, or other third parties to comply with such requirements or adequately address privacy and security concerns, even if unfounded, could result in additional cost and liability to us, damage our reputation, and adversely affect our business and results of operations.

Acquisitions or joint ventures could disrupt our business, cause dilution to our stockholders and otherwise harm our business.

We may acquire other businesses, products or technologies as well as pursue strategic alliances, joint ventures, technology licenses or investments in complementary businesses. We have not made any acquisitions to date, and our ability to do so successfully is unproven. Any of these transactions could be material to our financial condition and operating results and expose us to many risks, including:

- disruption in our relationships with future customers or with current or future distributors or suppliers as a result of such a transaction;
- unanticipated liabilities related to acquired companies;
- additional exposure to cybersecurity risks and vulnerabilities from any newly acquired information technology infrastructure;
- difficulties integrating acquired personnel, technologies and operations into our existing business;
- diversion of management time and focus from operating our business to acquisition integration challenges;
- increases in our expenses and reductions in our cash available for operations and other uses;
- possible write-offs or impairment charges relating to acquired businesses; and
- inability to develop a sales force for any additional product candidates.

Foreign acquisitions involve unique risks in addition to those mentioned above, including those related to integration of operations across different cultures and languages, currency risks and the particular economic, political and regulatory risks associated with specific countries.

Also, the anticipated benefit of any acquisition may not materialize. Future acquisitions or dispositions could result in potentially dilutive issuances of our equity securities, the incurrence of debt, contingent liabilities or amortization expenses or write-offs of goodwill, any of which could harm our financial condition. We cannot predict the number, timing or size of future joint ventures or acquisitions, or the effect that any such transactions might have on our operating results.

We have in the past been subject to securities class action litigation and may be subject to similar or other litigation in the future, which may harm our business.

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 biopharmaceutical companies have experienced significant stock price volatility in recent years. On September 28, 2016, a purported stockholder filed a putative class action lawsuit in the U.S. District Court for the District of Massachusetts against us entitled Mariusz Mazurek v. Seres Therapeutics, Inc., et.al. alleging false and misleading statements and omissions about our clinical trials for our product candidate SER-109 in our public disclosures between June 25, 2015 and July 29, 2016. Although this lawsuit has been dismissed by the court, should we face similar or other litigation again, it could result in substantial costs and a diversion of management's attention and resources, which could harm our business. In addition, the uncertainty of a pending lawsuit or potential filing of additional lawsuits could lead to more volatility and a reduction in our stock price.

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could harm our business.

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and biological materials such as human stool. Our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury, including from the novel coronavirus SARS-CoV-2, which causes the COVID-19 disease, from these materials. In the event of contamination or injury resulting from our use of hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties for failure to comply with such laws and regulations.

Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential

liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological, hazardous or radioactive materials.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research, development or production efforts. Our failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

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

As of December 31, 2021, we had net operating loss carryforwards, or NOLs, of $402.5 million for federal income tax purposes and $394.1 million for state income tax purposes, which may be available to offset our future taxable income, if any. Our federal and state NOLs begin to expire in various amounts in 2035, provided that federal NOLs generated in taxable years after December 31, 2017 will not be subject to expiration. As of December 31, 2021, we also had federal and state research and development and other tax credit carryforwards of approximately $43.7 million and $11.9 million, respectively, available to reduce future income tax liabilities. Our federal and state tax credit carryforwards begin to expire in various amounts in 2031 and 2028, respectively. The federal research and development tax credit carryforwards include an orphan drug credit carryforward of $23.7 million. These NOLs and tax credit carryforwards could expire unused, to the extent subject to expiration, and be unavailable to offset future taxable income or income tax liabilities. In addition, in general, under Sections 382 and 383 of the U.S. Internal Revenue Code of 1986, as amended (the "Code"), a corporation that undergoes an “ownership change” is subject to limitations on its ability to use its pre-change NOLs and tax credit carryforwards to offset future taxable income and income taxes. For these purposes, an ownership change generally occurs where the aggregate change in stock ownership of one or more stockholders or groups of stockholders owning at least 5% of a corporation’s stock exceeds 50 percentage points over a three-year period. We have experienced ownership changes in the past, per the Section 382 study performed through December 31, 2020, and may experience ownership changes in the future because of future transactions in our stock, some of which may be outside our control. We believe that none of the existing tax attributes will expire unused as a result of the calculated limitations. If we undergo future ownership changes, our ability to use our NOLs and tax credit carryforwards could be further limited. For these reasons, we may not be able to use a material portion of our NOLs or tax credit carryforwards, even if we attain profitability. We have recorded a full valuation allowance related to our NOLs and other deferred tax assets due to the uncertainty of the ultimate realization of the future tax benefits of such assets. Federal NOLs arising in periods beginning after December 31, 2017 may generally only be used to offset 80% of taxable income in years beginning after December 31, 2020, which may require us to pay federal income taxes in future years despite generating federal NOLs in prior years.

The terms of our credit facility place restrictions on our operating and financial flexibility. If we raise additional capital through debt financing, the terms of any new debt could further restrict our ability to operate our business.

In October 2019, we entered into a loan and security agreement with Hercules pursuant to which a term loan facility in aggregate principal amount up to $50.0 million, or the Original Credit Facility, is available to us in three tranches, subject to certain terms and conditions. We received the first tranche of $25.0 million upon signing the agreement on October 29, 2019. We did not meet the milestone requirements for the second tranche under the Original Credit Facility, and as such, the additional second tranche amount of up to $12.5 million is not available for us to borrow. We elected not to borrow the third tranche of $12.5 million, which was available upon Hercules’ approval until June 30, 2021. The Original Credit Facility is secured by a lien on substantially all of our assets, other than intellectual property. We also agreed not to pledge or secure our intellectual property to others. In April 2020, we entered into an amendment to the loan and security agreement with Hercules, or the First Amendment, permitting us to enter into a promissory note under the Paycheck Protection Program of the Coronavirus Aid, Relief and Economic Stability Act. In February 2022, we entered into a second amendment to the loan and security agreement with Hercules, or the Second Amendment, which amended the Original Credit Facility. Pursuant to the Second Amendment, term loans in an aggregate principal amount of up to $100.0 million, or the New Credit Facility, have become available to us in five tranches, subject to certain terms and conditions: (i) the first tranche in an aggregate principal amount of $25.0 million that is outstanding as of the February 24, 2022 effective date, or the Effective Date, (ii) the second tranche in an aggregate principal amount of $12.5 million that has been advanced to the Company and is outstanding as of the Effective Date, (iii) the third tranche in an aggregate principal amount of $12.5 million that has been advanced to the Company and is outstanding as of the Effective Date, (iv) the fourth tranche in an aggregate principal amount of $25.0 million available upon satisfaction of certain conditions, including the approval by the FDA of a biologics license application in respect of SER-109 by no later than December 15, 2023, and (v) the fifth tranche in an aggregate principal amount of up to $25.0 million that is available through the amortization date upon satisfaction of certain conditions, including the lenders’ investment committee approval. For a further description of the New Credit Facility, see Part II, Item 9B. “Other Information” in this Annual Report on Form 10-K.

The Original Credit Facility and the New Credit Facility include affirmative and negative covenants and events of default applicable to us. The affirmative covenants include, among others, covenants requiring us to maintain our legal existence and governmental approvals, deliver certain financial reports and maintain insurance coverage. The negative covenants include, among others, restrictions on our transferring collateral, making changes to the nature of our business, incurring additional indebtedness, engaging in mergers or acquisitions, paying dividends or making other distributions, making investments, engaging in transactions with affiliates. The Original Credit Facility and the New Credit Facility also include a conditional liquidity covenant. Events of default include, among other things and subject to customary exceptions: (i) insolvency, liquidation, bankruptcy or similar events; (ii) failure

to pay any debts due under the loan and security agreement with Hercules or other loan documents on a timely basis; (iii) failure to observe certain covenants under the loan and security agreement with Hercules; (v) occurrence of a material adverse effect; (vi) material misrepresentation by us; (vii) occurrence of any default under any other agreement involving material indebtedness; and (viii) certain material money judgments. If we default under the loan and security agreement, Hercules may accelerate all of our repayment obligations and take control of our pledged assets, potentially requiring us to renegotiate our agreement on terms less favorable to us or to immediately cease operations. Further, if we are liquidated, the lenders' right to repayment would be senior to the rights of the holders of our common stock to receive any proceeds from the liquidation. Any declaration by Hercules of an event of default could significantly harm our business and prospects and could cause the price of our common stock to decline. If we raise any additional debt financing, the terms of such additional debt could further restrict our operating and financial flexibility.

Risks Related to Our Common Stock

Our executive officers, directors and principal stockholders, if they choose to act together, have the ability to control or significantly influence all matters submitted to stockholders for approval.

Our executive officers, directors and stockholders who owned more than 5% of our outstanding common stock and their respective affiliates, in the aggregate, hold shares representing approximately 72.8% of our outstanding voting stock. As a result, if these stockholders were to choose to act together, they would be able to control or significantly influence 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 or significantly influence the election of directors and approval of any merger, consolidation or sale of all or substantially all of our assets. This concentration of ownership control may:

- delay, defer or prevent a change in control;
- entrench our management and the board of directors; or
- impede a merger, consolidation, takeover or other business combination involving us that other stockholders may desire.

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

Sales of a substantial number of shares of our 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 common stock. We have also registered and intend to continue to register all shares of 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 volume limitations applicable to affiliates.

We are no longer an "emerging growth company" or a "smaller reporting company" and, as a result we are subject to certain enhanced disclosure requirements.

The last day of the fiscal year following the fifth anniversary of our IPO was December 31, 2020. As a result, commencing January 1, 2021, we are subject to certain requirements that apply to other public companies but did not previously apply to us due to our status as an emerging growth company. Compliance with these enhanced disclosure requirements will increase our costs and could negatively affect our results of operations and financial condition. Moreover, as a large accelerated filer, we are required to comply with the auditor attestation requirements under Section 404 of the Sarbanes Oxley Act of 2002, as amended, or Section 404.

As of December 31, 2021, we are no longer a "smaller reporting company" as defined under the rules promulgated under the Exchange Act. Since we are no longer a smaller reporting company, we are unable to provide simplified executive compensation disclosure or take advantage of certain other reduced disclosure obligations, including, among other things, providing only two years of audited financial statements.

We expect that the loss of smaller reporting company status and compliance with the related additional disclosure requirements will increase our legal and financial compliance costs and cause management and other personnel to divert attention from operational and other business matters to these additional public company reporting requirements.

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 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 stockholders might otherwise receive a premium for their shares. These provisions could also limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our 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;
- 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 certificate of incorporation designates the Court of Chancery of the State of Delaware, subject to certain exceptions, as the sole and exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders and our bylaws designate the federal district courts of the United States as the exclusive forum for actions arising under the Securities Act of 1933, as amended, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our restated certificate of incorporation 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 actions brought against us by stockholders. In addition, our bylaws provide that the federal district courts of the United States are the exclusive forum for any complaint raising 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 and bylaws described above.

We believe these choice of forum 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 provisions may have the effect of discouraging lawsuits against our directors and officers. 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 or bylaws to be inapplicable or unenforceable in such action. If a court were to find the choice of forum provisions contained in our restated certificate of incorporation or bylaws 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 capital stock in the foreseeable future, capital appreciation, if any, will be the sole source of gain for our stockholders.

We have never declared or paid cash dividends on our capital stock. We currently intend to retain all of our future earnings, if any, to finance the growth and development of our business. In addition, our loan and security agreement with Hercules Capital currently prohibits us from paying dividends on our equity securities, and any future debt agreements may likewise preclude us from paying dividends. As a result, capital appreciation, if any, of our common stock will be our stockholders' sole source of gain for the foreseeable future.

General Risk Factors

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

Our stock price is likely to be volatile. Furthermore, the stock market in general and the market for smaller biopharmaceutical companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, our stockholders may not be able to sell their common stock at or above the price they paid for their common stock. The market price for our common stock may be influenced by many factors, including:

- the success of competitive products or technologies;
- actual or anticipated changes in our growth rate relative to our competitors;
- results of clinical trials of our product candidates or those of our competitors;
- developments related to any future collaborations;
- regulatory or legal developments in the United States and other countries;
- development of new product candidates that may address our markets and may make our product candidates less attractive;
- changes in physician, hospital or healthcare provider practices that may make our product candidates less useful;
- announcements by us, our collaborators or our competitors of significant acquisitions, strategic partnerships, joint ventures, collaborations or capital commitments;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- the level of expenses related to any of our product candidates or clinical development programs;
- failure to meet or exceed financial estimates and projections of the investment community or that we provide to the public;
- the results of our efforts to discover, develop, acquire or in-license additional product candidates or products;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- general economic, industry and market conditions; and
- the other factors described in this "Risk Factors" section.

If securities or industry analysts issue an adverse or misleading opinion regarding our business, our common stock price and trading volume could decline.

The trading market for our common stock is influenced by the research and reports that industry or securities analysts publish about us or our business. If any of the analysts who cover us issue an adverse or misleading opinion regarding us, our business model, our intellectual property or our stock performance, or if our clinical studies and operating results fail to meet the expectations of analysts, our stock price would likely decline. If one or more of these analysts cease coverage of us or fail 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.

We will continue to incur costs as a result of being a public company, and our management will continue to devote substantial time to compliance initiatives and corporate governance practices.

As a public company, we have incurred and will continue to incur significant legal, accounting and other expenses, particularly now that we are no longer an emerging growth company or a smaller reporting company. The Sarbanes-Oxley Act of 2002, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the listing requirements of The Nasdaq Global Select 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 devote and will need to continue to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations have increased and will continue to increase our legal and financial compliance costs and make some activities more time-consuming and costly. For example, we expect that these rules and regulations will continue to make it more difficult and more expensive for us to maintain 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.

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 future uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices.

If we fail to maintain an effective system of internal control over financial reporting, we may not be able to accurately report our financial results or prevent fraud. As a result, stockholders could lose confidence in our financial and other public reporting, which would harm our business and the trading price of our common stock.

Effective internal control over financial reporting is necessary for us to provide reliable financial reports and, together with adequate disclosure controls and procedures, is designed to prevent fraud. Any failure to implement required new or improved controls, or difficulties encountered in their implementation could cause us to fail to meet our reporting obligations.

Pursuant to Section 404, we are required to furnish a report by our management on our internal control over financial reporting. Additionally, we are no longer a non-accelerated filer, so we are required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. If we are unable to maintain effective internal control over financial reporting, we may not have adequate, accurate or timely financial information, and we may be unable to meet our reporting obligations as a public company or comply with the requirements of the Securities and Exchange Commission or Section 404. This could result in a restatement of our financial statements, the imposition of sanctions, including the inability of registered broker dealers to make a market in our common stock, or investigation by regulatory authorities. Any such action or other negative results caused by our inability to meet our reporting requirements or comply with legal and regulatory requirements or by disclosure of an accounting, reporting or control issue could adversely affect the trading price of our securities and our business. Material weaknesses in our internal control over financial reporting could also reduce our ability to obtain financing or could increase the cost of any financing we obtain. This could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Research and Offices

Our corporate headquarters is located in Cambridge, Massachusetts, where we lease approximately 83,396 square feet of office, laboratory, and pilot manufacturing space under a lease that expires in November 2023.

Clinical Manufacturing

We currently conduct part of our manufacturing operations in our leased facilities in Cambridge, Massachusetts, which contain manufacturing facilities for clinical products. We believe our current laboratory facilities and contract relationships are sufficient to meet our current bioprocess development and manufacturing needs. Product candidates may be brought into the facilities for economies of operation, or may remain external with contract manufacturing organizations, depending on business dynamics and development needs.

We plan to control the production of all products under current good manufacturing practices by making strategic investments in manufacturing, which may include collaborations with third parties, the design and renovation of existing facilities and the construction of additional new facilities for commercial supply.

Item 3. Legal Proceedings

Opposition Proceeding

On October 19, 2016, the European Patent Office granted European Patent No. 2 575 835 B1 to The University of Tokyo. On April 25, 2017, we filed a notice of opposition to this patent in the European Patent Office, requesting that it be revoked in its entirety for the reasons set forth in our opposition. The oral proceedings were held at the European Patent Office on February 18, 2019 and the Opposition Division required The University of Tokyo to narrow the scope of the claims of the patent. The University of Tokyo has appealed certain aspects of the Opposition Division's decision, as have we and other opponents.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

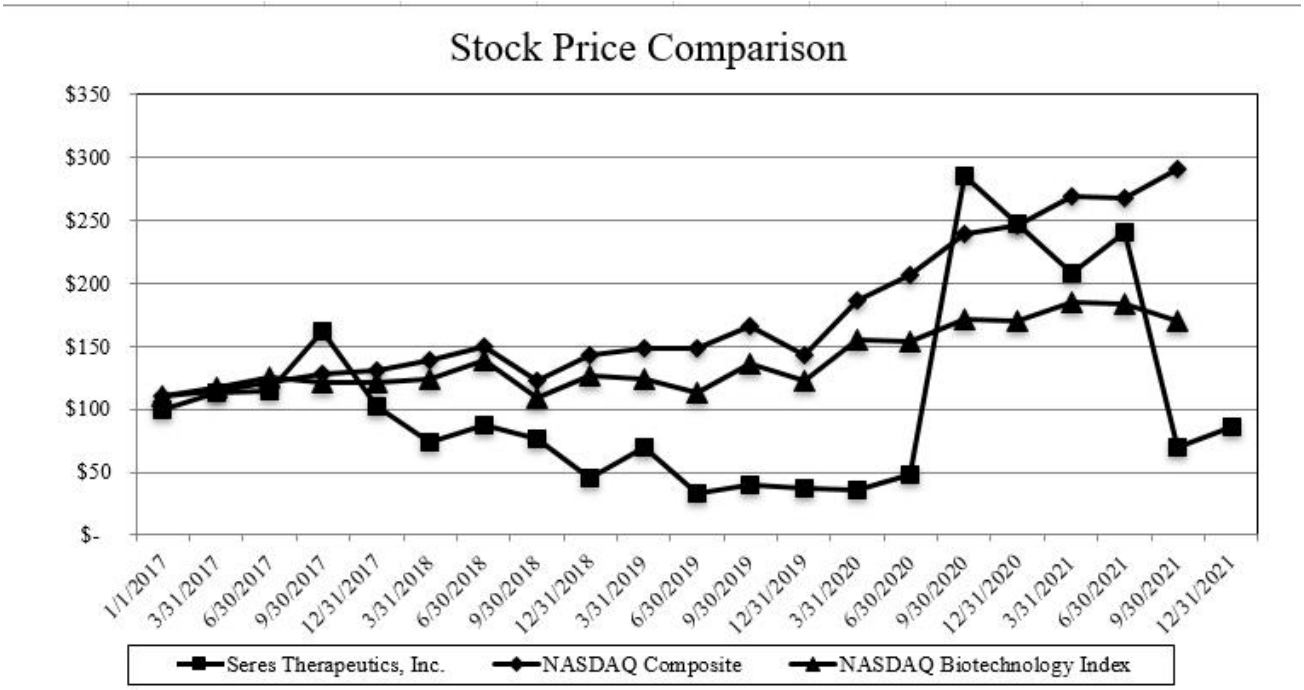
Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Market Information

Our common stock has been publicly traded on the Nasdaq Global Select Market under the symbol "MCRB" since June 26, 2015. Prior to that time, there was no public market for our common stock.

Stock Performance Graph

The graph set forth below compares the cumulative total stockholder return on our common stock between January 1, 2017 and December 31, 2021, with the cumulative total return of (a) the Nasdaq Biotechnology Index and (b) the Nasdaq Composite Index, over the same period. This graph assumes the investment of $100 on December 31, 2016 in each of our common stock, the Nasdaq Biotechnology Index and the Nasdaq Composite Index and assumes the reinvestment of dividends, if any. The comparisons reflected in the graph and table are not intended to forecast the future performance of our stock and may not be indicative of our future performance.



Holders

As of February 24, 2022, there were approximately 10 holders of record of our common stock. The actual number of stockholders is greater than this number of record holders, and includes stockholders who are beneficial owners, but whose shares are held in street name by brokers and other nominees. The number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

Dividends

We have not paid any cash dividends on our common stock since inception and do not anticipate paying cash dividends in the foreseeable future. In addition, our loan and security agreement with Hercules Capital currently prohibits us from paying dividends on our equity securities, and any future debt agreements may likewise preclude us from paying dividends. See "Management's Discussion and Analysis of Financial Condition and Results of Operations – Liquidity and Capital Resources."

Recent Sales of Unregistered Securities

We did not make any sales of unregistered securities during the quarter ended December 31, 2021.

Purchases of Equity Securities by the Issuer or Affiliated Purchasers

There were no repurchases of shares of common stock made during the quarter ended December 31, 2021.

Item 6. [Reserved]

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

You should read the following discussion and analysis of financial condition and results of operations together with our consolidated financial statements and related notes included elsewhere in this Annual Report on Form 10-K. This discussion and other parts of this Annual Report on Form 10-K contain forward-looking statements that involve risks and uncertainties, such as statements regarding our plans, objectives, expectations, intentions and projections. Our actual results could differ materially from those discussed in these forward-looking statements. Important factors that could cause or contribute to such differences include, but are not limited to, those discussed in "Summary Risk Factors" and Part I and Item 1A. "Risk Factors" of this Annual Report on Form 10-K.

A discussion regarding our financial condition and results of operations for the years ended December 31, 2021 and 2020, including a year-to-year comparison between 2021 and 2020, is presented below. For a discussion regarding our financial condition and results of operations for the year ended December 31, 2019, including a year-to-year comparison between 2020 and 2019, refer to Part II, Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our Annual Report on Form 10-K for the fiscal year ended December 31, 2020, filed with the SEC on March 2, 2021.

Overview

We are a microbiome therapeutics company developing a novel class of live biotherapeutic drugs, which are consortia of microbes designed to treat disease by modulating the microbiome to treat or reduce disease by repairing the function of a disease susceptible microbiome to a non-disease state. We have an advanced drug pipeline with late-stage clinical assets that are formulated for oral delivery and a differentiated microbiome therapeutics drug discovery and development platform including good manufacturing practices, or GMP, manufacturing capabilities for this novel drug modality.

Our highest priority is preparing a biologics license application, or BLA, for submission to the U.S. Food and Drug Administration, or FDA, and preparing for potential commercialization of SER-109, an investigational oral microbiome therapeutic in development for recurrent *Clostridioides difficile infection*, or CDI. We intend to seek agreement with the FDA to begin a rolling BLA submission for SER-109 in the first half of 2022 and to finalize the submission with data from the safety database in mid-2022. SER-109 has obtained Breakthrough Therapy designation, and as a result, we expect priority review by the FDA.

We are also designing microbiome therapeutics to decolonize pathogens and modulate host function to reduce and prevent infections. We believe that the scientific and clinical data from our SER-109 program validate this novel approach, which we refer to as infection protection. We believe the infection protection approach may be replicable across different bacterial pathogens to develop microbiome therapeutics with the potential to protect a range of medically compromised patients from infections. We are evaluating SER-155 in a Phase 1b study in patients receiving allogeneic hematopoietic stem cell transplantation, or allo-HSCT, to reduce incidences of gastrointestinal infections, bloodstream infections and graft-versus-host disease, or GvHD. We are also evaluating additional preclinical stage programs in indications such as cancer neutropenia, solid organ transplant, and antimicrobial resistant infections more broadly.

We continue to focus our resources on evaluating SER-301 in a Phase 1b study in patients with mild-to-moderate ulcerative colitis, or UC, and on analyzing additional biomarker data from our Phase 2b study evaluating SER-287 in patients with mild-to-moderate UC. In July 2021, we announced topline results from the SER-287 Phase 2b study, which did not meet its primary endpoint of improving clinical remission rates compared to placebo. Following the data readout, in December 2021, we completed preliminary microbiome drug pharmacology analyses that demonstrated the successful engraftment of SER-287 bacterial species. However, unlike the Phase 1b study, anticipated changes in disease-relevant metabolites post-administration with SER-287 in the Phase 2b study were not observed. In addition, we have completed preliminary analysis of data from the first cohort of the SER-301 Phase 1b study, which included 15 subjects. Evaluation of the first cohort data by an independent Data Safety Monitoring Board indicated that it would be safe to proceed to the placebo-controlled second cohort. While efficacy was not a defined endpoint in the first cohort, evaluation of clinical outcome data collected as part of the study indicated that no subjects in the first cohort achieved clinical remission as defined by the FDA using the Three-Component Modified Mayo Score after 10 weeks of treatment, though there were improvements in one or more individual components (endoscopic, stool frequency and rectal bleeding subscores) in some patients. Strains in SER-301 were observed to engraft in subjects across the trial period, and based on the assessment of metabolomic data, SER-301 demonstrated pharmacological properties consistent with its design and led to baseline-dependent modulation of the metabolic landscape in the gastrointestinal tract of patients treated. We continue to conduct analyses of data from our SER-287 and SER-301 UC clinical stage programs to inform next steps for further development.

In addition, we continue to evaluate opportunities to advance our technology in modulating host immunity to have an impact on and treat diseases such as cancer and various autoimmune diseases.

Since our inception in October 2010, we have devoted substantially all of our resources to developing our programs, platforms, and technologies, building our intellectual property portfolio, developing our supply chain, business planning, raising capital and providing general and administrative support for these operations.

Many of our product candidates are still in preclinical development or early-stage discovery. Our ability to generate product revenue sufficient to achieve profitability will depend heavily on the successful development and eventual commercialization of one

or more of our product candidates. Since our inception, we have incurred significant operating losses. Our net loss was $65.6 million for the year ended December 31, 2021. As of December 31, 2021, we had an accumulated deficit of $614.4 million and cash, cash equivalents and short- and long-term investments totaling $291.2 million. Based on our current plans and forecasted expenses, we believe that our existing cash, cash equivalents and investments as of December 31, 2021 and proceeds, net of facility fees and expenses, of $27.6 million received in February 2022 in connection with the Second Amendment, will enable us to fund our operating expenses, debt service obligations and capital expenditure requirements for at least the next 12-months from issuance of our consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

While we plan to focus our investment on our highest priority clinical programs in the near-term, our expenses may increase substantially in connection with our ongoing and planned activities, particularly as we:

- complete the clinical development, seek regulatory approval, and prepare for commercialization of SER-109 for patients with recurrent CDI;
- re-evaluate the clinical development of SER-287 for the treatment of UC in light of the Phase 2b clinical study results and in conjunction with the additional microbiome biomarker data;
- continue the clinical development of SER-301 for the treatment of UC;
- continue the clinical development of SER-155 to address gastrointestinal infections, bacteremia and graft-versus-host disease;
- make strategic investments in our research discovery and development platforms and capabilities, including identifying candidates for additional disease indications;
- make strategic investments in manufacturing capabilities;
- maintain and augment our intellectual property portfolio and opportunistically acquire complementary intellectual property;
- potentially establish a sales and distribution infrastructure and scale-up manufacturing capabilities to commercialize any products for which we may obtain regulatory approval;
- perform our obligations under our agreements with our collaborators;
- seek to obtain regulatory approvals for our product candidates; and
- experience any delays or encounter any issues with any of the above, including but not limited to failed studies, complex results, safety issues or other regulatory challenges.

In addition, if we obtain marketing approval for any of our product candidates, we expect to incur significant commercialization expenses related to product manufacturing, marketing, sales and distribution. Furthermore, we expect to continue to incur additional costs associated with operating as a public company.

As a result, we will need additional financing to support our continuing operations. Until such time as we can generate significant revenue from product sales, if ever, we expect to finance our operations through a combination of public or private equity or debt financings or other sources, which may include collaborations with third parties. Adequate additional financing may not be available to us on acceptable terms, or at all. For example, the trading prices for our and other biopharmaceutical companies' stock have been highly volatile as a result of the COVID-19 pandemic. As a result, we may face difficulties raising capital through sales of our common stock and any such sales may be on unfavorable terms. Our inability to raise capital as and when needed would have a negative impact on our financial condition and our ability to pursue our business strategy. We will need to generate significant revenue to achieve profitability, and we may never do so.

Impact of the COVID-19 Pandemic

We are monitoring the ongoing impacts of the COVID-19 pandemic and have taken steps to identify and mitigate the adverse impacts on, and risks to, our business posed by its spread and actions taken by governmental and health authorities to address it. The spread of COVID-19 has caused us to modify our business practices, including implementing a work from home policy for all employees who are able to perform their duties remotely and restricting all nonessential travel, and we expect to continue to take actions as may be required or recommended by government authorities or as we determine are in the best interests of our employees, and other business partners in light of COVID-19. The impact of COVID-19 on our future results will largely 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 and severity of the pandemic, the impact of variants, travel restrictions and social distancing recommendations and regulations in the United States and other countries, business closures or business disruptions, the ultimate impact on financial markets and the global economy, the effectiveness and uptake of vaccines and vaccine distribution efforts and the effectiveness of other actions taken in the United States and other countries to contain and treat the disease. See "Risk Factors—Risks Related to Our Operations—The COVID-19 pandemic has adversely impacted and could continue to adversely impact, our business, including our

preclinical studies and clinical trials, results of operations and financial condition" in Part I, Item 1A of this Annual Report on Form 10-K.

SER-109

SER-109 is an oral microbiome therapeutic candidate consisting of a consortium of purified Firmicutes spores. The SER-109 manufacturing purification process is designed to remove unwanted microbes in an effort to reduce the risk of pathogen transmission beyond donor screening alone. SER-109 is designed to reduce recurrent CDI in patients with a history of CDI by modulating the microbiome to a state that resists *C. difficile* germination and growth. SER-109, if approved, is designed to treat individuals with recurrent CDI, a patient population which includes approximately 170,000 cases per year in the United States.

The Phase 3 ECOSPOR III study was a multicenter, randomized, placebo-controlled study that enrolled 182 patients with multiply recurrent CDI. All patients who entered ECOSPOR III must have tested positive for *C. difficile* toxin. This inclusion criterion was implemented in an effort to ensure enrollment of only patients with active infection rather than simple colonization. The study was designed to evaluate patients for 24 weeks, with the primary endpoint comparing the *C. difficile* recurrence rate in subjects who received SER-109 verses placebo at up to eight weeks after dosing.

Previously reported topline data demonstrated that the study achieved its primary endpoint where SER-109 was superior to placebo in reducing CDI recurrence at eight weeks, reflecting a sustained clinical response rate of approximately 88% at eight weeks post-treatment. SER-109 resulted in a 27% absolute reduction of recurrence of CDI compared to placebo at eight weeks post-treatment, which is a relative risk reduction of 68%. The number-needed-to treat was 3.6. The rate of recurrence at 12 weeks in the SER-109 arm was 18.0%, compared to a rate of 46.2% in the placebo arm, representing an absolute risk reduction of 28% (relative risk 0.40; 95% CI 0.24-0.65; $p < 0.001$ and $p < 0.002$ for the test sequence), and thereby consistent with the results seen at eight weeks. Results across stratifications of age and antibiotics remained similar. The study's efficacy results related to the primary endpoint from all analyses exceeded the statistical threshold previously provided in consultation with the FDA that could allow this single clinical study to fulfill efficacy requirements for a BLA. The efficacy remained durable through 24 weeks of follow-up, as SER-109 was observed to significantly reduced recurrence rates compared to placebo over 24 weeks, 21.3% vs. 47.3%, respectively. In January 2022, these data were published in the *New England Journal of Medicine* (N Engl J Med 2022;386(3):220-229).

We believe the SER-109 safety results across completed studies have been favorable, with an adverse event profile comparable to placebo. In September 2021, we achieved target enrollment of 300 subjects with the ECOSPOR IV open-label study. The target enrollment of a minimum of 300 subjects for the SER-109 safety database was reached in conjunction with a prior completed Phase 3 study, ECOSPOR III. Seres is required by the FDA to demonstrate safety of SER-109 in at least 300 subjects who have received the dose to be commercialized, consistent with standard FDA guidance, with a 24-week follow-up period, to support a BLA submission. The ECOSPOR IV open-label study includes patients with recurrent CDI, including individuals with a first recurrence of CDI. We intend to seek agreement with the FDA to begin a rolling BLA submission for SER-109 in the first half of 2022 and finalize the submission with data from the safety database in mid-2022. SER-109 has obtained Breakthrough Therapy designation, and as a result, we expect priority review by the FDA.

In November 2021, we initiated a SER-109 expanded access program across the United States. The program is designed to enable eligible adults with recurrent CDI to obtain access to SER-109 prior to a potential FDA product approval.

SER-155

SER-155, an oral microbiome therapeutic candidate consisting of a consortium of cultivated bacteria, is designed to decrease infection and translocation of antibiotic resistant bacteria in the gastrointestinal tract and modulate host immune responses to decrease GvHD. The rationale for this program is based in part on published clinical evidence from our collaborators at Memorial Sloan Kettering Cancer Center showing that allo-HSCT patients with decreased diversity of commensal microbes are significantly more likely to die due to infection and/or lethal GvHD. SER-155 was designed using our reverse translational discovery platform to reduce incidences of gastrointestinal infections, bloodstream infections and GvHD in patients receiving allo-HSCT. The SER-155 Phase 1b study is designed to include approximately 70 patients in both an open-label and a randomized, double-blind, placebo-controlled cohort that will evaluate safety and tolerability before and after HSCT. Additionally, the engraftment of SER-155 bacteria (a measure of pharmacokinetics) and the efficacy of SER-155 in preventing infections and GvHD will be evaluated. In November 2021, we enrolled the first patient in the SER-155 Phase 1b study.

SER-287

SER-287, an oral microbiome therapeutic candidate consisting of a consortium of purified Firmicutes spores, is designed to restore a healthy gastrointestinal microbiome in individuals with UC. There are over 700,000 UC patients in the United States and fewer than one-third of patients on current therapies achieve remission. Approved treatments are often inadequate to control disease activity and are often associated with significant side effects, including immunosuppression. SER-287 has been granted Fast Track Designation by the FDA for the induction and maintenance of clinical remission in adult subjects with active mild-to-moderate UC. SER-287 has been designated an Orphan Drug for pediatric UC by the FDA.

In July 2021, we announced topline results from the Phase 2b study evaluating SER-287 in patients with mild-to-moderate UC. The study did not meet its primary endpoint of improving clinical remission rates compared to placebo. The primary objective of the induction portion of the Phase 2b study was to evaluate the safety and efficacy of SER-287, after 10 weeks of induction dosing (following vancomycin pre-conditioning) in achieving clinical remission in participants with mild-to-moderate UC. The trial was a randomized, placebo controlled, double blind, parallel group multicenter study which enrolled 203 UC patients at approximately 100 sites throughout the U.S. and Canada. Dosing was explored in two SER-287 cohorts (full induction dose and step-down induction dose) versus placebo and patients were randomized according to a 1:1:1 ratio. Clinical remission was analyzed and defined by a 3-component modified Mayo Score. No statistically significant differences were observed in absolute clinical remission rates between the three treatment arms (10.3% for the full induction dose, n=68 and 10.6% for the step-down induction dose, n=66 versus 11.6% for placebo, n=69). There were also no statistically significant differences observed across the three treatment groups for endoscopic improvement, endoscopic remission or symptomatic remission.

Both dosing regimens of SER-287 were generally well tolerated. Treatment emergent adverse events, or AEs, were observed in 67.6%, 46.2% and 50.7% of subjects in the induction dose, step-down dose (both of which included six days of oral vancomycin preconditioning) and placebo treatment arms, respectively. The majority of observed AEs were mild or moderate in severity. The most commonly observed AEs were UC, diarrhea, nausea and abdominal distension. Four participants on active treatment reported serious treatment emergent adverse events (worsening UC, colonic dysplasia, congestive heart failure with decreased hemoglobin, and appendicitis), as did one on placebo (worsening UC).

Given the lack of a clinical efficacy signal identified in the Phase 2b study, we have closed the open label and maintenance portions of the study.

In December 2021, we completed preliminary microbiome drug pharmacology analyses from the Phase 2b study that demonstrated the successful engraftment of SER-287 bacterial species. Based on the SER-287 Phase 2b microbiome data analyses, engraftment of SER-287 bacteria, measured as the median number of bacteria observed across patients post treatment, was statistically significant in patients receiving SER-287 versus placebo ($p \leq 0.001$ at all timepoints). The magnitude and kinetics of engraftment were comparable to our Phase 1b study. However, unlike the Phase 1b study, anticipated changes in disease-relevant metabolites post-administration with SER-287 in the Phase 2b study were not observed. Analysis of the genomic and metabolomic data characterizing the microbiome of SER-287 study participants at baseline and post dosing suggest potential biomarkers for inclusion of targeted patient subpopulations in future development efforts.

We continue to conduct analyses of data from our SER-287 and SER-301 UC clinical stage programs to inform next steps for further development.

SER-301

SER-301 is an oral microbiome therapeutics candidate comprised of a consortium of cultivated bacteria for the treatment of mild-to-moderate UC. SER-301 is a consortium of cultivated bacteria designed using our reverse translational discovery platform that incorporates analysis of microbiome biomarkers from human clinical data and preclinical assessments using human cell-based assays and *in vitro/ex vivo* and *in vivo* disease models. The design of SER-301 incorporates insights obtained from the SER-287 Phase 1b clinical and microbiome results, as well as from our clinical portfolio more broadly, and additional functional data from preclinical assessments, in an effort to optimize desired pharmacological properties.

SER-301 is designed to reduce induction of pro-inflammatory activity, improve epithelial barrier integrity and TNF-α driven inflammation in intestinal epithelial cells, or IECs, and modulate UC-relevant anti-inflammatory, innate and adaptive immune pathways. SER-301 is being produced by our advanced fermentation, formulation and delivery platforms. It includes strains delivered in spore form, as well as strains fermented in non-spore (vegetative) form and delivered using enterically-protected technology designed to release in the colon.

The SER-301 Phase 1b study is being conducted in Australia and New Zealand in subjects with mild-to-moderate UC and is designed to include approximately 65 patients distributed across two cohorts. In November 2020 we enrolled the first patient in the SER-301 Phase 1b study. As a result of enrolling the first patient in the clinical study, we received a $10.0 million milestone payment under our collaboration and license agreement, or the 2016 License Agreement, with Société des Produits Nestlé S.A., or, together with NHSc Pharma Partners, Nestlé, successor in interest to Nestec, Ltd.

We have completed preliminary analysis of data from the first cohort of the SER-301 Phase 1b study, which included 15 subjects. Evaluation of the first cohort data by an independent Data Safety Monitoring Board indicated that it would be safe to proceed to the placebo-controlled second cohort. While efficacy was not a defined endpoint in the first cohort, evaluation of clinical outcome data collected as part of the study indicated that no subjects in the first cohort achieved clinical remission as defined by the FDA using the Three-Component Modified Mayo Score after 10 weeks of treatment, though there were improvements in one or more individual components (endoscopic, stool frequency and rectal bleeding subscores) in some patients. Strains in SER-301 were observed to engraft in subjects across the trial period with the number of engrafting strains exceeding expectations at multiple sampling time points. A dual formulation was evaluated in the first cohort and the extent of engraftment across subjects was correlated with whether

bacteria were formulated as bacterial spores versus vegetative strains; the former demonstrating stronger engraftment across all patients.

Based on the assessment of metabolomic data, SER-301 demonstrated pharmacological properties consistent with its design and led to baseline-dependent modulation of the metabolic landscape in the gastrointestinal tract of patients treated; changes were observed in short-chain and medium-chain fatty acids, tryptophan-derived metabolites, bile acids, and other microbe-associated metabolites, as well as host metabolites associated with a non-disease state. These SER-301 metabolomic results were encouraging compared with the results observed in the SER-287 Phase 2b study, in which the metabolic changes were not observed in general across subjects administered with SER-287. Additionally, changes in disease-relevant metabolites in SER-301 were observed to be greater in a definable subpopulation of patients.

The degree of metabolic changes observed following SER-301 administration appeared to be dependent on the baseline metabolic profile of the study subjects, providing support for the potential for microbiome therapeutics to be developed in biomarker-identified UC patient subpopulations.

We continue to conduct analyses of data from our SER-287 and SER-301 UC clinical stage programs to inform next steps for further development.

SER-401

In March 2021, we announced that we, in collaboration with study partners, The Parker Institute for Cancer Immunotherapy and The University of Texas MD Anderson Cancer Center, voluntarily discontinued further enrollment of our study evaluating the safety and drug activity of SER-401 or fecal microbiota transplant, or FMT, in combination with nivolumab in patients with metastatic melanoma.

A preliminary analysis of results from 10 subjects who received either SER-401 or placebo in combination with nivolumab indicated that SER-401 was safe and well-tolerated. There were no patients enrolled in the FMT portion of the study. Subjects currently enrolled in the study will complete the study protocol. Given challenges in enrollment due to the COVID-19 pandemic, subsequent anticipated time to study completion, and progress in our preclinical oncology pipeline, we have decided to deprioritize further development of SER-401. We will continue to advance our research and development efforts in cancer, applying learnings from the SER-401 trial.

Intellectual Property

Patent Portfolio

We have an extensive patent portfolio directed to rationally designed ecologies of spores and microbes. The portfolio includes both company-owned patents and applications, and those that we have rights to as licensee. For example, our portfolio includes an option to license foundational intellectual property related to the use of bacteria in combination with checkpoint inhibitors from MD Anderson. The patents and applications included in our portfolio cover both composition of matter and methods (*e.g.*, method of treating). Our intellectual property rights related to SER-109 (*C. difficile*) and SER-287 (ulcerative colitis) extend through 2034. We plan on continuing to broaden our patent portfolio. Currently, we have 24 active patent application families, which includes 21 nationalized applications and three pending at the PCT stage. To date, we have obtained 18 issued U.S. patents and one U.S. patent application that has been allowed.

Regulatory Exclusivity

If we obtain marketing approval for any of our product candidates, we expect to receive marketing exclusivity against biosimilar products. For a new biological composition approved by the FDA, a 12-year period of exclusivity in the United States may be obtained. In Europe, the European Medicines Agency awards 10 years of exclusivity for new molecular entities.

Financial Operations Overview

Revenue

To date we have not generated any revenues from the sale of products. Our revenues have been derived primarily from our agreements with our collaborators. See “—Liquidity and Capital Resources.”

Operating Expenses

Our operating expenses since inception have consisted primarily of research and development activities and general and administrative costs.

Research and Development Expenses

Research and development expenses consist primarily of costs incurred for our research activities, including our discovery efforts and the development of our product candidates, which include:

- expenses incurred under agreements with third parties, including contract research organizations, or CROs, that conduct research, pre-clinical activities and clinical trials on our behalf as well as contract manufacturing organizations that manufacture drug products for use in our pre-clinical and clinical trials;
- salaries, benefits and other related costs, including stock-based compensation expense, for personnel in our research and development functions;
- costs of outside consultants, including their fees, stock-based compensation and related travel expenses;
- the cost of laboratory supplies and acquiring, developing and manufacturing pre-clinical study and clinical trial materials;
- costs related to compliance with regulatory requirements; and
- facility-related expenses, which include direct depreciation costs and allocated expenses for rent and maintenance of facilities and other operating costs.

We expense research and development costs as incurred. We recognize external development costs based on an evaluation of the progress to completion of specific tasks using information provided to us by our vendors and our clinical investigative sites. Payments for these activities are based on the terms of the individual agreements, which may differ from the pattern of costs incurred, and are reflected in our financial statements as prepaid or accrued research and development expenses.

Our primary focus of research and development since inception has been on our microbiome therapeutics platform and the subsequent development of our product candidates. Our direct research and development expenses are tracked on a program-by-program basis and consist primarily of external costs, such as fees paid to investigators, consultants, CROs in connection with our pre-clinical studies and clinical trials, lab supplies and consumables, and regulatory fees. We do not allocate employee-related costs and other indirect costs to specific research and development programs because these costs are deployed across multiple product programs under development and, as such, are classified as costs of our microbiome therapeutics platform research, along with external costs directly related to our microbiome therapeutics platform.

Research and development activities are central to our business model. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials. We expect that our research and development expenses will continue to increase in the foreseeable future as we complete clinical development, seek regulatory approval, and prepare for commercialization of SER-109, re-evaluate the clinical development of SER-287, continue to discover and develop additional product candidates, including SER-301 and SER-155 and pursue later stages of clinical development of our product candidates.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and other related costs, including stock-based compensation, for personnel in our executive, finance, corporate, commercial, and business development and administrative functions. General and administrative expenses also include legal fees relating to patent and corporate matters; professional fees for accounting, auditing, tax and consulting services; insurance costs; travel expenses; and facility-related expenses, which include direct depreciation costs and allocated expenses for rent and maintenance of facilities and other operating costs.

We expect that our general and administrative expenses will increase in the future as we increase our headcount to support the potential growth in our research and development activities and the potential commercialization of our product candidates, and as we conduct pre-launch activities to prepare for commercialization of SER-109. We also may continue to incur increased expenses associated with being a public company, including increased costs of accounting, audit, legal, regulatory and tax-related services associated with maintaining compliance with exchange listing and the requirements of the Securities and Exchange Commission, director and officer insurance costs and investor and public relations costs.

Collaboration (Profit) Loss Sharing - related party

Collaboration (profit) loss sharing – related party includes 50% sharing of the profit or loss related to the pre-launch activities and commercialization activities associated with the license agreement that we entered into with NHSc Pharma Partners (Nestle) in July 2021 as discussed in Note 12 to our consolidated financial statements.

Other (Expense) Income, Net

Interest (Expense) Income, Net

Interest income consists of interest earned on our cash, cash equivalents and investments.

Interest expense consists of interest incurred under our loan and security agreement with Hercules.

Other (Expense) Income

Other (expense) income primarily consists of amortization of premiums on investments, offset by sublease income.

Income Taxes

Since our inception in 2010, we have not recorded any U.S. federal or state income tax benefits for the net losses we have incurred in each year or our earned research and development tax credits, due to our uncertainty of realizing a benefit from those items. As of December 31, 2021, we had federal and state net operating loss carryforwards of $402.5 million and $394.1 million, respectively, both of which begin to expire in 2035. As of December 31, 2021, we also had federal and state research and development tax credit carryforwards of $43.7 million and $11.9 million, respectively, which begin to expire in 2031 and 2028, respectively. The federal research and development tax credits include an orphan drug credit carryforward of $23.7 million.

Critical Accounting Policies and Significant Judgments and Estimates

Our consolidated financial statements are prepared in accordance with generally accepted accounting principles, or GAAP, in the United States. The preparation of our consolidated financial statements and related disclosures requires us to make estimates and assumptions that affect the reported amount of assets, liabilities, revenue, costs and expenses and related disclosures. We believe that the estimates and assumptions involved in the accounting policies described below may have the greatest potential impact on our consolidated financial statements and, therefore, consider these to be our critical accounting policies. We evaluate our estimates and assumptions on an ongoing basis. Our actual results may differ from these estimates under different assumptions and conditions.

Revenue Recognition

We recognize revenue in accordance with the guidance under ASC 606, *Revenue from Contracts with Customers*. ASC 606 applies to all contracts with customers, except those contracts that are within the scope of other guidance, such as leases, insurance, and financial instruments. We enter into agreements that are within the scope of ASC 606, under which we license certain of our product candidates and perform research and development services in connection with such arrangements. The terms of these arrangements typically include payment of one or more of the following: nonrefundable up-front fees, reimbursement of research and development costs, development, clinical, regulatory and commercial sales milestone payments, and royalties on net sales of licensed products. Under ASC 606, we recognize revenue when our customer obtains control of promised goods or services, in an amount that reflects the consideration which we expect to receive in exchange for those goods or services. When determining the timing and extent of revenue recognition for arrangements that we determine are within the scope of ASC 606, we perform the following five steps:

(i) identify the contract(s) with a customer;

(ii) identify the performance obligation(s) in the contract;

(iii) determine the transaction price;

(iv) allocate the transaction price to the performance obligation(s) in the contract; and

(v) recognize revenue when (or as) the entity satisfies a performance obligation.

We only apply the five-step model to contracts when it is probable that we will collect the consideration to which we are entitled in exchange for the goods or services transferred to our customer.

At contract inception, once the contract is determined to be within the scope of ASC 606, we assess the goods or services promised within the contract to determine whether each promised good or service is a performance obligation. The promised goods or services in our arrangements typically consist of a license to our intellectual property and/or research and development services. We may provide options to additional items in such arrangements, which are accounted for as separate contracts when our customer elects to exercise such options, unless the option provides a material right to our customer. Performance obligations are promises in a contract to transfer a distinct good or service to our customer that (i) our customer can benefit from on its own or together with other readily available resources, and (ii) is separately identifiable from other promises in the contract. Goods or services that are not individually distinct performance obligations are combined with other promised goods or services until such combined group of promises meets the requirements of a performance obligation.

We determine transaction price based on the amount of consideration we expect to receive for transferring the promised goods or services in the contract. Consideration may be fixed, variable, or a combination of both. At contract inception for arrangements that include variable consideration, we estimate the probability and extent of consideration we expect to receive under the contract utilizing either the most likely amount method or expected amount method, whichever best estimates the amount expected to be received. We then consider any constraints on the variable consideration and include in the transaction price variable consideration to the extent it is deemed probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved.

We then allocate the transaction price to each performance obligation based on the relative standalone selling price and recognize as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) control is transferred to our customer and the performance obligation is satisfied. For performance obligations which consist of licenses and

other promises, we utilize judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress. We evaluate the measure of progress each reporting period and, if necessary, adjust the measure of performance and related revenue recognition.

We record amounts as accounts receivable when the right to consideration is deemed unconditional. When consideration is received, or such consideration is unconditionally due, from our customer prior to transferring goods or services to our customer under the terms of a contract, a contract liability is recorded for deferred revenue.

We do not assess whether a contract has a significant financing component if the expectation at contract inception is that the period between payment by our customer and the transfer of the promised goods or services to our customer will be one year or less. Incremental costs of obtaining a contract are expensed as and when incurred if the expected period over which we would have amortized the asset is one year or less, or the amount is immaterial.

Collaboration Revenue

Arrangements with collaborators may include licenses to intellectual property, research and development services, manufacturing services for clinical and commercial supply, and participation on joint steering committees. We evaluate the promised goods or services to determine which promises, or group of promises, represent performance obligations. In contemplation of whether a promised good or service meets the criteria required of a performance obligation, we consider the stage of development of the underlying intellectual property, the capabilities and expertise of our customer relative to the underlying intellectual property, and whether the promised goods or services are integral to or dependent on other promises in the contract. When accounting for an arrangement that contains multiple performance obligations, we must develop judgmental assumptions, which may include market conditions, reimbursement rates for personnel costs, development timelines and probabilities of regulatory success to determine the stand-alone selling price for each performance obligation identified in the contract.

When we conclude that a contract should be accounted for as a combined performance obligation and recognized over time, we must then determine the period over which revenue should be recognized and the method by which to measure revenue. We generally recognize revenue using a cost-based input method.

Licenses of Intellectual Property

If a license to our intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, we recognize revenue allocated to the license when the license is transferred to our customer and our customer is able to use and benefit from the license. For licenses that are bundled with other promises, we utilize judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue associated with the bundled performance obligation. We evaluate the measure of progress each reporting period and, if necessary, adjust the measure of progress and related revenue recognition.

Milestone Payments

At the inception of each arrangement that includes developmental and regulatory milestone payments, we evaluate whether the achievement of each milestone specifically relates to our efforts to satisfy a performance obligation or transfer a distinct good or service within a performance obligation. If the achievement of a milestone is considered a direct result of our efforts to satisfy a performance obligation or transfer a distinct good or service and the receipt of the payment is based upon the achievement of the milestone, the associated milestone value is allocated to that distinct good or service, otherwise it will be allocated to all performance obligations of the arrangement based on the initial allocation.

We evaluate each milestone to determine when and how much of the milestone to include in the transaction price. We first estimate the amount of the milestone payment that we could receive using either the expected value or the most likely amount approach. We primarily use the most likely amount approach as that approach is generally most predictive for milestone payments with a binary outcome. Then, we consider whether any portion of that estimated amount is subject to the variable consideration constraint (that is, whether it is probable that a significant reversal of cumulative revenue would not occur upon resolution of the uncertainty). We update the estimate of variable consideration included in the transaction price at each reporting date which includes updating the assessment of the likely amount of consideration and the application of the constraint to reflect current facts and circumstances.

Royalties

For arrangements that include sales-based royalties, including milestone payments based on the level of sales, and the license is deemed to be the predominant item to which the royalties relate, we recognize revenue at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied). To date, we have not recognized any revenue related to sales-based royalties or milestone payments based on the level of sales.

Manufacturing Supply Services

For arrangements that include a promise of supply of clinical or commercial product, we determine if the supply is a promise in the contract or a future obligation at our customer's option. If determined to be a promise at inception of the contract, we evaluate the promise to determine whether it is a separate performance obligation or a component of a bundled performance obligation. If determined to be an option, we determine if the option provides a material right to our customer and if so, account for the option as a separate performance obligation. If determined to be an option but not a material right, we account for the option as a separate contract when our customer elects to exercise the option.

Application of the above guidance requires significant judgment and requires us to make determinations based on the facts and circumstances under each arrangement.

Accrued Research and Development Expenses

As part of the process of preparing our consolidated financial statements, we are required to estimate our accrued research and development expenses. This process involves reviewing open contracts and purchase orders, communicating with our personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated costs incurred for the services when we have not yet been invoiced or otherwise notified of the actual costs. The majority of our service providers invoice us in arrears for services performed, on a pre-determined schedule or when contractual milestones are met; however, some require advanced payments. We make estimates of our accrued expenses as of each balance sheet date in our financial statements based on facts and circumstances known to us at that time. Examples of estimated accrued research and development expenses include fees paid to:

- CROs in connection with performing research services on our behalf and clinical trials;
- investigative sites or other providers in connection with clinical trials;
- vendors in connection with preclinical and clinical development activities; and
- vendors related to product manufacturing, development and distribution of preclinical and clinical supplies.

We base our expenses related to preclinical studies and clinical trials on our estimates of the services received and efforts expended pursuant to quotes and contracts with multiple CROs that conduct and manage clinical trials on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the clinical expense. Payments under some of these contracts depend on factors such as the successful enrollment of patients and the completion of clinical trial milestones. In accruing service fees, we estimate the time period over which services will be performed, enrollment of patients, number of sites activated and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or amount of prepaid expense accordingly. Although we do not expect our estimates to be materially different from amounts actually incurred, our understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and may result in us reporting amounts that are too high or too low in any particular period. To date, we have not made any material adjustments to our prior estimates of accrued research and development expenses.

Results of Operations

Comparison of the Years Ended December 31, 2021 and 2020

The following table summarizes our results of operations for the years ended December 31, 2021 and 2020.

	Year Ended December 31,		
	2021	2020	Change
		(in thousands)	
Revenue:			
Collaboration revenue - related party	$ 143,857	$ 11,897	$ 131,960
Grant revenue	1,070	4,157	(3,087)
Collaboration revenue	—	17,161	(17,161)
Total revenue	144,927	33,215	111,712
Operating expenses:			
Research and development	141,891	90,570	51,321
General and administrative	69,261	30,775	38,486
Collaboration (profit) loss sharing - related party	(1,732)	—	(1,732)
Total operating expenses	209,420	121,345	88,075
Loss from operations	(64,493)	(88,130)	23,637
Other (expense) income:			
Interest income	2,870	946	1,924
Interest expense	(2,910)	(2,924)	14
Other (expense) income	(1,045)	981	(2,026)
Total other (expense) income, net	(1,085)	(997)	(88)
Net loss	$ (65,578)	$ (89,127)	$ 23,549

Revenue

Total revenue was $144.9 million and $33.2 million for the years ended December 31, 2021 and 2020, respectively. The increase in total revenue of $111.7 million is primarily driven by an increase in related party collaboration revenue due to the recognition of revenue for the license we granted to Nestlé under the 2021 License Agreement and related transfer of control of the license. The increase in related party collaboration revenue was partially offset by a decrease of $17.2 million in collaboration revenue associated with our Research Agreement with MedImmune, a wholly owned subsidiary of AstraZeneca Inc. The decrease in collaboration revenue in fiscal 2021 was due to AstraZeneca's election to terminate the Research Agreement in December 2020. As the Research Agreement was terminated in December 2020, no collaboration revenue was recognized in fiscal 2021.

Research and Development Expenses

	Year Ended December 31,		
	2021	2020	Change
		(in thousands)	
Microbiome therapeutics platform	$ 34,784	$ 25,748	$ 9,036
SER-109	40,510	14,939	25,571
SER-287	9,881	16,347	(6,466)
Early stage programs	4,953	5,323	(370)
Total direct research and development expenses	90,128	62,357	27,771
Personnel-related (including stock-based compensation)	51,763	28,213	23,550
Total research and development expenses	$ 141,891	$ 90,570	$ 51,321

Research and development expenses were $141.9 million for the year ended December 31, 2021, compared to $90.6 million for the year ended December 31, 2020. The increase of $51.3 million was due primarily to the following:

- an increase of $9.0 million in research expenses related to our microbiome therapeutics platform due primarily to an increase of $3.6 million in external consulting expenses and $5.6 million in facilities costs, lab supplies, and consumables;
- an increase of $25.6 million in expenses related to our SER-109 program, due primarily to an increase of $6.4 million in clinical trial expenses, an increase of $6.8 million in facilities costs, lab supplies, and consumables, an increase of $8.7 million in external consulting expenses and an increase of $3.1 million in contract manufacturing costs;
- a decrease of $6.5 million in expenses of our SER-287 program primarily driven by a decrease of $4.8 million in clinical trial expenses and $1.5 million in facilities costs, lab supplies, and consumables;
- a decrease of $0.4 million in expenses of our early stage programs primarily driven by a decrease in external consulting expenses, partially offset by an increase in clinical trial expenses.
- an increase in personnel-related costs of $23.6 million primarily due to an increase of $18.2 million in salaries, payroll taxes and employee benefit expenses and a $5.4 million increase in stock-based compensation expense as a result of increased headcount; and

We expect that our research and development expenses will increase in the foreseeable future as we advance the clinical development of SER-109, SER-301, and SER-155, re-evaluate the clinical development of SER-287 in light of clinical study results and in conjunction with the additional microbiome biomarker data, and continue to discover and develop additional product candidates and pursue later stages of clinical development of our product candidates.

General and Administrative Expenses

	Year Ended December 31,		
	2021	2020	Change
		(in thousands)	
Personnel-related (including stock-based compensation)	$ 23,933	$ 11,078	$ 12,855
Professional fees	33,754	13,781	19,973
Facility-related and other	11,574	5,916	5,658
Total general and administrative expenses	$ 69,261	$ 30,775	$ 38,486

General and administrative expenses were $69.3 million for the year ended December 31, 2021, compared to $30.8 million for the year ended December 31, 2020. The increase of $38.5 million was primarily due to the following:

- an increase in personnel-related costs of $12.9 million primarily due to an increase of $6.1 million in salaries, payroll taxes and employee benefit expenses, and a $6.0 million increase in stock-based compensation expense; and
- an increase in professional fees of $20.0 million primarily due to a $15.7 million increase in professional service and consulting fees and pre-launch commercial expenses and a $2.4 million increase in recruiting fees.
- an increase in facility-related and other costs of $5.7 million due primarily to increases in IT-related expenses of $3.7 million and lab and office supplies of $2.1 million.

Collaboration (Profit) Loss Sharing - related party

Collaboration (profit) loss sharing – related party was $1.7 million of income to us for the year ended December 31, 2021. There was no collaboration (profit) loss sharing for the year ended December 31, 2020. For the year ended December 31, 2021 we incurred $5.6 million of pre-launch expenses which we recorded within research and development expense or general and administrative expense based on the nature of the underlying expense. Our collaborative partner incurred $2.0 million of pre-launch expenses for the year ended December 31, 2021. Therefore, the $1.7 million of income recorded represents the sharing of 50% of the pre-launch expenses and represents income to us because we performed more of the pre-launch activities than our collaborative partner.

Other (Expense) Income, Net

Other (expense) income, net was $1.1 million of expense for the year ended December 31, 2021 and $1.0 million of income for the year ended December 31, 2020.

Liquidity and Capital Resources

Since our inception, we have generated revenue only from collaborations and have incurred recurring net losses. We anticipate that we will continue to incur losses for at least the next several years. Our research and development and general and administrative expenses may continue to increase and, as a result, we will need additional capital to fund our operations, which we may obtain from additional financings, public offerings, research funding, additional collaborations, contract and grant revenue or other sources.

In August 2020, we completed an underwritten public offering in which we sold 10,500,000 shares of our common stock at a public offering price of $21.50 per share. In addition, we granted the underwriters a 30-day option to purchase up to an additional 1,575,000 shares of its common stock at the public offering price, less underwriting discounts and commissions, which the underwriters exercised in full. We received aggregate net proceeds from the offering of approximately $243.7 million after deducting underwriting discounts and commissions and offering expenses payable by us.

In August 2020, we entered into a Securities Purchase Agreement with Nestlé for the sale of 959,002 shares of our common stock at a purchase price of $20.855 per share (the “concurrent placement”). We received aggregate net proceeds from the concurrent placement of approximately $19.9 million after deducting offering expenses payable by us.

In November 2019, we entered into a common stock sales agreement, or the 2019 Sales Agreement, with Cowen to sell shares of our common stock with aggregate gross sales proceeds of up to $25.0 million, from time to time, through an "at the market" equity offering program, or ATM, under which Cowen acts as sales agent. In March 2020, in connection with filing an updated registration statement on Form S-3 (File No. 333-237033), we entered into a new common stock sales agreement, or the 2020 Sales Agreement, with Cowen on substantially the same terms as the 2019 Sales Agreement and terminated the 2019 Sales Agreement. In May 2021, we entered into a new common stock sales agreement, or the 2021 Sales Agreement, with Cowen to sell shares of our common stock with aggregate gross sales proceeds of up to $150.0 million, from time to time, through an ATM under which Cowen acts as sales agent, and terminated the 2020 Sales Agreement. During the year ended December 31, 2020, we sold approximately 5.8 million shares of common stock under the 2019 Sales Agreement and the 2020 Sales Agreement, as applicable, at an average price of approximately $4.40 per share, raising aggregate net proceeds of approximately $24.8 million after deducting an aggregate commission of approximately 3%. During the year ended December 31, 2021, we did not sell any shares of common stock under the 2020 Sales Agreement or the 2021 Sales Agreement.

As of December 31, 2021, we had cash, cash equivalents and short- and long-term investments totaling $291.2 million and an accumulated deficit of $614.4 million. Based on our current plans and forecasted expenses, we believe that our cash, cash equivalents and investments as of December 31, 2021 and proceeds, net of facility fees and expenses, of $27.6 million received in February 2022 in connection with the Second Amendment, will enable us to fund our operating expenses, debt service obligations and capital expenditures for at least the next 12-months from issuance of our consolidated financial statements included elsewhere in this Annual Report on Form 10-K. We have based this estimate on assumptions that may prove to be wrong, and we could use our capital resources sooner than we currently expect.

Collaboration and Manufacturing Agreements

License Agreement with Société des Produits Nestlé S.A. (Nestlé)

In January 2016, we entered into the 2016 License Agreement with Société des Produits Nestlé S.A., or, together with NHSc Pharma Partners, Nestlé, for the development and commercialization of certain of our product candidates in development for the treatment and management of CDI and IBD, including UC and Crohn’s disease. In exchange for the license, Nestlé agreed to pay us an upfront cash payment of $120.0 million, which we received in February 2016. Nestlé has also agreed to pay us tiered royalties, at percentages ranging from the high single digits to high teens, of net sales of certain products based on our microbiome technology that are being developed for the treatment of CDI and IBD, including SER-109, SER-262, SER-287 and SER-301, or collectively, the 2016 Collaboration Products, in markets outside of the United States and Canada, or the 2016 Licensed Territory. We are eligible to receive up to $285.0 million in development milestone payments, $375.0 million in regulatory payments and up to an aggregate of $1.1 billion for the achievement of certain commercial milestones related to the sales of 2016 Collaboration Products. The full potential value of the up-front payment and milestone payments payable by Nestlé is over $1.9 billion, assuming all products receive regulatory approval and are successfully commercialized. In September 2016, we received a $10.0 million milestone payment associated with the initiation of the Phase 1b clinical study for SER-262 in CDI. In June 2017, we initiated a Phase 3 clinical study of SER-109 (ECOSPOR III) in patients with multiply recurrent CDI. In July 2017, we received $20.0 million based on the achievement of this milestone under the 2016 License Agreement. In November 2018, we executed a letter agreement with Nestlé, or the Letter Agreement, modifying certain terms of the 2016 License Agreement. Under the Letter Agreement, Nestlé agreed to pay us the $20.0 million Phase 3 milestone payment upon commencement of the Phase 2b study for SER-287. In December 2018, we received $40.0 million in milestone payments in connection with the commencement of the Phase 2b study for SER-287. In August 2020, we received $10.0 million from Nestlé in connection with the initiation of the Phase 1b SER-301 study. To date, we have received $80.0 million in development milestones under the 2016 License Agreement with Nestlé.

For the development of 2016 Collaboration Products for IBD under a global development plan, we agreed to pay the costs of clinical trials of such products up to and including Phase 2 clinical trials, and 67% of the costs for Phase 3 and other clinical trials of such products, with Nestlé bearing the remaining 33% of such costs. The Letter Agreement also provides scenarios under which Nestlé's reimbursement to us for certain Phase 3 development costs would be reduced or delayed depending on the outcomes of the SER-287 Phase 2b study. For other clinical development of 2016 Collaboration Products for IBD, we agreed to pay the costs of such activities to support approval in the United States and Canada, and Nestlé agreed to bear the cost of such activities to support approval of 2016 Collaboration Products in the 2016 Licensed Territory.

With respect to development of 2016 Collaboration Products for CDI under a global development plan, we agreed to pay all costs of Phase 2 clinical trials for SER-109 and for Phase 3 clinical trials for SER-109. We agreed to bear all costs of conducting any Phase 1 or Phase 2 clinical trials under a global development plan for 2016 Collaboration Products other than SER-109 for CDI. We agreed to pay 67% and Nestlé agreed to pay 33% of other costs of Phase 3 clinical trials conducted for 2016 Collaboration Products other than SER-109 for CDI under a global development plan. For other clinical development of 2016 Collaboration Products for CDI, we agreed to pay costs of such development activities to support approval in the United States and Canada, and Nestlé agreed to bear the cost of such activities to support approval of 2016 Collaboration Products in the 2016 Licensed Territory.

The 2016 License Agreement continues in effect until terminated by either party on the following bases: (i) Nestlé may terminate the 2016 License Agreement in the event of serious safety issues related to any of the 2016 Collaboration Products; (ii) we may terminate the 2016 License Agreement if Nestlé challenges the validity or enforceability of any of our licensed patents; and (iii) either party may terminate the 2016 License Agreement in the event of the other party's uncured material breach or insolvency. Upon termination of the 2016 License Agreement, all licenses granted to Nestlé by us will terminate, and all rights in and to the 2016 Collaboration Products in the 2016 Licensed Territory will revert to us. If we commit a material breach of the 2016 License Agreement, Nestlé may elect not to terminate the 2016 License Agreement but instead apply specified adjustments to its payment obligations and other terms and conditions of the 2016 License Agreement.

License Agreement with NHSc Pharma Partners (Nestlé)

On July 1, 2021, we entered into a License Agreement, or the 2021 License Agreement, with NHSc Pharma Partners, or, together with Société des Produits Nestlé S.A., Nestlé. Pursuant to the 2021 License Agreement, we granted to Nestlé, under certain of our patent rights and know how, a co-exclusive, sublicensable (under certain circumstances) license to develop, commercialize and conduct medical affairs activities for (i) therapeutic products based on our microbiome technology (including our SER-109 product candidate) that are developed by us or on our behalf for the treatment of CDI and recurrent CDI, as well as any other indications pursued for the products upon mutual agreement of the parties, or the 2021 Field, in the United States and Canada, or the 2021 Licensed Territory, and (ii) our SER-109 product candidate and any improvements and modifications thereto developed pursuant to the terms of the 2021 License Agreement, or the 2021 Collaboration Products, for any indications in the 2021 Licensed Territory.

The 2021 License Agreement sets forth the parties' respective obligations for development, regulatory, commercialization, medical affairs, and manufacturing and supply activities for the 2021 Collaboration Products with respect to the 2021 Field and the 2021 Licensed Territory. Pursuant to the 2021 License Agreement, we are responsible for, and will use commercially reasonable efforts in, conducting development of SER-109 in the 2021 Field in the United States until first regulatory approval for SER-109 is obtained in the 2021 Field in the United States and in accordance with a development and regulatory activity plan, at our cost, subject to certain exceptions specified in the 2021 License Agreement. We are also responsible for all regulatory affairs related to 2021 Collaboration Products in the 2021 Field in the 2021 Licensed Territory, at its cost, except that expenses incurred for regulatory activities approved by a joint steering committee pursuant to a life cycle management plan for 2021 Collaboration Products are shared equally between the parties. We will be solely responsible for manufacturing and supplying 2021 Collaboration Products for development in the 2021 Field in the 2021 Licensed Territory.

Nestlé has the sole right to commercialize the 2021 Collaboration Products in the 2021 Licensed Territory in accordance with a commercialization plan, subject to our right to elect to provide up to a specified percentage of all promotional details for a certain target audience. Each party will use commercially reasonable efforts to commercialize the 2021 Collaboration Products in the 2021 Licensed Territory in accordance with the commercialization plan. Both parties will perform medical affairs activities for 2021 Collaboration Products in the 2021 Licensed Territory in accordance with a medical affairs plan. We will be solely responsible for the manufacturing and supply of 2021 Collaboration Products for commercialization under a supply agreement that will be entered into between the parties. We will be responsible for commercialization and medical affairs activities costs incurred by the parties until first commercial sale of the first 2021 Collaboration Product in the 2021 Licensed Territory and in accordance with a pre-launch plan, up to a specified cap. Following first commercial sale of the first 2021 Collaboration Product, we will be entitled to a royalty in an amount equal to approximately 50% of the commercial profits.

In exchange for the grant of the licenses under the 2021 License Agreement, Nestlé agreed to pay us a non-refundable, non-creditable and non-cancellable upfront payment of $175.0 million, which was received in July 2021. Nestlé also agreed to pay us an additional $125.0 million due upon FDA approval of SER-109, $10.0 million upon Canadian regulatory approval of SER-109, and sales target milestones payments totaling up to $225.0 million.

The 2021 License Agreement continues in effect until all development and commercialization activities for all 2021 Collaboration Products in the 2021 Licensed Territory have permanently ceased. The 2021 License Agreement may be terminated by either party upon sixty days' written notice for the other party's material breach that remains uncured during such sixty-day period, or immediately upon written notice for the other party's insolvency. Nestlé may also terminate the 2021 License Agreement at-will (i) with twelve months' prior written notice, effective only on or after the third anniversary of first commercial sale of the first 2021 Collaboration Product in the 2021 Licensed Territory, (ii) if first commercial sale of the first 2021 Collaboration Product in the 2021 Licensed Territory has not occurred by the fifth anniversary of the effective date of the 2021 License Agreement, with one hundred eighty days' prior written notice, which must be provided during a specified period set forth in the 2021 License Agreement, or (iii) if regulatory approval for SER-109 is not granted after submission by us of a filing seeking first regulatory approval as set forth in the development and regulatory activity plan, and the parties fail to agree on further development of SER-109 in accordance with the terms of the 2021 License Agreement, with one hundred eighty days' prior written notice, which must be provided within a specified period set forth in the 2021 License Agreement. We may also terminate the 2021 License Agreement immediately upon written notice if Nestlé challenges any licensed patent in the 2021 Licensed Territory.

Upon termination of the 2021 License Agreement, all licenses granted to Nestlé by us will terminate. If we commit a material breach of the 2021 License Agreement, Nestlé may elect not to terminate the 2021 License Agreement but instead apply specified adjustments to the payment terms and other terms and conditions of the 2021 License Agreement. The 2021 License Agreement contains customary representations and warranties by the parties, intellectual property provisions including ownership, patent prosecution, enforcement and defense, certain indemnification rights in favor of each party, and customary confidentiality provisions and limitations of liability.

Bacthera Long Term Manufacturing Agreement

In November 2021, we entered into a Long Term Manufacturing Agreement, or the Bacthera Agreement with BacThera AG, or Bacthera, a joint venture between Chr. Hansen and a Lonza Group affiliate. The Bacthera Agreement governs the general terms under which Bacthera, or one of its affiliates, will (i) construct a dedicated full-scale production suite for us at Bacthera's Microbiome Center of Excellence in Visp, Switzerland, which is currently under construction; and (ii) provide manufacturing services to us for our SER-109 product and, if agreed by the parties, SER-287 product.

Under the terms of the Bacthera Agreement, we agreed to pay Bacthera a total of at least 240 million CHF (or approximately $262 million) for the initial term of the agreement, inclusive of the construction fees and annual operating fees. The construction fees are payable upon the achievement of certain milestones related to the construction of the dedicated manufacturing suite. The annual operating fee includes the cost of a baseline annual batch production volume. We have also agreed to pay certain other ancillary fees and a per-batch fee in excess of the baseline batches. These fees are subject to adjustment during construction for certain items outside of Bacthera's control and annually against an agreed index. We will supply the active pharmaceutical ingredients to Bacthera to enable it to perform the services and pay for certain other raw materials and manufacturing components, which will be acquired by Bacthera.

The Bacthera Agreement has an initial term that continues until the tenth anniversary of the earlier of (a) successful completion of construction and demonstration of Bacthera's readiness for commercial production or (b) the commencement of manufacturing. The initial term is subject to renewals, which could extend the term to 16 years, and additional three-year terms thereafter. Each party has the ability to terminate the Bacthera Agreement upon the occurrence of certain customary conditions. We may also terminate the Bacthera Agreement for convenience after a defined period. In the event of a termination, we have certain financial obligations that would apply, and Bacthera has agreed to grant a license to Bacthera-developed manufacturing know how, if any, and provide technical assistance to us, so that we could transfer the manufacturing operations to ourselves or a third party. The Bacthera Agreement also contains representations, warranties and indemnity obligations as well as limitations of liability that are customary for agreements of this type.

Agreement with AstraZeneca

In March 2019, we entered into the Research Agreement with MedImmune, a wholly owned subsidiary of AstraZeneca. Pursuant to the Research Agreement, we and AstraZeneca agreed to conduct certain pre-clinical and development activities and may conduct certain clinical research with the goal of advancing the mechanistic understanding of the microbiome in augmenting the efficacy of cancer immunotherapy, including potential synergy with AstraZeneca compounds in accordance with a mutually agreed research plan. Pursuant to the Research Agreement, we agreed not to conduct research or development of any microbiome products specifically designed by us during the term of the Research Agreement for the treatment of cancer with or on behalf of any third party without the prior approval of the joint steering committee for the Research Agreement until at least three years after the effective date of the Research Agreement.

AstraZeneca agreed to bear all costs of conducting its activities under the research plan and to reimburse us for certain costs incurred under the research plan. Additionally, AstraZeneca agreed to pay to us a total of $20.0 million in three equal installments, the first of which we received in April 2019, the second of which we received in December 2019, and the third of which we received in January 2021. Such payments are payable even if the Research Agreement is terminated in accordance with its terms, unless the Research Agreement is terminated by AstraZeneca for our uncured material breach.

We also granted AstraZeneca an exclusive option to negotiate exclusive license rights to certain of our technologies and assets. If AstraZeneca exercises this option, we have agreed to enter into good faith negotiations with them for terms and conditions of such license agreement for a specified time period.

In December 2020, we received written notice from AstraZeneca that they elected to terminate the Research Agreement by and in accordance with its terms. The termination of the Research Agreement was effective on April 2, 2021.

Indebtedness

Loan and Security Agreement with Hercules

In October 2019, we entered into a loan and security agreement with Hercules, pursuant to which a term loan in an aggregate principal amount of up to $50.0 million, or the Original Credit Facility, was available to us in three tranches, subject to certain terms and conditions. We received the first tranche of $25.0 million upon signing the agreement on October 29, 2019. We did not meet the milestone requirements for the second tranche under the Original Credit Facility, and as such, the additional second tranche amount of up to $12.5 million is not available for us to borrow. We elected not to borrow the third tranche of $12.5 million, which was available upon Hercules' approval until June 30, 2021. Commitments of Hercules to lend to us under the Original Credit Facility are subject to amendments made pursuant to the Second Amendment, as defined below. See "Amendment to Loan and Security Agreement with Hercules" below.

Advances under the Original Credit Facility bore interest at a rate equal to the greater of either (i) the Prime Rate (as reported in The Wall Street Journal) plus 4.40%, and (ii) 9.65%. Following an interest-only period of 24 months, principal payments were due in 24 equal monthly installments commencing December 1, 2021 and ending November 1, 2023. We paid Hercules a commitment fee of $0.4 million at the closing. The interest rate, interest-only period and prepayments under the Original Credit Facility are subject to amendments made pursuant to the Second Amendment. See "Amendment to Loan and Security Agreement with Hercules" below.

The Original Credit Facility is secured by substantially all of our assets, other than our intellectual property. We have agreed to not pledge or secure our intellectual property to others.

The Original Credit Facility includes affirmative and negative covenants applicable to us. The affirmative covenants include, among others, covenants requiring us to maintain our legal existence and governmental approvals, deliver certain financial reports and maintain insurance coverage. The negative covenants include, among others, restrictions on our transferring collateral, making changes to the nature of our business, incurring additional indebtedness, engaging in mergers or acquisitions, paying dividends or making other distributions, making investments, engaging in transactions with affiliates, creating liens and selling assets, in each case subject to certain exceptions, including, among others, the ability for us to issue up to $150.0 million in convertible notes and entering into exclusive outbound licenses for our intellectual property. Certain covenants under the Original Credit Facility were amended by the Second Amendment. See "Amendment to Loan and Security Agreement with Hercules" below.

The Original Credit Facility also includes events of default, the occurrence and continuance of which provide Hercules with the right to demand immediate repayment of all principal and unpaid interest, and to exercise remedies against us and the collateral. These events of default include, among other things and subject to customary exceptions: (i) insolvency, liquidation, bankruptcy or similar events; (ii) failure to pay any debts due under the loan and security agreement with Hercules or other loan documents on a timely basis; (iii) failure to observe certain covenants under the loan and security agreement with Hercules; (v) occurrence of a material adverse effect; (vi) material misrepresentation by us; (vii) occurrence of any default under any other agreement involving material indebtedness; and (viii) certain material money judgments.

On April 16, 2020, we entered into an amendment to the loan and security agreement with Hercules (the "First Amendment"), permitting us to enter into a promissory note under the Paycheck Protection Program of the Coronavirus Aid, Relief and Economic Stability Act. On April 17, 2020 we issued a Promissory Note to Bank of America, NA, pursuant to which we received loan proceeds of $2.9 million (the "Loan"), however, based on updated guidance related to this program, we decided to repay the full amount of the Loan, and repaid the Loan on May 4, 2020.

As of December 31, 2021 and December 31, 2020, the outstanding principal under the Original Credit Facility was $24.1 million and $25.0 million, respectively. For a further description of the Original Credit Facility, see Note 9 to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Amendment to Loan and Security Agreement with Hercules

Effective as of February 24, 2022 (the "Effective Date"), we entered into a Second Amendment to the Original Credit Facility (as amended by the First Amendment) pursuant to which term loans in an aggregate principal amount of up to $100.0 million (the "New Credit Facility") have become available to us in five tranches including the first tranche under the Original Credit Facility, subject to certain terms and conditions.

The first tranche in an aggregate principal amount of $25.0 million is outstanding as of the Effective Date, after taking into account reborrowing by us on the Effective Date of a previously-repaid principal amount of approximately $2.9 million. The second tranche in an aggregate principal amount of $12.5 million and the third tranche in an aggregate principal amount of $12.5 million have

been advanced to us and are outstanding as of the Effective Date. The fourth tranche in an aggregate principal amount of $25.0 million is available upon satisfaction of certain conditions, including the approval by the U.S. Food and Drug Administration of a biologics license application in respect of SER-109 (the "Regulatory Approval Milestone") by no later than December 15, 2023. The fifth tranche in an aggregate principal amount of up to $25.0 million is available through the Amortization Date (as defined below) upon satisfaction of certain conditions, including the Lenders' investment committee approval.

All advances outstanding under the New Credit Facility will bear interest at a rate equal to the greater of either (i) the Prime Rate (as reported in The Wall Street Journal) plus 6.40%, and (ii) 9.65%. For all advances outstanding under the New Credit Facility, we will make interest only payments through December 31, 2023, extendable to December 31, 2024 upon satisfaction of certain conditions (such applicable date, the "Amortization Date"). The principal balance and interest of the advances will be repaid in equal monthly installments after the Amortization Date and continuing through October 1, 2024, extendable to October 1, 2025, upon satisfaction of certain conditions (such applicable date, the "Maturity Date").

We may prepay advances under the New Credit Facility, in whole or in part, at any time subject to a prepayment charge equal to: (a) 2.0% of amounts so prepaid, if such prepayment occurs during the first year following the Effective Date; (b) 1.5% of the amount so prepaid, if such prepayment occurs during the second year following the Effective Date, and (c) 1.0% of the amount so prepaid, if such prepayment occurs during the third year following the Effective Date.

We will pay an end of term charge of 4.85% of the aggregate amount of the advances made under the Old Credit Facility on the earliest date of (i) November 1, 2023; (ii) the date that we prepay all of the outstanding principal in full, or (iii) the date the loan payments are accelerated due to an event of default. We will pay an additional end of term charge of 1.75% of the aggregate amount of the advances under the New Credit Facility (including the first tranche of $25.0 million) on the earliest date of (i) the Maturity Date; (ii) the date that we prepay all of the outstanding principal in full, or (iii) the date the loan payments are accelerated due to an event of default.

Other terms of the New Credit Facility remain generally identical to those under the Old Credit Facility, with certain covenants amended by the Second Amendment to provide us with additional operational flexibility, including the ability for us to issue up to $350.0 million in convertible notes. The New Credit Facility includes a conditional liquidity covenant commencing on June 15, 2023, which ceases to apply if certain conditions including the Regulatory Approval Milestone are satisfied.

Cash Flows

The following table summarizes our sources and uses of cash, cash equivalents and restricted cash for the years ended December 31, 2021 and 2020.

	Year Ended December 31,	
	2021	2020
	(in thousands)	
Cash provided by (used in) operating activities	$ 6,688	$ (93,610)
Cash provided by (used in) investing activities	$ 64,088	$ (158,891)
Cash provided by financing activities	$ 1,178	$ 303,424
Net increase in cash, cash equivalents and restricted cash	$ 71,954	$ 50,923

Operating Activities

During the year ended December 31, 2021, net cash provided by operating activities was $6.7 million, primarily due to changes in our operating assets and liabilities of $41.5 million and non-cash charges of $30.7 million, partially offset by a net loss of $65.6 million. Non-cash charges consisted primarily of $20.2 million of stock-based compensation expense, $3.3 million related to the amortization of right-of-use assets, $5.9 million of depreciation, and $2.5 million of net amortization of premiums related to our investments, partially offset by collaboration profit sharing of $1.7 million related to the license and collaboration agreement with Nestlé. Changes in our operating assets and liabilities during the year ended December 31, 2021 primarily consisted of a $43.0 million increase in accrued expenses and other liabilities, a $9.4 million increase in accounts payable and a $9.4 million decrease in accounts receivable, partially offset by a $12.3 million increase in prepaid expenses and other current and non-current assets, a $4.4 million decrease in deferred revenue and a $3.6 million decrease in operating lease liabilities. The increase in accrued expenses and other current and long-term liabilities was primarily due to the liability established for pre-launch activities in conjunction with the 2021 License Agreement with Nestlé. The decrease in deferred revenue is due to recognition of revenue during the year, partially offset by an increase of $8.2 million, which represents the portion of the transaction price for the 2021 License Agreement allocated to the research and development services. The decrease in operating lease liabilities was due to the cash payment of lease obligations.

During the year ended December 31, 2020, operating activities used $93.6 million of cash, primarily due to a net loss of $89.1 million and by cash used in changes in our operating assets and liabilities of $23.2 million and partially offset by non-cash charges of $18.7 million. Net cash used in changes in our operating assets and liabilities during the year ended December 31, 2020 primarily consisted of a $11.6 million decrease in deferred revenue, a $4.5 million decrease in operating lease liabilities, a $1.2 million decrease in accounts payable, a $7.6 million increase in accounts receivable, a $2.2 million increase in prepaid expenses and other current

assets, and offset by a $3.8 million decrease in accrued expenses and other liabilities. The decrease in deferred revenue is due to recognition of revenue during the year and partially offset by $10.0 million associated with the increase in the transaction price for the 2016 License Agreement for the initiation of the Phase 1b study for SER-301. The decrease in operating lease liabilities was due to the cash payment of lease obligations.

Investing Activities

During the year ended December 31, 2021, net cash provided by investing activities was $64.1 million, primarily due to maturities of investments of $169.6 million, partially offset by purchases of investments of $96.0 million and purchases of property and equipment of $9.6 million.

During the year ended December 31, 2020, investing activities used $158.9 million of cash, consisting of purchases of investments of $218.3 million, and purchases of property and equipment of $0.6 million; these amounts were partially offset by sales and maturities of investments of $60.0 million.

Financing Activities

During the year ended December 31, 2021, net cash provided by financing activities was $1.2 million. This was a result of $1.3 million from the exercise of stock options and $0.8 million from the issuance of common stock under the ESPP plan, partially offset by $0.9 million of principal payments relating to our term loan.

During the year ended December 31, 2020, net cash provided by financing activities was $303.4 million. This was a result of $243.7 million from proceeds from public offering of common stock, net of costs, $19.9 million of proceeds from the Securities Purchase Agreement, $24.8 million of proceeds from the at market equity offering, net of commissions, and $14.4 million from the exercise of stock options.

Funding Requirements

Our expenses may increase substantially in connection with our ongoing and planned activities related to our pipeline products, which are in clinical development, and our follow-on therapeutic candidates and other programs. In addition, we expect to continue to incur additional costs associated with operating as a public company. We anticipate that our expenses will increase substantially if and as we:

- complete the clinical development and prepare for commercialization of SER-109 for patients with recurrent CDI;
- re-evaluate the clinical development of SER-287 for the treatment of UC in light of the Phase 2b clinical study results and in conjunction with the additional microbiome biomarker data;
- continue the clinical development of SER-301 for the treatment of UC;
- conduct research and initiate clinical development of SER-155 for the prevention of mortality due to GvHD in patients receiving allo-HSCT;
- make strategic investments in manufacturing capabilities;
- make strategic investments in our research discovery and development platforms and capabilities;
- maintain and augment our intellectual property portfolio and opportunistically acquire complementary intellectual property;
- potentially establish a sales and distribution infrastructure and scale-up manufacturing capabilities to commercialize any products for which we may obtain regulatory approval;
- perform our obligations under our agreements with our collaborators;
- seek to obtain regulatory approvals for our product candidates; and
- experience any delays or encounter any issues with any of the above, including but not limited to failed studies, complex results, safety issues or other regulatory challenges.

Because of the numerous risks and uncertainties associated with the development of our programs, we are unable to estimate the amounts of increased capital outlays and operating expenses associated with completing the research and development of our product candidates. Our future capital requirements will depend on many factors, including:

- the impact of the COVID-19 pandemic;
- the progress and results of our clinical studies and pre-clinical development;
- the cost of manufacturing clinical supplies of our product candidates;
- the costs, timing and outcome of regulatory review of our product candidates and research activities;

- the costs and timing of future commercialization activities, including manufacturing, marketing, sales and distribution, for any of our product candidates for which we receive marketing approval;
- the revenue, if any, received from commercial sales of our product candidates for which we receive marketing approval;
- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims;
- the effect of competing technological and market developments; and
- the extent to which we acquire or invest in businesses, products and technologies, including entering into licensing or collaboration arrangements for product candidates.

Identifying potential product candidates and conducting preclinical testing and clinical trials is a time-consuming, expensive and uncertain process that takes years to complete, and we may never generate the necessary data or results required to obtain marketing approval and achieve product sales. In addition, our product candidates, if approved, may not achieve commercial success. Our commercial revenues, if any, will be derived from sales of products that we do not expect to be commercially available for many years, if ever. Accordingly, we will need to obtain substantial additional funds to achieve our business objectives.

Adequate additional funds may not be available to us on acceptable terms, or at all. Additionally, market volatility resulting from the COVID-19 pandemic or other factors could also adversely impact our ability to access capital as and when needed. To the extent that we raise additional capital through the sale of equity or convertible debt securities, our shareholders' ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect our shareholders' rights as common stockholders. Our loan and security agreement with Hercules currently includes, and any additional 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. Additional debt or preferred equity financing may also require the issuance of warrants, which could potentially dilute our shareholders' ownership interest.

If we raise additional funds through collaborations, strategic alliances or licensing arrangements with third parties, in addition to our existing collaboration agreements, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs, or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development programs or any future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

As noted above, the magnitude and duration of the COVID-19 pandemic and its impact on our liquidity and future funding requirements is uncertain as of the filing date of this Annual Report on Form 10-K as this continues to evolve globally. See "Impact of the COVID-19 Pandemic" above and "Risk Factors—Risks Related to Our Operations—The COVID-19 pandemic has adversely impacted and could continue to adversely impact, our business, including our preclinical studies and clinical trials, results of operations and financial condition" in Part I, Item 1A of this Annual Report on Form 10-K for a further discussion of the possible impact of the COVID-19 pandemic on our business.

As discussed in Note 1 of the consolidated financial statements included elsewhere in this Annual Report on Form 10-K we have the responsibility to evaluate whether conditions or events raise substantial doubt about our ability to meet our future financial obligations as they become due within one year after the date the financial statements are issued. We expect our cash, cash equivalents and short- and long-term investments at December 31, 2021 of $291.2 million, and proceeds, net of facility fees and expenses, of $27.6 million received in February 2022 in connection with the Second Amendment, will be sufficient to fund our operating expenses, debt service obligations and capital expenditure requirements for at least the next 12-months from issuance of the financial statements.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations at December 31, 2021 and the effect such obligations are expected to have on our liquidity and cash flows in future periods:

	Payments Due by Period				
	Total	Less Than 1 Year	2 - 3 Years	4 - 5 Years	More Than 5 Years
			(in thousands)		
Operating lease commitments[1]	$ 31,741	$ 8,512	$ 9,872	$ 4,965	$ 8,392
Long-term debt obligation, including interest and end of term charge[2]	27,689	—	27,689	—	—
Long-term manufacturing agreement[3]	255,727	7,648	87,260	40,205	120,614
Total	$ 315,157	$ 16,160	$ 124,821	$ 45,170	$ 129,006

(1) Amounts in the table reflect payments due under our operating lease agreements that expire between May 2021 and December 2031.

(2) Amounts in the table reflect payments due for our term loan under an arrangement with Hercules for $25,000. The amounts in the table above reflect interest-only payments through December 1, 2021 with payments on principal beginning thereafter. For purposes of the table above, interest payments were calculated using an annual interest rate of 9.65%, which was the interest rate in effect as of December 31, 2021. Additionally, the table above includes a payment due upon maturity of the loan of $1,213. See Note 9 and Note 18 of the consolidated financial statements for further discussion of the Hercules term loan.

(3) Amounts in the table reflect fixed amounts due under our long-term manufacturing agreement with Bacthera, inclusive of construction fees and annual operating fees.

We enter into contracts in the normal course of business with CROs for clinical trials, preclinical research studies and testing, manufacturing and other services and products for operating purposes. These contracts generally provide for termination upon notice, and therefore we believe that our non-cancelable obligations under these agreements are not material.

Recently Issued and Adopted Accounting Pronouncements

For a discussion of recent accounting standards see Note 2, Summary of Significant Accounting Policies, to our consolidated financial statements included in this report.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

Interest Rate Fluctuation Risk

We are exposed to market risk related to changes in interest rates.

As of December 31, 2021, our cash and cash equivalents consisted of cash and money market accounts. Our interest income is sensitive to changes in the general level of U.S. interest rates. However, because of the short-term nature of the instruments in our portfolio, an immediate 10% change in market interest rates would not have a material impact on the fair market value of our investment portfolio or on our financial position or results of operations.

As of December 31, 2021, we had outstanding borrowings under the Original Credit Facility. We accrue interest at a rate equal to the greater of either (i) the Prime Rate (as reported in The Wall Street Journal) plus 4.40%, and (ii) 9.65%. An immediate 10% change in the Prime Rate would not have a material impact on our debt-related obligations, financial position or results of operations

Item 8. Financial Statements and Supplementary Data

The financial statements required to be filed pursuant to this Item 8 are appended to this report. An index of those financial statements is found in Item 15.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Limitations on Effectiveness of Controls and Procedures

In designing and evaluating our disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives. In addition, the design of disclosure controls and procedures must reflect the fact that there are resource constraints and that management is required to apply judgment in evaluating the benefits of possible controls and procedures relative to their costs.

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our principal executive officer and principal financial officer, has evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended), as of the end of the period covered by this Annual Report on Form 10-K. Based on such evaluation, our principal executive officer and principal financial officer has concluded that as of December 31, 2021, our disclosure controls and procedures were effective at the reasonable assurance level.

Management's Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over our financial reporting, as such term is defined in Rule 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934, as amended.

Our management conducted an assessment of the effectiveness of our internal control over financial reporting based on the criteria set forth in "Internal Control – Integrated Framework (2013)" issued by the Committee of Sponsoring Organizations of the Treadway Commission.

Based on this assessment, our management concluded that, as of December 31, 2021, our internal control over financial reporting was effective.

The effectiveness of our internal control over financial reporting as of December 31, 2021, has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report included in this Annual Report on Form 10-K on page F-1.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting during our most recent fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

Effective as of February 24, 2022 (the "Effective Date"), we entered into a Second Amendment to Loan and Security Agreement (the "Second Amendment"), with the lenders party thereto (the "Lenders"), and Hercules Capital, Inc., in its capacity as the administrative agent and the collateral agent for the Lenders, which amended a loan and security agreement dated October 29, 2019 (as amended from time to time prior to the Effective Date, the "Original Credit Facility"). Under the Original Credit Facility, term loans in an aggregate principal amount of up to $50.0 million were available to us, of which $25.0 million (the "first tranche") has been advanced to us and approximately $22.1 million were outstanding immediately prior to the Effective Date. Pursuant to the Second Amendment, term loans in an aggregate principal amount of up to $100.0 million (the "New Credit Facility") have become available to us in five tranches including the first tranche, subject to certain terms and conditions.

The first tranche in an aggregate principal amount of $25.0 million is outstanding as of the Effective Date, after taking into account reborrowing by us on the Effective Date of a previously-repaid principal amount of approximately $2.9 million. The second tranche in an aggregate principal amount of $12.5 million and the third tranche in an aggregate principal amount of $12.5 million have been advanced to us and are outstanding as of the Effective Date. The fourth tranche in an aggregate principal amount of $25.0 million is available upon satisfaction of certain conditions, including the approval by the U.S. Food and Drug Administration of a biologics license application in respect of SER-109 (the "Regulatory Approval Milestone") by no later than December 15, 2023. The fifth tranche in an aggregate principal amount of up to $25.0 million is available through the Amortization Date (as defined below) upon satisfaction of certain conditions, including the Lenders' investment committee approval.

All advances outstanding under the New Credit Facility will bear interest at a rate equal to the greater of either (i) the Prime Rate (as reported in The Wall Street Journal) plus 6.40%, and (ii) 9.65%. For all advances outstanding under the New Credit Facility, we will make interest only payments through December 31, 2023, extendable to December 31, 2024 upon satisfaction of certain conditions (such applicable date, the "Amortization Date"). The principal balance and interest of the advances will be repaid in equal monthly installments after the Amortization Date and continuing through October 1, 2024, extendable to October 1, 2025, upon satisfaction of certain conditions (such applicable date, the "Maturity Date").

We may prepay advances under the New Credit Facility, in whole or in part, at any time subject to a prepayment charge equal to: (a) 2.0% of amounts so prepaid, if such prepayment occurs during the first year following the Effective Date; (b) 1.5% of the amount so prepaid, if such prepayment occurs during the second year following the Effective Date, and (c) 1.0% of the amount so prepaid, if such prepayment occurs during the third year following the Effective Date.

We will pay an end of term charge of 4.85% of the aggregate amount of the advances made under the Old Credit Facility on the earliest date of (i) November 1, 2023; (ii) the date that we prepay all of the outstanding principal in full, or (iii) the date the loan payments are accelerated due to an event of default. We will pay an additional end of term charge of 1.75% of the aggregate amount of the advances under the New Credit Facility (including the first tranche of $25.0 million) on the earliest date of (i) the Maturity Date; (ii) the date that we prepay all of the outstanding principal in full, or (iii) the date the loan payments are accelerated due to an event of default.

Other terms of the New Credit Facility remain generally identical to those under the Old Credit Facility, with certain covenants amended by the Second Amendment to provide us with additional operational flexibility, including the ability for us to issue up to $350.0 million in convertible notes. The New Credit Facility includes a conditional liquidity covenant commencing on June 15, 2023, which ceases to apply if certain conditions including the Regulatory Approval Milestone are satisfied.

The foregoing description of the Second Amendment does not purport to be complete and is qualified in its entirety by reference to the full text of the Second Amendment, a copy of which is filed as Exhibit 10.19 to this Annual Report on Form 10-K and is incorporated herein by reference.

Item 9C. Disclosure Regarding Jurisdictions That Prevent Inspections

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

Director Biographical Information

Name	Age	Position
Dennis A. Ausiello, M.D. (3)	76	Director
Grégory Behar (3)	52	Director
Stephen Berenson (3)	61	Chairman of the Board of Directors
Paul R. Biondi (2)	52	Director
Willard H. Dere, M.D. (1)	68	Director
Kurt C. Graves (2)	54	Director
Richard N. Kender (1)(2)	66	Director
Eric D. Shaff	46	President, Chief Executive Officer and Director
Meryl S. Zausner (1)(2)	65	Director

(1) Member of the audit committee.

(2) Member of the compensation and talent committee.

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

Dennis A. Ausiello, M.D. has served as a member of our board of directors since April 2015. Dr. Ausiello has served as the Jackson Distinguished Professor of Clinical Medicine at Harvard Medical School and Director, Emeritus of Harvard Medical School's M.D./Ph.D. Program since 1996, Chair of Medicine, Emeritus, and Director of the Center for Assessment Technology and Continuous Health (CATCH) at Massachusetts General Hospital, which he co-founded, since 2012, and Physician-in-Chief Emeritus at Massachusetts General Hospital since 2013. From 1996 to April 2013, Dr. Ausiello served as the Chief of Medicine at Massachusetts General Hospital. Dr. Ausiello is a member of the Institute of Medicine of the National Academy of Sciences and a fellow of the American Academy of Arts and Sciences. Dr. Ausiello has served on the board of directors of Alnylam Pharmaceuticals since April 2012 and previously served on the board of directors of Pfizer Inc. from 2006 to 2020, where he currently serves on the advisory board since 2019. Dr. Ausiello also serves on the boards of directors of numerous privately held companies. Dr. Ausiello received a B.A. in Biochemistry from Harvard College and an M.D. from the University of Pennsylvania. We believe that Dr. Ausiello is qualified to serve on our board of directors because of his extensive experience as a physician and as a director of pharmaceutical companies.

Grégory Behar has served as a member of our board of directors since December 2014. Mr. Behar has served as Chief Executive Officer of Nestlé Health Science, a business unit of Société des Produits Nestlé S.A., a health sciences company, since July 2014. From August 2011 to May 2014, Mr. Behar was President and Chief Executive Officer of Boehringer Ingelheim Pharmaceuticals Inc. (USA), a pharmaceutical company. From 2010 to July 2011, Mr. Behar was Corporate Vice President Region NECAR (North European Union, Canada and Australasia) for Boehringer-Ingelheim GmbH, a pharmaceutical company. Mr. Behar has served on the boards of directors of Nestlé Health Science since July 2014, Axcella Health, Inc. since February 2016 and Sonova AG since April 2021 and previously served on the board of directors of Aimmune Therapeutics, Inc. from November 2016 until its acquisition in October 2020. Mr. Behar received his B.S. in Mechanical Engineering from the University of California, Los Angeles, an M.S. in Mechanical Engineering and Manufacturing from EPFL in Switzerland and an M.B.A. from INSEAD in France. We believe that Mr. Behar is qualified to serve on our board of directors because of his extensive business experience in the health sciences and pharmaceutical industries.

Stephen Berenson has served as Chairman of our board of directors since December 2019 and as a member of our board of directors since August 2019. Mr. Berenson has been a Managing Partner at Flagship Pioneering, a life sciences innovation firm which conceives, creates, resources and develops first-in-category life sciences companies, since June 2017. Prior to Flagship, Mr. Berenson spent 33 years in various roles as an investment banker at J.P. Morgan, most recently serving in the role of Vice Chairman of Investment Banking from 2005 to April 2017, where he focused on providing high-touch strategic advice and complex transaction execution to leading companies across all industries globally. He was co-founder of J.P. Morgan's Global Strategic Advisory Council and co-founder of the firm's Board Initiative. Mr. Berenson has served as chairman of the board of directors of Cellarity since July 2021, and has served on the boards of directors of Moderna, Inc. since October 2017 and Repertoire Immune Medicines, a privately held company, since May 2021. Mr. Berenson received an S.B. in Mathematics from the Massachusetts Institute of Technology. We believe that Mr. Berenson is qualified to serve on our board of directors because of his extensive experience working with rapidly-growing companies across various industries.

Paul R. Biondi has served as a member of our board of directors since March 2020. Mr. Biondi is an Executive Partner and President of Pioneering Medicines at Flagship Pioneering, roles he has held since November 2019. Mr. Biondi joined Flagship Pioneering following a seventeen-year tenure at Bristol-Myers Squibb, or BMS, a pharmaceutical company, where he was most recently the

Senior Vice President of Strategy and Business Development from October 2015 to November 2019. Prior to serving in the role of Senior Vice President of Strategy, from 2002 to 2015, Mr. Biondi held a series of other leadership roles within BMS' Research and Development organization overseeing strategy, portfolio and project management, as well as clinical and business operations. Mr. Biondi holds a bachelor's degree from Dartmouth College and an M.B.A. from the J.L. Kellogg School of Management at Northwestern University. We believe that Mr. Biondi is qualified to serve on our board of directors because of his extensive experience in biopharmaceutical strategy and corporate development.

Willard H. Dere, M.D. has served as a member our board of directors since July 2017. Dr. Dere has been Professor of Internal Medicine, B. Lue and Hope S. Bettilyon Presidential Endowed Chair in Internal Medicine for Diabetes Research, and Co-Director of the Clinical and Translational Science Institute at the University of Utah Health Sciences Center since November 2014 and Associate Vice President for Research since September 2019. Prior to his professorship, from 2003 until his retirement in October 2014, Dr. Dere held multiple roles at Amgen, Inc., including Head of Global Development, and both corporate and international Chief Medical Officer, and led development of programs in various therapeutic areas. Dr. Dere serves on the boards of directors of several companies, including BioMarin Pharmaceutical, Inc. since July 2016, Radius Health since November 2014, and Mersana Therapeutics, Inc. since March 2018. He also serves on the boards of directors of privately held companies. From October 2016 to December 2017, he served on the board of directors of Ocera Therapeutics. Dr. Dere received his B.A. in History and Zoology and M.D. from the University of California, Davis, completed his internal medicine residency training at the University of Utah, and his postdoctoral training in endocrinology and metabolism at the University of California, San Francisco. We believe Dr. Dere is qualified to serve on our board of directors due to his extensive academic experience and his knowledge of the biotechnology industry.

Kurt C. Graves has served as a member of our board of directors since November 2015. Mr. Graves has served as the Executive Chairman of i20 Therapeutics, Inc., a biotechnology company, since August 2021. Mr. Graves was previously the Chairman, President and Chief Executive Officer of Intarcia Therapeutics, Inc., a biotechnology company, from September 2010 to December 2020 and on its board of directors from August 2010 to December 2020. Previously, he served as Executive Vice President, Chief Commercial Officer and Head of Strategic Development at Vertex Pharmaceuticals Inc., or Vertex, from July 2007 to October 2009. Prior to joining Vertex, Mr. Graves held various leadership positions at Novartis Pharmaceuticals Corporation, or Novartis Corp., from 1999 to June 2007, including the Global General Medicines Business Unit Head and Chief Marketing Officer for the pharmaceuticals division of Novartis Corp. from September 2003 to June 2007. He served on the boards directors of Radius Health, Inc. from May 2011 to March 2020, and Achillion Pharmaceuticals, Inc. from June 2012 to January 2020. Mr. Graves received a B.S. in Biology from Hillsdale College. We believe Mr. Graves is qualified to serve as a member of our board of directors because of his extensive experience in the life sciences industry, membership on various boards of directors and his leadership and management experience.

Richard N. Kender has served as a member of our board of directors since October 2014. From October 1978 to September 2013, Mr. Kender held positions in a variety of corporate areas at Merck & Co., Inc., or Merck, a pharmaceutical company, most recently serving as Senior Vice President of Business Development and Corporate Licensing. Mr. Kender has served on the boards of directors of Poxel S.A. since March 2015, Bicycle Therapeutics PLC since July 2019, and ReViral Ltd, a privately held company, since November 2019. He previously served on the boards of directors of INC Research Holdings, Inc. between December 2014 and August 2017 and Abide Therapeutics, Inc., a privately held company, between December 2015 and May 2019. Mr. Kender received a B.S. in Accounting from Villanova University and an M.B.A. from Fairleigh Dickinson University. We believe Mr. Kender is qualified to serve on our board of directors because of his finance experience and knowledge of the biotechnology industry.

Eric D. Shaff has served as our President and Chief Executive Officer and a member of our board of directors since January 2019. Previously, he served as our Chief Operating and Financial Officer and Executive Vice President from January 2018 until January 2019 and as our Chief Financial Officer from November 2014 until January 2019. From January 2012 to November 2014, Mr. Shaff was Vice President of Corporate Finance for Momenta Pharmaceuticals, or Momenta, a biotechnology company, where he helped manage Momenta's accounting, finance, planning, and procurement functions, as well as contributing to Momenta's investor relations efforts. Prior to Momenta, Mr. Shaff held a number of corporate development and finance positions with Genzyme Corporation, a biotechnology company, most recently as Vice President of Finance/Controller for the Personalized Genetic Health division. Mr. Shaff has served on the board of directors of Sigilon Therapeutics, Inc. since November 2017. Mr. Shaff received his B.A. from the University of Pennsylvania and his M.B.A. from Cornell University. We believe Mr. Shaff is qualified to serve on our board of directors because of his extensive business and finance experience and his knowledge of the biotechnology industry.

Meryl Zausner has served as a member of our board of directors since August 2018. Ms. Zausner worked for Novartis Pharmaceuticals, Inc., or Novartis, a pharmaceutical company, from 1988 until her retirement in 2017, most recently serving as Chief Financial and Administrative Officer and a member of the Pharmaceutical Executive Committee and Global Finance Leadership Team of Novartis in the United States. At Novartis, she helped launch the Oncology Business Unit, as well as the company's shared services organization. Prior to serving as Chief Financial and Administrative Officer, Ms. Zausner was a member of the Novartis Global Oncology leadership team, where she contributed to the development and commercialization of therapies, including Gleevec® (imatinib). Ms. Zausner has served on the board of directors of Goldfinch Bio, Inc., a privately held company, since February 2021, and she previously served on the boards of directors of the Multiple Myeloma Research Foundation from September 2009 to June 2021 and Neon Therapeutics, Inc. from December 2017 to May 2020. Ms. Zausner received a B.S. in Accounting and Economics from the University at Albany, SUNY. We believe Ms. Zausner is qualified to serve on our board of directors because of her finance and leadership experience and knowledge of the pharmaceutical industry.

Information about our Executive Officers

Name	Age	Position
Eric D. Shaff	46	President, Chief Executive Officer and Director
David Arkowitz	60	Executive Vice President, Chief Financial Officer and Head of Business Development
Paula Cloghessy	50	Executive Vice President and Chief People Officer
Thomas J. DesRosier	67	Executive Vice President and Chief Legal Officer
David S. Ege, Ph.D.	47	Executive Vice President and Chief Technology Officer
Matthew Henn, Ph.D.	47	Executive Vice President and Chief Scientific Officer
Lisa von Moltke, M.D.	63	Executive Vice President and Chief Medical Officer
Teresa L. Young, Ph.D.	55	Executive Vice President, Chief Commercial and Strategy Officer

Information concerning Eric D. Shaff, our President and Chief Executive Officer, may be found above in the section entitled "Director Biographical Information."

David Arkowitz has served as our Executive Vice President, Chief Financial Officer and Head of Business Development since June 2021. Previously, he served as the Chief Financial Officer of Flexion Therapeutics, Inc., a biotechnology company that was acquired by Pacira Biosciences, from May 2018 to May 2021. From September 2013 to May 2018, Mr. Arkowitz served as Chief Operating Officer and Chief Financial Officer at Visterra, Inc., a biotechnology company that was acquired by Otsuka Pharmaceutical Co. He also previously served as Chief Financial Officer at each of Mascoma Corporation, AMAG Pharmaceuticals Inc., and Idenix Pharmaceuticals LLC and held additional leadership positions within each company. Preceding his tenure at Idenix, Mr. Arkowitz spent more than 13 years at Merck & Co., Inc. where he held roles of increasing responsibility, including Vice President and Controller of the U.S. operations, Controller of the global research and development division, and the Chief Financial Officer of Merck's Canadian subsidiary. Mr. Arkowitz has served on the boards of directors of F-star Therapeutics, Inc. since November 2020 and Yumanity Therapeutics, Inc. since December 2020 and previously served on the boards of directors of Spring Bank Pharmaceuticals, Inc. from January 2014 to November 2020 and Proteostasis Therapeutics, Inc. from March 2019 to December 2020. He obtained his B.A. in mathematics at Brandeis University and his M.B.A. in finance at Columbia University Business School.

Paula Cloghessy has served as our Executive Vice President and Chief People Officer since February 2022. Previously, Ms. Cloghessy served in roles of increasing seniority at Translate Bio, Inc., or Translate Bio, a biotechnology company acquired by Sanofi S.A., or Sanofi, a global biopharmaceutical company, from 2016 to December 2021, culminating in her role as Chief People Officer. In these roles, Ms. Cloghessy was responsible for leading human resources and organizational development and performance. Prior to Translate Bio, Ms. Cloghessy held senior roles at Joule Unlimited Technologies, Inc. and Interleukin Genetics, Inc. Ms. Cloghessy received her B.A. in Psychology from University of Massachusetts, Boston.

Thomas J. DesRosier has served as our Chief Legal Officer, Executive Vice President, and Secretary since May 2016. Previously, he served as Executive Vice President, Chief Legal and Administrative Officer and Secretary of ARIAD Pharmaceuticals, Inc., a biopharmaceutical company, from 2015 to 2016, Executive Vice President, Chief Legal and Administrative Officer and Secretary of Cubist Pharmaceuticals, Inc., or Cubist, a biopharmaceutical company, from 2014 to 2015 and Senior Vice President, Chief Legal Officer and Secretary of Cubist from 2013 to 2014. Before that, Mr. DesRosier served as Senior Vice President, General Counsel North America of Sanofi from 2011 to 2013. From 1999 to 2011, Mr. DesRosier held leadership roles of increasing seniority within the legal group of Genzyme Corporation, a biotechnology company, culminating in his role as Senior Vice President, Chief Legal Officer. Mr. DesRosier has served as a member of the board of directors of Avanir Pharmaceuticals, a privately held company and wholly-owned subsidiary of Otsuka Pharmaceutical Company, Ltd., since June 2017. Mr. DesRosier earned a B.A. in Chemistry from the University of Vermont and a J.D. from Wake Forest University School of Law.

David S. Ege, Ph.D. has served as our Executive Vice President and Chief Technology Officer since October 2020. Previously, Dr. Ege served in a variety of technical and leadership roles in R&D and manufacturing at Merck from November 2003 to October 2020, most recently as global lead for digital strategy in Merck's Manufacturing Division from June 2019 to October 2020. From April 2015 to June 2019, Dr. Ege served as Executive Director of Vaccines & Biologics Manufacturing at Merck's plant in Elkton, Virginia, where he led bulk manufacturing operations for Gardasil®, Gardasil9® and Cancidas®. He has contributed to the successful first-in-class licensure and launch of cervical cancer vaccines, Gardasil® (2006) and Gardasil9® (2014), and a breakthrough cancer immunotherapy, Keytruda® (2014). He graduated summa cum laude from Princeton with a B.S.E. in chemical engineering and earned his Ph.D. in chemical engineering from the University of Pennsylvania.

Matthew Henn, Ph.D. has served as our Executive Vice President and Chief Scientific Officer since February 2019. Since joining our company at its launch in June 2012, he has held positions of increasing seniority, most recently as Executive Vice President, Head of Discovery and Microbiome R&D from January 2018 to February 2019, and previously as Senior Vice President, Head of Discovery and Bioinformatics from June 2012 to January 2018. Prior to joining our company, he was the Director of Viral Genomics and Assistant Director of the Genome Sequencing Center for Infectious Diseases at the Broad Institute of the Massachusetts Institute of

Technology and Harvard. He currently serves on the scientific advisory boards of the Forsyth Institute and Growcentia, Inc., an agricultural microbiome company. Dr. Henn earned his B.S. in Ecology and Evolutionary Sciences from the University of New Hampshire and his Ph.D. in Ecosystem Sciences from the University of California at Berkeley, where he was a NASA Earth Systems Sciences Fellow, and trained as a NSF Postdoctoral Fellow in Microbiology at Duke University.

Lisa von Moltke, M.D. has served as our Executive Vice President and Chief Medical Officer since March 2020. Previously, Dr. von Moltke worked for Alkermes, Inc., a pharmaceutical company, from June 2015 to December 2019, where she served in roles of increasing seniority, culminating as Senior Vice President and Head of Clinical Development. Beginning in June 2015, Dr. Moltke served as VP Clinical Pharmacology, DMPK and Bioanalytics, was promoted to Head of Clinical Development in November 2015, and became SVP in June 2018. Prior to joining Alkermes, Dr. von Moltke served as Vice President Clinical Pharmacology at Sanofi/Genzyme Corporation, a biotechnology company, from 2009 to 2015 and was US Head Clinical & Exploratory Pharmacology Sciences (CEP) and Early Development. Starting in 2014 she was Head CEP for Japan and China regions. From 2006 to 2009, Dr. von Moltke was Head, Translational Medicine for the Takeda Oncology Company, a biopharmaceutical company, in Cambridge, MA. She has served as President of the American College of Clinical Pharmacology, and as the Editor-in-Chief of The Journal of Clinical Pharmacology. Dr. von Moltke earned a B.A. degree at Wellesley College and her M.D. from Michigan State University, College of Human Medicine.

Teresa L. Young, Ph.D. has served as our Executive Vice President, Chief Commercial and Strategy Officer since June 2020. Previously, Dr. Young served as Vice President, Global Commercial Strategy at Sage Therapeutics from March 2018 to June 2020, where she led development of Sage's global commercial capabilities, including global marketing, insights and analytics and new product planning. Prior to that, she held commercial leadership roles of increasing responsibility at Bristol-Myers Squibb from November 2010 to March 2018, culminating in her role as Vice President and General Manager, Cardiovascular, in which she led the global ELIQUIS® business to become the company's largest product by revenue. Earlier in her career, Dr. Young held marketing and sales roles at GlaxoSmithKline from June 1993 to November 2010, where she catalyzed growth for the company's Urology, Diabetes and NeuroHealth organizations. Dr. Young is a member of the Women in Bio and Healthcare Businesswomen's Association and served on the Advisory Board of the Healthcare Businesswomen's Association. Dr. Young received her B.S. in pharmacy and her Ph.D. in healthcare marketing from the University of South Carolina.

Code of Ethics

Our board of directors has adopted a Code of Business Conduct and Ethics applicable to all officers, directors and employees, which is available on our website at www.serestherapeutics.com in the "Investors and News" section under "Corporate Governance." We intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K regarding amendment to, or waiver from, a provision of our Code of Business Conduct and Ethics, as well as Nasdaq's requirement to disclose waivers with respect to directors and executive officers, by posting such information on our website at the address and location specified in the preceding sentence. The information contained on our website is not incorporated by reference into this Annual Report on Form 10-K.

Other

The remainder of the information required to be disclosed by this item will be contained in the Proxy Statement for our Annual Meeting of Stockholders scheduled to be held on June 22, 2022 and is incorporated herein by reference.

Item 11. Executive Compensation

The information required to be disclosed by this item will be contained in the Proxy Statement for our Annual Meeting of Stockholders scheduled to be held on June 22, 2022 and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required to be disclosed by this item will be contained in the Proxy Statement for our Annual Meeting of Stockholders scheduled to be held on June 22, 2022 and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions and Director Independence

The information required to be disclosed by this item will be contained in the Proxy Statement for our Annual Meeting of Stockholders scheduled to be held on June 22, 2022 and is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services

The information required to be disclosed by this item will be contained in the Proxy Statement for our Annual Meeting of Stockholders scheduled to be held on June 22, 2022 and is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statements Schedules

(a)(1) Financial Statements.

See the "Index to Consolidated Financial Statements" on page F-1 below for the list of financial statements filed as part of this report.

(a)(2) Financial Statement Schedules.

All schedules have been omitted because they are not required or because the required information is given in the Consolidated Financial Statements or Notes thereto set forth below beginning on page F-1.

(a)(3) Exhibits.

The following is a list of all exhibits filed as a part of this Annual Report on Form 10-K.

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed/ Furnished Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Restated Certificate of Incorporation, filed on July 1, 2015	8-K	001-37465	3.1	7/1/15	
3.2	Amended and Restated By-Laws	8-K	001-37465	3.2	12/7/20	
4.1	Specimen Stock Certificate evidencing the shares of common stock	S-1/A	333-204484	4.2	6/16/15	
4.2	Description of Capital Stock	10-K	001-37465	4.2	3/2/21	
10.1#	2015 Incentive Award Plan and forms of award agreements thereunder	10-K	001-37465	10.1	3/2/21	
10.2#	2015 Employee Stock Purchase Plan	S-1/A	333-204484	10.3	6/16/15	
10.3#	2012 Stock Incentive Plan, as amended and form of option agreement thereunder	S-1	333-204484	10.1	5/27/15	
10.4#	Non-Employee Director Compensation Program	10-Q	001-37465	10.3	11/10/21	
10.5	Lease Agreement, dated April 1, 2015, by and between the Registrant and ARE-MA Region No. 38, LLC	S-1	333-204484	10.13	5/27/15	
10.6	Lease, dated November 11, 2015, by and between the Registrant and BMR-Sidney Research Campus, LLC	10-K	001-37465	10.13	3/14/16	
10.7	Sublease Agreement dated July 1, 2019, by and between the Registrant and Flagship VL56, Inc., and Flagship VL58, Inc.	10-Q	001-37465	10.3	11/5/19	
10.8#	Second Amended and Restated Employment Agreement, dated January 29, 2021, by and between the Registrant and Eric D. Shaff	8-K	001-37465	10.1	2/1/21	
10.9#	Amended and Restated Employment Agreement, dated January 29, 2021 by and between the Registrant and Thomas J. DesRosier	8-K	001-37465	10.2	2/1/21	
10.10#	Second Amended and Restated Employment Agreement, dated January 29, 2021, by and between the Registrant and Matthew R. Henn, Ph.D.	8-K	001-37465	10.3	2/1/21	
10.11#	Amended and Restated Employment Agreement, dated January 29, 2021, by and between the Registrant and David S. Ege, Ph.D.	10-Q	001-37465	10.2	8/3/21	
10.12#	Letter Agreement, dated November 4, 2021, by and between the Registrant and David S. Ege, Ph.D.	10-Q	001-37465	10.2	11/10/21	

10.13#	Amended and Restated Employment Agreement, dated January 29, 2021, by and between the Registrant and Teresa L. Young	10-K	001-37465	10.13	3/2/21	
10.14#	Amended and Restated Employment Agreement, dated January 29, 2021, by and between the Registrant and Lisa von Moltke, M.D.	10-K	001-37465	10.14	3/2/21	
10.15#	Employment Agreement, dated May 10, 2021 by and between the Registrant and David Arkowitz	8-K	001-37465	10.1	5/20/21	
10.16#	Employment Agreement, dated January 5, 2022, by and between the Registrant and Paula Cloghessy					*
10.17	Loan and Security Agreement, dated October 29, 2019, between the Registrant and Hercules Capital, Inc.	8-K	001-37465	10.1	11/4/19	
10.18	First Amendment to Loan and Security Agreement by and between the Registrant and Hercules Capital, Inc., dated April 16, 2020	10-Q	001-37465	10.2	7/28/20	
10.19	Second Amendment to Loan and Security Agreement, dated February 24, 2022 by and between the Registrant and Hercules Capital, Inc.					*
10.20^	Collaboration and License Agreement, dated January 9, 2016, by and between the Registrant and Société des Produits Nestlé S.A.	10-Q	001-37465	10.1	5/16/16	
10.21	Amendment No. 1 to the Collaboration and License Agreement, dated August 10, 2016, by and between the Registrant and Nestec Ltd.	10-K	001-37465	10.22	3/6/19	
10.22^	Letter Agreement dated October 30, 2018, by and between the Registrant and Nestec Ltd.	10-K	001-37465	10.23	3/6/19	
10.23	Securities Purchase Agreement, dated August 12, 2020 by and between the Company and Société des Produits Nestlé S.A.	8-K	001-37465	10.1	8/14/20	
10.24†	License Agreement, dated July 1, 2021, by and between the Registrant and NHSc Pharma Partners	10-Q	001-37465	10.1	11/10/21	
10.25†	Long Term Manufacturing Agreement, dated November 8, 2021, by and between the Registrant and BacThera AG					*
21.1	Subsidiaries of Seres Therapeutics, Inc.	10-K	001-37465	21.1	3/2/20	
23.1	Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm					*
31.1	Rule 13a-14(a)/15d-14(a) Certification of Chief Executive Officer					*
31.2	Rule 13a-14(a)/15d-14(a) Certification of Chief Financial Officer					*
32.1	Section 1350 Certification of Chief Executive Officer					**
32.2	Section 1350 Certification of Chief Financial Officer					**
101.INS	Inline XBRL Instance Document- the Instance Document does not appear in the interactive data file because its XBRL tags are embedded within the Inline XBRL document					*
101.SCH	Inline XBRL Taxonomy Extension Schema Document					*
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document					*

101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document	*
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document	*
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document	*
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)	*

* Filed herewith.
** Furnished herewith.
Indicates management contract or compensatory plan.
^ Confidential treatment has been granted with respect to redacted portions of this exhibit. Redacted portions of this exhibit have been filed separately with the SEC.
† Portions of this exhibit (indicated by asterisks) have been omitted pursuant to Regulation S-K, Item 601(b)(10)(iv). Such omitted information is both (i) not material and (ii) the type that the Registrant treats as private or confidential.

Item 16. Form 10-K Summary

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

SERES THERAPEUTICS, INC.

Date: March 1, 2022

By: /s/ Eric D. Shaff
Eric D. Shaff
President, Chief Executive Officer and Director

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Eric D. Shaff Eric D. Shaff	President, Chief Executive Officer and Director (Principal Executive Officer)	March 1, 2022
/s/ David Arkowitz David Arkowitz	Executive Vice President, Chief Financial Officer, and Head of Business Development (Principal Financial and Accounting Officer)	March 1, 2022
/s/ Stephen Berenson Stephen Berenson	Chairman of the Board	March 1, 2022
/s/ Dennis A. Ausiello Dennis A. Ausiello, M.D.	Director	March 1, 2022
/s/ Paul R. Biondi Paul R. Biondi	Director	March 1, 2022
/s/ Willard H. Dere Willard H. Dere, M.D.	Director	March 1, 2022
/s/ Grégory Behar Grégory Behar	Director	March 1, 2022
/s/ Kurt C. Graves Kurt C. Graves	Director	March 1, 2022
/s/ Richard N. Kender Richard N. Kender	Director	March 1, 2022
/s/ Meryl S. Zausner Meryl S. Zausner	Director	March 1, 2022

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Seres Therapeutics, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Seres Therapeutics, Inc. and its subsidiaries (the "Company") as of December 31, 2021 and 2020, and the related consolidated statements of operations and comprehensive loss, of stockholders' equity (deficit) and of cash flows for each of the three years in the period ended December 31, 2021, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Annual Report on Internal Control Over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting 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 in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements 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. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Emphasis of Matter

As discussed in Note 1 to the consolidated financial statements, the Company will require additional financing to fund future operations. Management's evaluation of the events and conditions and management's plans to mitigate these matters are also described in Note 1.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Revenue Recognition – Collaboration and License Agreement with Société des Produits Nestlé S.A. (Nestlé) Recognized Under an Input Method

As described in Notes 2 and 12 to the consolidated financial statements, the Company recognizes revenue arising from a collaboration and license agreement with Nestlé, which totaled $10.4 million for the year ended December 31, 2021. The promised goods and services represent one combined performance obligation and the entire transaction price was allocated to that single combined performance obligation. When management concludes that a contract should be accounted for as a combined performance obligation and recognized over-time, management must then determine the period over which revenue should be recognized and the method by which to measure revenue. Management generally recognizes revenue using a cost-based input method, which measures the extent of progress towards completion based on the ratio of actual costs incurred to the total estimated costs expected upon satisfying the performance obligation. Due to the nature of the work required to be performed to satisfy the performance obligation, management's estimation of costs expected is complex and requires significant judgment.

The principal considerations for our determination that performing procedures relating to revenue recognition for the collaboration and license agreement with Nestlé recognized under an input method is a critical audit matter are the significant judgment by management when determining the total estimated costs expected upon satisfying the performance obligation, which in turn led to significant auditor judgment, subjectivity and effort in performing procedures to evaluate the total estimated costs expected upon satisfying the performance obligation.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the revenue arising from the collaboration and license agreement with Nestlé, including controls over the total estimated costs expected upon satisfying the performance obligation. These procedures also included, among others, evaluating and testing management's process for determining the total estimated costs expected upon satisfying the performance obligation, which included testing actual costs incurred and evaluating the reasonableness of estimated costs to satisfy the performance obligation. Evaluating the reasonableness of estimated costs to satisfy the performance obligation involved assessing management's ability to reasonably estimate costs to satisfy the performance obligation by (i) evaluating the appropriateness of changes to management's estimates of total costs to satisfy the performance obligation; (ii) performing a comparison of management's prior period cost estimates to actual costs incurred; and (iii) evaluating whether the cost estimates used by management were reasonable considering consistency with industry and company-specific data.

/s/ PricewaterhouseCoopers LLP
Boston, Massachusetts
March 1, 2022

We have served as the Company's auditor since 2014.

SERES THERAPEUTICS, INC.
CONSOLIDATED BALANCE SHEETS
(In thousands, except share and per share data)

	December 31, 2021	December 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	$ 180,002	$ 116,049
Short term investments	110,704	137,567
Prepaid expenses and other current assets	12,922	5,774
Accounts receivable	—	9,387
Total current assets	303,628	268,777
Property and equipment, net	17,938	13,897
Operating lease assets	18,208	9,041
Restricted cash	8,000	—
Restricted investments	1,401	1,400
Long term investments	495	49,825
Other non-current assets	5,189	—
Total assets	$ 354,859	$ 342,940
Liabilities and Stockholder's Equity		
Current liabilities:		
Accounts payable	$ 13,735	$ 4,018
Accrued expenses and other current liabilities (1)	45,094	14,226
Operating lease liabilities	6,610	5,115
Short term portion of note payable, net of discount	—	454
Deferred revenue - related party	16,819	22,602
Total current liabilities	82,258	46,415
Long term portion of note payable, net of discount	24,643	24,639
Operating lease liabilities, net of current portion	17,958	10,561
Deferred revenue, net of current portion - related party	86,998	85,572
Other long-term liabilities (2)	11,495	1,003
Total liabilities	223,352	168,190
Commitments and contingencies (Note 14)		
Stockholders' equity:		
Preferred stock, $0.001 par value; 10,000,000 shares authorized at December 31, 2021 and 2020; no shares issued and outstanding at December 31, 2021 and 2020	—	—
Common stock, $0.001 par value; 200,000,000 shares authorized at December 31, 2021 and 2020; 91,889,418 and 91,459,239 shares issued and outstanding at December 31, 2021 and 2020	92	91
Additional paid-in capital	745,829	723,482
Accumulated other comprehensive loss	(60)	(47)
Accumulated deficit	(614,354)	(548,776)
Total stockholders' equity	131,507	174,750
Total liabilities and stockholders' equity	$ 354,859	$ 342,940

[1] Includes related party amounts of $21,098 and $0 at December 31, 2021 and December 31, 2020, respectively (see Note 12)
[2] Includes related party amounts of $10,585 and $0 at December 31, 2021 and December 31, 2020, respectively (see Note 12)

The accompanying notes are an integral part of these consolidated financial statements.

SERES THERAPEUTICS, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS
(In thousands, except share and per share data)

	Year Ended December 31,		
	2021	2020	2019
Revenue:			
Collaboration revenue - related party	$ 143,857	$ 11,897	$ 27,188
Grant revenue	1,070	4,157	1,102
Collaboration revenue	—	17,161	6,215
Total revenue	144,927	33,215	34,505
Operating expenses:			
Research and development expenses	$ 141,891	$ 90,570	$ 80,141
General and administrative expenses	69,261	30,775	24,748
Collaboration (profit) loss sharing - related party	(1,732)	—	—
Restructuring expenses	—	—	1,492
Total operating expenses	209,420	121,345	106,381
Loss from operations	(64,493)	(88,130)	(71,876)
Other (expense) income:			
Interest income	2,870	946	1,033
Interest expense	(2,910)	(2,924)	(502)
Other (expense) income	(1,045)	981	1,066
Total other (expense) income, net	(1,085)	(997)	1,597
Net loss	$ (65,578)	$ (89,127)	$ (70,279)
Net loss per share attributable to common stockholders, basic and diluted	$ (0.72)	$ (1.12)	$ (1.24)
Weighted average common shares outstanding, basic and diluted	91,702,866	79,789,220	56,649,220
Other comprehensive loss:			
Unrealized loss on investments, net of tax of $0	(12)	(47)	—
Currency translation adjustment	(1)	—	—
Total other comprehensive loss	(13)	(47)	—
Comprehensive loss	$ (65,591)	$ (89,174)	$ (70,279)

The accompanying notes are an integral part of these consolidated financial statements.

SERES THERAPEUTICS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (DEFICIT)
(In thousands, except share data)

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Total Stockholders Equity (Deficit)
	Shares	Par Value				
Balance at December 31, 2018	40,936,735	$ 41	$ 341,284	$ -	$ (389,370)	$ (48,045)
Issuance of common stock from public offering, net of commissions, underwriting discounts and offering costs	28,818,578	29	60,498	—	—	60,527
Issuance of common stock from at the market equity offering	128,400	—	512	—	—	512
Issuance of common stock upon exercise of stock options	90,125	—	145	—	—	145
Issuance of common stock upon vesting of RSUs, net of tax withholdings	94,400	—	176	—	—	176
Issuance of common stock under ESPP plan	75,014	—	296	—	—	296
Stock-based compensation expense	—	—	8,344	—	—	8,344
Net loss	—	—	—	—	(70,279)	(70,279)
Balance at December 31, 2019	70,143,252	70	411,255	—	(459,649)	(48,324)
Issuance of common stock from public offering, net of commissions, underwriting discounts and offering costs	12,075,000	12	243,736	—	—	243,748
Issuance of common stock from Securities Purchase Agreement, net of offering costs - related party	959,002	1	19,899	—		19,900
Issuance of common stock from at the market equity offering	5,787,681	6	24,767	—	—	24,773
Issuance of common stock upon exercise of stock options	2,214,011	2	14,419	—	—	14,421
Issuance of common stock upon vesting of RSUs, net of tax withholdings	125,000	—	120	—	—	120
Issuance of common stock under ESPP plan	155,293	—	462	—	—	462
Stock-based compensation expense	—	—	8,824	—	—	8,824
Other comprehensive loss	—	—	—	(47)	—	(47)
Net loss	—	—	—	—	(89,127)	(89,127)
Balance at December 31, 2020	91,459,239	91	723,482	(47)	(548,776)	174,750
Issuance of common stock upon exercise of stock options	329,112	1	1,298	—	—	1,299
Issuance of common stock under ESPP plan	100,417	—	827	—	—	827
Issuance of common stock upon vesting of RSUs, net of tax withholdings	650	—	—	—	—	—
Stock-based compensation expense	—	—	20,222	—	—	20,222
Other comprehensive loss	—	—	—	(13)	—	(13)
Net loss	—	—	—	—	(65,578)	(65,578)
Balance at December 31, 2021	91,889,418	$ 92	$ 745,829	$ (60)	$ (614,354)	$ 131,507

The accompanying notes are an integral part of these consolidated financial statements.

SERES THERAPEUTICS, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year Ended December 31,		
	2021	2020	2019
Cash flows from operating activities:			
Net loss	$ (65,578)	$ (89,127)	$ (70,279)
Adjustments to reconcile net loss to net cash provided by (used in) operating activities:			
Stock-based compensation expense	20,222	8,824	8,344
Depreciation and amortization expense	5,947	6,578	7,603
Non-cash operating lease cost	3,275	2,315	2,227
Amortization of debt issuance costs	498	446	281
Accretion (amortization) of discount (premium) on issued debt securities	2,526	551	(172)
Loss on disposal of property and equipment	—	—	103
Collaboration (profit) loss sharing - related party	(1,732)	—	—
Changes in operating assets and liabilities:			
Prepaid expenses and other current and non-current assets	(12,337)	(2,186)	3,257
Accounts receivable	9,387	(7,602)	(1,785)
Deferred revenue	(4,357)	(11,565)	(17,520)
Accounts payable	9,362	(1,159)	(1,460)
Operating lease liabilities	(3,550)	(4,456)	(4,211)
Accrued expenses and other liabilities (3)	43,025	3,771	(2,908)
Net cash provided by (used in) operating activities	6,688	(93,610)	(76,520)
Cash flows from investing activities:			
Purchases of property and equipment	(9,566)	(591)	(1,002)
Purchases of investments	(95,971)	(218,284)	(46,420)
Sales and maturities of investments	169,625	59,984	16,904
Net cash provided by (used in) investing activities	64,088	(158,891)	(30,518)
Cash flows from financing activities:			
Proceeds from public offering of common stock, net of commissions, underwriting discounts and offering costs	—	243,748	60,527
Proceeds from Securities Purchase Agreement, net of issuance costs - related party	—	19,900	—
Proceeds from issuance of note payable	—	—	25,000
Proceeds from at the market equity offering, net of commissions	—	24,773	512
Payments of debt issuance costs	—	—	(425)
Proceeds from exercise of stock options	1,299	14,421	145
Proceeds from issuance of common stock and restricted common stock	—	120	176
Issuance of common stock under ESPP plan	827	462	296
Repayment of notes payable	(948)	—	—
Net cash provided by financing activities	1,178	303,424	86,231
Net increase (decrease) in cash, cash equivalents and restricted cash	71,954	50,923	(20,807)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(1)	—	—
Cash, cash equivalents and restricted cash at beginning of year	116,049	65,126	85,933
Cash, cash equivalents and restricted cash at end of year	$ 188,002	$ 116,049	$ 65,126
Supplemental disclosure of cash flow information:			
Cash paid for interest	$ 2,446	$ 2,453	$ 221
Supplemental disclosure of non-cash investing and financing activities:			
Property and equipment purchases included in accounts payable and accrued expenses	$ 874	$ 451	$ 62
Lease liability arising from obtaining right-of-use assets	12,442	—	154

[3] Includes related party amounts of $31,683 and $0 at December 31, 2021 and December 31, 2020 respectively (see Note 12)

The accompanying notes are an integral part of these consolidated financial statements.

1. Nature of the Business and Basis of Presentation

Seres Therapeutics, Inc. (the "Company") was incorporated under the laws of the State of Delaware in October 2010 under the name Newco LS21, Inc. In October 2011, the Company changed its name to Seres Health, Inc., and in May 2015, the Company changed its name to Seres Therapeutics, Inc. The Company is a microbiome therapeutics platform company developing a novel class of biological drugs, which are designed to treat disease by modulating the microbiome to restore health by repairing the function of a disrupted microbiome to a non-disease state. The Company's lead product candidate, SER-109, is designed to reduce further recurrences of *Clostridioides difficile* infection ("CDI"), a debilitating infection of the colon, in patients who have received antibiotic therapy for recurrent CDI by restructuring the colonic microbiome and changing its function. If approved by the U.S. Food and Drug Administration ("FDA"), we believe SER-109 will be a first-in-field oral microbiome drug. Building upon SER-109, the Company is developing therapeutics, such as SER-155, to specifically target infections and antimicrobial resistance. SER-155, a microbiome therapeutic candidate consisting of a consortium of cultivated bacteria, is designed to reduce incidences of gastrointestinal infections, bloodstream infections and graft versus host disease (GvHD") in patients receiving allogeneic hematopoietic stem cell transplantation ("allo-HSCT"). In addition, using its microbiome therapeutics platform, the Company is developing SER-287 and SER-301 to treat ulcerative colitis ("UC"). The Company continues to evaluate microbiome pharmacokinetic and pharmacodynamic data from across its clinical and pre-clinical portfolios, using its reverse translation microbiome therapeutics capabilities to conduct research on various indications, including inflammatory and immune diseases, cancer, and metabolic diseases.

The Company is subject to risks common to companies in the biotechnology industry including, but not limited to, new technological innovations, protection of proprietary technology, dependence on key personnel, compliance with government regulations and the need to obtain additional financing. Product candidates currently under development will require significant additional research and development efforts, including extensive preclinical and clinical testing and regulatory approval, prior to commercialization. These efforts require significant amounts of additional capital, adequate personnel infrastructure and extensive compliance-reporting capabilities.

The Company's product candidates are in development. There can be no assurance that the Company's research and development will be successfully completed, that adequate protection for the Company's intellectual property will be obtained, that any products developed will obtain necessary government regulatory approval or that any approved products will be commercially viable. Even if the Company's product development efforts are successful, it is uncertain when, if ever, the Company will generate significant revenue from product sales. The Company operates in an environment of rapid change in technology and substantial competition from pharmaceutical and biotechnology companies. In addition, the Company is dependent upon the services of its employees and consultants.

Under Accounting Standards Update ("ASU") 2014-15, *Presentation of Financial Statements—Going Concern* (Subtopic 205-40) ("ASC 205-40"), the Company has the responsibility to evaluate whether conditions and/or events raise substantial doubt about its ability to meet its future financial obligations as they become due within one year after the date that the financial statements are issued. As required by ASC 205-40, this evaluation shall initially not take into consideration the potential mitigating effects of plans that have not been fully implemented as of the date the financial statements are issued.

As of December 31, 2021, the Company had an accumulated deficit of $614,354 and cash, cash equivalents and short- and long-term investments of $291,201. For the year ended December 31, 2021, the Company incurred a net loss of $65,578. The Company expects that its operating losses and negative cash flows will continue for the foreseeable future. The Company expects that its cash, cash equivalents and short and long-term investments as of December 31, 2021 of $291,201, and proceeds, net of facility fees and expenses, of $27,600 received in February 2022 in connection with the Second Amendment (Note 18), will be sufficient to fund its operating expenses, capital expenditure requirements, and debt service obligations for at least the next 12-months from issuance of the financial statements. 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 eligible to receive contingent milestone payments under its license and collaboration agreement with Société des Produits Nestlé S.A., successor in interest to Nestec Ltd., and NHSc Pharma Partners (collectively, "Nestlé") if certain development, regulatory approval or sales target milestones are achieved. NHSc Pharma Partners is affiliated with Société des Produits Nestlé S.A. and Nestlé Health Science US Holdings, Inc. ("Nestlé Health Science"), both of which are significant stockholders of the Company. The milestone payments are uncertain and there is no assurance that the Company will receive any of them. Until such time, if ever, as the Company can generate substantial product revenue, the Company will finance its cash needs through a combination of public or private equity offerings, debt financings, governmental funding, collaborations, strategic partnerships or marketing, distribution or licensing arrangements with third parties. The Company may not be able to obtain funding on acceptable terms, or at all. If the Company is unable to raise additional funds as and when needed, it would have a negative impact on the Company's financial condition, which

may require the Company to delay, reduce or eliminate certain research and development activities and reduce or eliminate discretionary operating expenses, which could constrain the Company's ability to pursue its business strategies.

The accompanying financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America ("GAAP") and include the accounts of the Company and its wholly owned subsidiaries after elimination of all intercompany accounts and transactions.

2. Summary of Significant Accounting Policies

Use of Estimates

The preparation of 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, revenue recognition and the accrual of research and development expenses. Estimates are periodically reviewed in light of changes in circumstances, facts and experience. Actual results could differ from the Company's estimates.

The full extent to which the COVID-19 pandemic will directly or indirectly impact the Company's business, results of operations and financial condition, including revenue, operating expenses, clinical trials and employee-related amounts, will depend on future developments that are highly uncertain, including new information that may emerge concerning COVID-19 and the actions taken to contain it or treat its impact and the economic impact on local, regional, national and international markets. We have made estimates of the impact of COVID-19 within our financial statements and there may be changes to those estimates in future periods. Actual results could differ from the Company's estimates.

Cash Equivalents

The Company considers all short-term, highly liquid investments with original maturities of 90 days or less at acquisition date to be cash equivalents. Cash equivalents, which consist of money market accounts, commercial paper and corporate bonds purchased with original maturities of less than 90 days from the date of purchase, are stated at fair value.

Investments

The Company classifies its available-for-sale marketable debt securities as current assets on the consolidated balance sheet if they mature within one year from the balance sheet date. Any available-for-sale marketable debt securities with maturities greater than one year from the balance sheet date are classified as long-term assets on the consolidated balance sheet.

The Company classifies all of its marketable debt securities as available-for-sale securities. Accordingly, these marketable debt securities are recorded at fair value and unrealized gains and losses are reported as a separate component of accumulated other comprehensive loss in stockholders' equity (deficit). The cost of securities sold is determined on a specific identification basis, and realized gains and losses are included in other income (expense) within the consolidated statement of operations and comprehensive loss. If any adjustment to fair value reflects a decline in the value of the investment that the Company considers to be "other than temporary", the Company reduces the investment to fair value through a charge to the consolidated statement of operations and comprehensive loss. No such adjustments were necessary during the periods presented.

Restricted Investments

The Company held investments of $1,401 and $1,400 as of December 31, 2021 and December 31, 2020, respectively, in a separate restricted bank account as a security deposit for the lease of the Company's headquarters in Cambridge, MA. The Company has classified these deposits as long-term restricted investments on its balance sheet.

Restricted Cash

The Company held restricted cash of $8,000 and $0 as of December 31, 2021 and December 31, 2020, respectively, which represents cash held for the benefit of the landlord for the Company's other leases. The Company has classified the restricted cash as long-term on its consolidated balance sheet as the underlying leases are greater than 1 year.

Cash, cash equivalents and restricted cash were comprised of the following:

	December 31 2021	December 31, 2020
Cash and cash equivalents	$ 180,002	$ 116,049
Restricted cash, non-current	8,000	—
Total cash, cash equivalents and restricted cash	$ 188,002	$ 116,049

Concentration of Credit Risk and of Significant Suppliers

Financial instruments that potentially expose the Company to concentrations of credit risk consist primarily of cash, cash equivalents and investments. The Company has all cash, cash equivalents and investments balances at accredited financial institutions, in amounts that exceed federally insured limits. The Company does not believe that it is subject to unusual credit risk beyond the normal credit risk associated with commercial banking relationships.

The Company is dependent on third-party manufacturers to supply products for research and development activities of its programs, including preclinical and clinical testing. These programs could be adversely affected by a significant interruption in the supply of such drug substance products.

Fair Value Measurements

Certain assets and liabilities 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 and 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 and investments are carried at fair value, determined according to the fair value hierarchy described above. The Company’s investments in certificates of deposit are carried at amortized cost, which approximates fair value. The carrying values of the Company’s accounts receivable, prepaid expense and other current assets, accounts payable and accrued expenses approximates their fair value 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.

Property and Equipment

Property and equipment are stated at cost less accumulated depreciation. Depreciation expense is recognized using the straight-line method over the useful life of the asset. Laboratory equipment is depreciated over five years. Computer equipment and furniture and office equipment are depreciated over three years. Leasehold improvements are amortized over the shorter of the lease term or the estimated useful life of the related asset. Expenditures for repairs and maintenance of assets are charged to expense as incurred. Upon retirement or sale, the cost and related accumulated depreciation of assets disposed of are removed from the accounts and any resulting gain or loss is included in loss from operations.

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 for recoverability, the Company compares forecasts of undiscounted cash flows expected to result from the use and eventual disposition of the long-lived asset to its carrying value. An

impairment loss would be recognized when estimated undiscounted future cash flows expected to result from the use of an asset are less than its carrying amount. The impairment loss would be based on the excess of the carrying value of the impaired asset over its fair value, determined based on discounted cash flows. To date, the Company has not recorded any impairment losses on long-lived assets.

Research and Development Costs

Research and development costs are expensed as incurred. Research and development expenses include salaries, stock-based compensation and benefits of employees, third-party license fees and other operational costs related to the Company's research and development activities, including allocated facility-related expenses and external costs of outside vendors engaged to conduct both preclinical studies and clinical trials.

Research Contract Costs and Accruals

The Company has entered into various research and development contracts with research institutions and other companies. These agreements are generally cancelable, and related payments are recorded as research and development expenses as incurred. The Company records accruals for estimated ongoing research costs. When evaluating the adequacy of the accrued liabilities, the Company analyzes progress of the studies, including the phase or completion of events, invoices received and contracted costs. Significant judgments and estimates are made in determining the accrued balances at the end of any reporting period. Actual results could differ from the Company's estimates. The Company's historical accrual estimates have not been materially different from the actual costs.

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 expenditure. Amounts incurred are classified as general and administrative expenses.

Accounting for Stock-Based Compensation

The Company measures all stock options and other stock-based awards granted to employees, non-employees, and directors based on the fair value on the date of the grant and recognizes compensation expense of those awards over the requisite service period, which is generally the vesting period of the respective award. Generally, the Company issues stock options, restricted stock units and restricted stock awards with only service-based vesting conditions and records the expense for these awards using the straight-line method. For stock options or restricted stock units issued with performance-based vesting conditions, the stock compensation expense related to these awards is recognized based on the grant date fair value when achievement of the performance condition is deemed probable.

The Company classifies stock-based compensation expense in its consolidated statement of operations and comprehensive loss in the same manner in which the award recipient's payroll costs are classified or in which the award recipients' service payments are classified.

The Company accounts for forfeitures of stock-based awards as they occur rather than applying an estimated forfeiture rate to stock-based compensation expense.

The fair value of each stock option grant is estimated on the date of grant using the Black- Scholes option-pricing model. The Company estimates its expected stock volatility based on a blended rate of the Company's own common stock volatility and the average historical volatility of a publicly traded set of peer companies. The Company uses the simplified method prescribed by Securities and Exchange Commission Staff Accounting Bulletin No. 107, *Share-Based Payment*, to calculate the expected term of options granted to employees, non-employees and directors. 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 and does not expect to pay any cash dividends in the foreseeable future.

Revenue Recognition

The Company recognizes revenue in accordance with the guidance under ASC 606, *Revenue from Contracts with Customers*. ASC 606 applies to all contracts with customers, except those contracts that are within the scope of other guidance, such as leases, insurance, and financial instruments. The Company enters into agreements that are within the scope of ASC 606, under which the

Company licenses certain of the Company's product candidates and performs research and development services in connection with such arrangements. The terms of these arrangements typically include payment of one or more of the following: nonrefundable up-front fees, reimbursement of research and development costs, development, clinical, regulatory and commercial sales milestone payments, and royalties on net sales of licensed products. Under ASC 606, an entity recognizes revenue when its 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. When determining the timing and extent of revenue recognition for arrangements that the Company determines are within the scope of ASC 606, the Company performs the following five steps:

a. identify the contract(s) with a customer;

b. identify the performance obligations in the contract;

c. determine the transaction price;

d. allocate the transaction price to the performance obligations in the contract; and

e. recognize revenue when (or as) the entity satisfies a performance obligation.

The Company only applies the five-step model to contracts when it is probable that the entity will collect the consideration to which it is entitled in exchange for the goods or services transferred to the customer.

At contract inception, once the contract is determined to be within the scope of ASC 606, the Company assesses the goods or services promised within the contract to determine whether each promised good or service is a performance obligation. The promised goods or services in the Company's arrangements typically consist of a license to the Company's intellectual property and/or research and development services. The Company may provide options to additional items in such arrangements, which are accounted for as separate contracts when the customer elects to exercise such options, unless the option provides a material right to the customer. Performance obligations are promises in a contract to transfer a distinct good or service to the customer that (i) the customer can benefit from on its own or together with other readily available resources, and (ii) is separately identifiable from other promises in the contract. Goods or services that are not individually distinct performance obligations are combined with other promised goods or services until such combined group of promises meet the requirements of a performance obligation.

The Company determines the transaction price based on the amount of consideration the Company expects to receive for transferring the promised goods or services in the contract. Consideration may be fixed, variable, or a combination of both. At contract inception for arrangements that include variable consideration, the Company estimates the probability and extent of consideration it expects to receive under the contract utilizing either the most likely amount method or expected amount method, whichever best estimates the amount expected to be received. The Company then considers any constraints on the variable consideration and includes in the transaction price variable consideration to the extent it is deemed probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved.

The Company then allocates the transaction price to each performance obligation based on the relative standalone selling price and recognizes as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) control is transferred to the customer and the performance obligation is satisfied. For performance obligations which consist of licenses and other promises, the Company utilizes judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress. The Company evaluates the measure of progress each reporting period and, if necessary, adjusts the measure of performance and related revenue recognition.

The Company records amounts as accounts receivable when the right to consideration is deemed unconditional. When consideration is received, or such consideration is unconditionally due, from a customer prior to transferring goods or services to the customer under the terms of a contract, a contract liability is recorded for deferred revenue. As of December 31, 2021 and December 31, 2020, the Company had $0 and $1,186 of accounts receivable and $0 and $8,201 of unbilled accounts receivable, respectively.

The Company does not assess whether a contract has a significant financing component if the expectation at contract inception is that the period between payment by the customer and the transfer of the promised goods or services to the customer will be one year or less. Incremental costs of obtaining a contract are expensed as and when incurred if the expected period over which the Company would have amortized the asset is one year or less, or the amount is immaterial.

Collaboration Revenue

Arrangements with collaborators may include licenses to intellectual property, research and development services, manufacturing services for clinical and commercial supply, and participation on joint steering committees. The Company evaluates the promised goods or services to determine which promises, or group of promises, represent performance obligations. In contemplation of whether a promised good or service meets the criteria required of a performance obligation, the Company considers the stage of development of the underlying intellectual property, the capabilities and expertise of the customer relative to the underlying intellectual property, and whether the promised goods or services are integral to or dependent on other promises in the contract. When accounting for an arrangement that contains multiple performance obligations, the Company must develop judgmental assumptions, which may include market conditions, reimbursement rates for personnel costs, development timelines and probabilities of regulatory success to determine the stand-alone selling price for each performance obligation identified in the contract.

When the Company concludes that a contract should be accounted for as a combined performance obligation and recognized over-time, the Company must then determine the period over which revenue should be recognized and the method by which to measure revenue. The Company generally recognizes revenue using a cost-based input method.

Licenses of intellectual property

If a license to the Company's intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, the Company recognizes revenue allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license. For licenses that are bundled with other promises, the Company utilizes judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue associated with the bundled performance obligation. The Company evaluates the measure of progress each reporting period and, if necessary, adjusts the measure of progress and related revenue recognition.

Milestone Payments

At the inception of each arrangement that includes developmental and regulatory milestone payments, the Company evaluates whether the achievement of each milestone specifically relates to the Company's efforts to satisfy a performance obligation or transfer a distinct good or service within a performance obligation. If the achievement of a milestone is considered a direct result of the Company's efforts to satisfy a performance obligation or transfer a distinct good or service and the receipt of the payment is based upon the achievement of the milestone, the associated milestone value is allocated to that distinct good or service, otherwise it will be allocated to all performance obligations of the arrangement based on the initial allocation.

The Company evaluates each milestone to determine when and how much of the milestone to include in the transaction price. The Company first estimates the amount of the milestone payment that the Company could receive using either the expected value or the most likely amount approach. The Company primarily uses the most likely amount approach as that approach is generally most predictive for milestone payments with a binary outcome. Then, the Company considers whether any portion of that estimated amount is subject to the variable consideration constraint (that is, whether it is probable that a significant reversal of cumulative revenue would not occur upon resolution of the uncertainty). The Company updates the estimate of variable consideration included in the transaction price at each reporting date which includes updating the assessment of the likely amount of consideration and the application of the constraint to reflect current facts and circumstances.

Royalties

For arrangements that include sales-based royalties, including milestone payments based on the level of sales, and the license is deemed to be the predominant item to which the royalties relate, the Company will recognize revenue at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied). To date, the Company has not recognized any revenue related to sales-based royalties or milestone payments based on the level of sales.

Manufacturing supply services

For arrangements that include a promise of supply of clinical or commercial product, the Company determines if the supply is a promise in the contract or a future obligation at the customer's option. If determined to be a promise at inception of the contract, the Company evaluates the promise to determine whether it is a separate performance obligation or a component of a bundled performance obligation. If determined to be an option, the Company determines if the option provides a material right to the customer and if so,

accounts for the option as a separate performance obligation. If determined to be an option but not a material right, the Company accounts for the option as a separate contract when the customer elects to exercise the option.

Grant Revenue

The Company generates revenue from government contracts that reimburse the Company for certain allowable costs for funded projects. For contracts with government agencies, when the Company has concluded that it is the principal in conducting the research and development expenses, and where the funding arrangement is considered central to the Company's ongoing operations, the Company classifies the recognized funding received as revenue.

The Company has concluded to recognize funding received as revenue, rather than as a reduction of research and development expenses, because the Company is the principal in conducting the research and development activities and these contracts are central to its ongoing operations. Revenue is recognized as the qualifying expenses related to the contracts are incurred. Revenue recognized upon incurring qualifying expenses in advance of receipt of funding is recorded in the Company's consolidated balance sheet as accounts receivable. The related costs incurred by the Company are included in research and development expense in the Company's consolidated statements of operations and comprehensive loss.

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 taxes are determined based on the difference between the financial statement and tax basis of assets and liabilities using enacted tax rates in effect in the years 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.

The Company accounts for uncertainty in income taxes recognized in the 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 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.

Segment Data

The Company manages its operations as a single segment for the purposes of assessing performance and making operating decisions. The Company's singular focus is on developing microbiome therapeutics to treat the modulation of the colonic microbiome. Revenue to date has been generated solely through the Company's agreements with its collaborators, all of which has been earned in the United States. All tangible assets are held in the United States.

Comprehensive Loss

Comprehensive loss includes net loss as well as other changes in stockholders' equity (deficit) that result from transactions and economic events other than those with stockholders. For the years ended December 31, 2021, 2020 and 2019, other comprehensive income (loss) consisted of changes in unrealized gains (losses) from available-for-sale investments and a currency translation adjustment.

Net Loss per Share

Basic net loss per share is computed using the weighted average number of common shares outstanding during the period. Diluted net loss per share is computed using the sum of the weighted average number of common shares outstanding during the period and, if dilutive, the weighted average number of potential shares of common stock, including the assumed exercise of stock options and unvested restricted stock. The Company applies the two-class method to calculate its basic and diluted net loss per share attributable to

common stockholders. The two-class method is an earnings allocation formula that treats a participating security as having rights to earnings that otherwise would have been available to common stockholders. However, the two-class method does not impact the net loss per share of common stock as the Company was in a net loss position for each of the periods presented.

The Company's convertible preferred stock contractually entitle the holders of such shares to participate in dividends but do not contractually require the holders of such shares to participate in losses of the Company. Similarly, restricted stock awards entitle the holder of such awards to dividends declared or paid by the board of directors, regardless of whether such awards are unvested, as if such shares were outstanding common shares at the time of the dividend. However, the unvested restricted stock awards are not entitled to share in the residual net assets (deficit) of the Company. Accordingly, 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.

Leases

In accordance with ASC 842, Leases, the Company determines if an arrangement is or contains a lease at inception. A contract is or contains a lease if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration. The Company classifies leases at the lease commencement date as operating or finance leases and records a right-of-use asset and a lease liability on the consolidated balance sheet for all leases with an initial lease term of greater than 12 months. Leases with an initial term of 12 months or less are not recorded in the balance sheet, but payments are recognized as expense on a straight-line basis over the lease term. The Company has elected not to recognize leases with terms of 12 months or less.

A lease qualifies as a finance lease if any of the following criteria are met at the inception of the lease: (i) there is a transfer of ownership of the leased asset to the Company by the end of the lease term, (ii) the Company holds an option to purchase the leased asset that it is reasonably certain to exercise, (iii) the lease term is for a major part of the remaining economic life of the leased asset, (iv) the present value of the sum of lease payments equals or exceeds substantially all of the fair value of the leased asset, or (v) the nature of the leased asset is specialized to the point that it is expected to provide the lessor no alternative use at the end of the lease term.

The Company enters into contracts that contain both lease and non-lease components. Non-lease components may include maintenance, utilities, and other operating costs. The Company combines the lease and non-lease components of fixed costs in its lease arrangements as a single lease component. Variable costs, such as utilities or maintenance costs, are not included in the measurement of right-of-use assets and lease liabilities, but rather are expensed when the event determining the amount of variable consideration to be paid occurs.

Finance and operating lease assets and liabilities are recognized at the lease commencement date based on the present value of the lease payments over the lease term using the discount rate implicit in the lease. If the rate implicit is not readily determinable, the Company utilizes an estimate of its incremental borrowing rate based upon the available information at the lease commencement date. Operating lease assets are further adjusted for prepaid or accrued lease payments. Operating lease payments are expensed using the straight-line method as an operating expense over the lease term. The Company's lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option. Finance lease assets are amortized to depreciation expense using the straight-line method over the shorter of the useful life of the related asset or the lease term. Finance lease payments are bifurcated into (i) a portion that is recorded as imputed interest expense and (ii) a portion that reduces the finance liability associated with the lease.

Recently Adopted Accounting Pronouncements

In November 2018, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2018-18, *Collaborative Arrangements (Topic 808): Clarifying the Interaction between Topic 808 and Topic 606* ("ASU 2018-18"). This standard makes targeted improvements for collaborative arrangements as follows:

- Clarifies that certain transactions between collaborative arrangement participants should be accounted for as revenue under ASC 606, Revenue from Contracts with Customers, when the collaborative arrangement participant is a customer in the context of a unit of account. In those situations, all the guidance in ASC 606 should be applied, including recognition, measurement, presentation and disclosure requirements;
- Adds unit-of-account guidance to ASC 808, Collaborative Arrangements, to align with the guidance in ASC 606 (that is, a distinct good or service) when an entity is assessing whether the collaborative arrangement or a part of the arrangement is within the scope of ASC 606; and

- Precludes a company from presenting transactions with collaborative participants that are not directly related to sales to third parties with revenue recognized under ASC 606 if the collaborative arrangement participant is not a customer.

This standard became effective for the Company on January 1, 2020 and did not have a material impact on the Company's consolidated financial statements and related disclosures.

In August 2018, the FASB issued ASU No. 2018-13, *Disclosure Framework - Changes to the Disclosure Requirements for Fair Value Measurement* ("ASU 2018-13"). This standard modifies certain disclosure requirements on fair value measurements. This standard became effective for the Company on January 1, 2020 and did not have a material impact on the Company's disclosures.

Recently Issued Accounting Pronouncements

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments* ("ASU 2016-13"), which requires the measurement and recognition of expected credit losses for financial assets held at amortized cost. ASU 2016-13 replaces the existing incurred loss impairment model with an expected loss model. It also eliminates the concept of other-than-temporary impairment and requires credit losses related to available-for-sale debt securities to be recorded through an allowance for credit losses rather than as a reduction in the amortized cost basis of the securities. These changes may result in earlier recognition of credit losses. In November 2018, the FASB issued ASU No. 2018-19, *Codification Improvements to Topic 326, Financial Instruments—Credit Losses*, which narrowed the scope and changed the effective date for non-public entities for ASU 2016-13. The FASB subsequently issued supplemental guidance within ASU No. 2019-05, *Financial Instruments—Credit Losses (Topic 326): Targeted Transition Relief* ("ASU 2019-05"). ASU 2019-05 provides an option to irrevocably elect the fair value option for certain financial assets previously measured at amortized cost basis. For public entities that are Securities and Exchange Commission filers, excluding entities eligible to be smaller reporting companies, ASU 2016-13 is effective for annual periods beginning after December 15, 2019, including interim periods within those fiscal years. For all other entities, ASU 2016-13 is effective for annual periods beginning after December 15, 2022, including interim periods within those fiscal years. Early adoption is permitted. This standard will be effective for the Company on January 1, 2022. The Company is currently evaluating the potential impact that this standard may have on its consolidated financial statements and related disclosures.

3. Fair Value of Financial Assets and Liabilities

The following tables present the Company's fair value hierarchy for its assets and liabilities that are measured at fair value on a recurring basis (in thousands):

	Fair Value Measurements as of December 31, 2021 Using:			
	Level 1	Level 2	Level 3	Total
Cash Equivalents:				
Money market funds	$ 70,322	$ —	$ —	$ 70,322
Commercial paper	—	3,999	—	3,999
Investments:				
Commercial paper	$ —	$ 6,250	$ —	$ 6,250
Corporate bonds	—	40,095	—	40,095
Government securities	—	64,854	—	64,854
	$ 70,322	$ 115,198	$ —	$ 185,520

	Fair Value Measurements as of December 31, 2020 Using:			
	Level 1	Level 2	Level 3	Total
Cash Equivalents:				
Money market funds	$ 35,480	$ —	$ —	$ 35,480
Commercial paper	—	10,313	—	10,313
Corporate bonds	—	2,014	—	2,014
Investments:				
Commercial paper	$ —	$ 12,343	$ —	$ 12,343
Corporate bonds	—	68,289	—	$ 68,289
Certificate of deposits	—	2,272	—	$ 2,272
Government securities	—	104,488	—	104,488
	$ 35,480	$ 199,719	$ —	$ 235,199

Money market funds were valued by the Company based on quoted market prices, which represent a Level 1 measurement within the fair value hierarchy. Commercial paper, government securities, certificates of deposit and corporate bonds were valued by the Company using quoted prices in active markets for similar securities, which represent a Level 2 measurement within the fair value hierarchy. There were no transfers between Level 1 or Level 2 during the years ended December 31, 2021 and 2020.

As of December 31, 2021 and 2020 the Company held a restricted investment of $1,401 and $1,400, respectively, which represents a certificate of deposit that is classified as Level 2 in the fair value hierarchy.

4. Investments

Investments by security type consisted of the following at December 31, 2021 and December 31, 2020 (in thousands):

	December 31, 2021			
	Amortized Cost	Gross Unrealized Gain	Gross Unrealized Loss	Fair Value
Investments:				
Commercial paper	$ 6,250	$ —	$ —	$ 6,250
Corporate bonds	40,123	—	(28)	40,095
Government securities	64,885	—	(31)	64,854
	$ 111,258	$ —	$ (59)	$ 111,199

	December 31, 2020			
	Amortized Cost	Gross Unrealized Gain	Gross Unrealized Loss	Fair Value
Investments:				
Commercial paper	$ 12,343	$ —	$ —	$ 12,343
Corporate bonds	68,333	8	(52)	$ 68,289
Certificate of deposits	2,272	—	—	$ 2,272
Government securities	104,491	6	(9)	104,488
	$ 187,439	$ 14	$ (61)	$ 187,392

Investments with original maturities of less than 90 days are included in cash and cash equivalents on the consolidated balance sheets and are not included in the table above. Investments with maturities of less than twelve months are considered current assets and those investments with maturities greater than twelve months are considered non-current assets.

Excluded from the table above is a restricted investment of $1,400 as the cost approximates current fair value.

The amortized cost and fair value of investments in commercial paper, corporate bonds, certificates of deposit and government securities by contractual maturity, as of December 31, 2021 were as follows (in thousands):

	Available-for-Sale	
	Cost	Fair Value
Due in 1-year or less	$ 110,762	$ 110,704
Due after 1-year through 5-years	496	495
	$ 111,258	$ 111,199

The amortized cost and fair value of investments in commercial paper, corporate bonds, certificates of deposit and government securities by contractual maturity, as of December 31, 2020 were as follows (in thousands):

	Available-for-Sale	
	Cost	Fair Value
Due in 1-year or less	$ 137,588	$ 137,567
Due after 1-year through 5-years	49,851	49,825
	$ 187,439	$ 187,392

(amounts in thousands, except share and per share data)

5. Property and Equipment, Net

Property and equipment, net consisted of the following:

	December 31, 2021	December 31, 2020
Laboratory equipment	$ 19,137	$ 15,985
Computer equipment	3,255	2,874
Furniture and office equipment	1,219	1,033
Leasehold improvements	32,925	27,977
Construction in progress	1,670	348
	58,206	48,217
Less: Accumulated depreciation and amortization	(40,268)	(34,320)
	$ 17,938	$ 13,897

Depreciation and amortization expense was $5,947, $6,578 and $7,603 for the years ended December 31, 2021, 2020 and 2019, respectively.

6. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consisted of the following:

	December 31, 2021	December 31, 2020
Development and clinical manufacturing costs	$ 11,147	$ 6,339
Payroll and payroll-related costs	9,216	6,734
Liability related to 2021 License Agreement (Note 12)	21,098	—
Facility and other	3,633	1,153
	$ 45,094	$ 14,226

7. Leases

The Company leases real estate, primarily laboratory, office and manufacturing space. The Company's leases have remaining terms ranging from less than 1 year to 10 years. Certain leases include one or more options to renew, exercised at the Company's sole discretion, with renewal terms that can extend the lease from one year to five years. The Company evaluated the renewal options in its leases to determine if it was reasonably certain that the renewal option would be exercised, and therefore should be included in the calculation of the operating lease assets and operating lease liabilities. Given the Company's current business structure, uncertainty of future growth, and the associated impact to real estate, the Company concluded that it is not reasonably certain that any renewal options would be exercised. Therefore, the operating lease assets and operating lease liabilities only contemplate the initial lease terms. All the Company's leases qualify as operating leases.

In July 2019, the Company entered into a sublease agreement with a related party to sublease a portion of its office and laboratory space in Cambridge, Massachusetts. The term of the sublease agreement commenced in July 2019 and ends on the last day of the 24th calendar month following commencement, with no option to extend. The annual rent for the subleased premises will be approximately $1,200 in the first year and $1,300 in the second year, which is greater than the annual rent owed by the Company to the landlord for the leased premises. The sublessee is obligated to pay all real estate taxes and costs related to the subleased premises, including cost of operations, maintenance, repair, replacement and property management. The Company concluded that the sublease is an operating lease. Consistent with the Company's policy election for lessor operating leases, each lease component and its associated non-lease components is accounted for as a single lease component.

The following table summarizes the presentation in the Company's consolidated balance sheets of its operating leases:

	As of December 31, 2021	As of December 31, 2020
Assets:		
Operating lease assets	$ 18,208	$ 9,041
Liabilities:		
Operating lease liabilities	$ 6,610	$ 5,115
Operating lease liabilities, net of current portion	17,958	10,561
Total operating lease liabilities	$ 24,568	$ 15,676

The following table summarizes the effect of lease costs in the Company's consolidated statement of operations and comprehensive loss:

	Year Ended December 31,		
	2021	2020	2019
Operating lease costs	$ 5,170	$ 4,163	$ 4,532
Short-term lease costs	1,452	1,457	1,878
Variable lease costs	3,300	2,890	3,022
Sublease income	(1,575)	(1,813)	(890)
Total lease costs	$ 8,347	$ 6,697	$ 8,542

During the years ended December 31, 2021, 2020, and 2019, the Company made cash payments for operating leases of $6,821, $6,302 and $6,514, respectively.

As of December 31, 2021, future payments of operating lease liabilities are as follows (in thousands):

	As of December 31, 2021
2022	8,512
2023	7,480
2024	2,392
2025	2,466
2026 and thereafter	10,891
Total future payments of operating lease liabilities	$ 31,741
Less: imputed interest	(7,173)
Present value of operating lease liabilities	$ 24,568

As of December 31, 2021, the weighted average remaining lease term was 6.12 years and the weighted average incremental borrowing rate used to determine the operating lease liability was 10%. As of December 31, 2020, the weighted average remaining lease term was 2.89 years and the weighted average incremental borrowing rate used to determine the operating lease liability was 11%.

8. Restructuring

In February 2019, the Company implemented corporate changes to focus its resources on advancing its clinical-stage therapeutic candidates. In connection with the prioritization of these therapeutic candidates, the Company made changes to its management team and reduced headcount by approximately 30 percent.

During the year ended December 31, 2019 the Company recorded charges of $1,492, related to severance and other termination benefits. No restructuring charges were recorded during the years ended December 31, 2021 and 2020. During the year ended December 31, 2019 the Company paid $1,299 related to the restructuring and paid out the remaining $193 in 2020. There were no outstanding restructuring liabilities included in accrued expenses and other current liabilities as of December 31, 2021 and 2020.

(amounts in thousands, except share and per share data)

9. Notes Payable

On October 29, 2019 (the "Closing Date"), the Company entered into a Loan and Security Agreement (the "Loan Agreement") with Hercules Capital, Inc. ("Hercules") pursuant to which a term loan in an aggregate principal amount of up to $50,000 (the "Original Credit Facility") was available to the Company in three tranches, subject to certain terms and conditions. The first tranche of $25,000 was advanced to the Company on the Closing Date. The Company did not meet the milestone requirements for the second tranche under the Original Credit Facility, and as such, the additional amount up to $12,500 is not available for the Company to borrow. The Company elected not to borrow the third tranche of $12,500, which was available upon Hercules' approval until June 30, 2021. Advances under the Original Credit Facility will bear interest at a rate equal to the greater of either (i) the Prime Rate (as reported in The Wall Street Journal) plus 4.40%, and (ii) 9.65%. Following an interest-only period of 24 months, principal payments are due in 24 equal monthly installments commencing December 1, 2021 and ending November 1, 2023.

The Company may prepay advances under the Original Credit Facility, in whole or in part, at any time subject to a prepayment charge (the "Prepayment Premium") equal to: (a) 3.0 % of amounts so prepaid, if such prepayment occurs during the first year following the Closing Date; (b) 2.0% of the amount so prepaid, if such prepayment occurs during the second year following the Closing Date, and (c) 1.0% of the amount so prepaid, if such prepayment occurs after the second year following the Closing Date.

Upon prepayment or repayment of all or any of the term loans under the Original Credit Facility, the Company will pay (in addition to any Prepayment Premium) an end of term charge of 4.85% of the aggregate funded amount under the Original Credit Facility. With respect to the first tranche, an end of term charge of $1,213 will be payable upon any prepayment or repayment. To the extent that the Company is provided additional advances under the Original Credit Facility, the 4.85% end of term charge will be applied to any such additional amounts.

The Original Credit Facility is secured by substantially all of the Company's assets, other than the Company's intellectual property. The Company has agreed to not pledge or secure its intellectual property to others.

Upon issuance, the first tranche was recorded as a liability with an initial carrying value of $24,575, net of debt issuance costs. The initial carrying value will be accreted to the repayment amount, which includes the outstanding principal plus the end of term charge, through interest expense using the effective interest rate method over the term of the debt. The effective interest rate is 11.47%. As of December 31, 2021, the carrying value of the debt is $24,643.

In February 2022, prior to the issuance of the consolidated financial statements for the year ended December 31, 2021, the Company entered into a second amendment to the loan and security agreement with Hercules (the "Second Amendment"), which amended the Original Credit Facility to refinance its short-term obligation on a long-term basis. The interest rate, interest-only period and prepayments under the Original Credit Facility, as well as certain covenants, are subject to amendments made pursuant to the Second Amendment (Note 18). As a result of the Second Amendment, the carrying value of the note payable is classified as a long-term liability on the Company's consolidated balance sheet as of December 31, 2021.

The future principal payments due under the arrangement, excluding interest and the end of term charge, are as follows after taking into consideration the amendment to the Original Credit Facility that was entered into in February 2022:

Year Ending December 31,	Principal
2022	-
2023	-
2024	24,051
Total	$ 24,051

During the years ended December 31, 2021 and December 31, 2020, the Company recognized $2,910 and $2,899 of interest expense related to the Loan Agreement, respectively, which is reflected in interest expense on the consolidated statements of operations and comprehensive loss.

10. Convertible Preferred Stock

On July 1, 2015, in connection with the closing of the initial public offering of the Company's common stock ("IPO"), the Company effected its Restated Certificate of Incorporation, which authorizes the Company to issue 10,000,000 shares of preferred stock, $0.001 par value per share.

11. Stockholders' Equity Common Stock

On July 1, 2015, in connection with the closing of the IPO, the Company effected its Restated Certificate of Incorporation, which authorizes the Company to issue 200,000,000 shares of common stock, $0.001 par value per share.

On June 18, 2019, the Company completed an underwritten public offering, in which the Company sold 26,666,667 shares of its common stock at a price to the public of $2.25 per share. The aggregate net proceeds received by the Company from the offering were approximately $55,976, after deducting underwriting discounts and commissions and offering expenses payable by the Company. In addition, the Company granted the underwriters a 30-day option to purchase up to an additional 2,666,666 shares of common stock at the public offering price, less underwriting discounts and commissions.

On June 21, 2019, the Company sold an additional 2,151,911 shares of its common stock at a price to the public of $2.25 per share. The aggregate net proceeds received by the Company were approximately $4,551, after deducting underwriting discounts and commissions and offering expenses payable by the Company.

On November 27, 2019, the Company entered into a Sales Agreement (the "2019 Sales Agreement") with Cowen and Company, LLC ("Cowen") to sell shares of the Company's common stock, par value $0.001 per share (the "Common Stock"), with aggregate gross sales proceeds of up to $25,000, from time to time, through an "at the market" equity offering program under which Cowen will act as sales agent. On March 18, 2020, in connection with filing an updated registration statement on Form S-3 (File No. 333-237033), the Company entered into a Sales Agreement (the "2020 Sales Agreement"), with Cowen on substantially the same terms as the 2019 Sales Agreement and terminated the 2019 Sales Agreement. From January 1, 2020 to December 31, 2020 the Company sold 5,787,681 shares of common stock under the 2019 Sales Agreement and the 2020 Sales Agreement, as applicable, at an average price of approximately $4.40 per share, raising aggregate net proceeds of approximately $24,773 after deducting an aggregate commission of approximately 3%.

On August 12, 2020, the Company entered into an underwriting agreement (the "Underwriting Agreement") with Cowen and Company, LLC and Piper Sandler & Co., as representatives of the several underwriters named therein (collectively, the "Underwriters"), in connection with the issuance and sale by the Company in a public offering of 10,500,000 shares of the Company's common stock at a public offering price of $21.50 per share, less underwriting discounts and commissions, pursuant to an effective shelf registration statement on Form S-3 (Registration No. 333-244401) and a related prospectus supplement filed with the Securities and Exchange Commission (the "SEC" and such public offering, the "offering"). Under the terms of the Underwriting Agreement, the Company granted the Underwriters an option exercisable for 30 days to purchase up to an additional 1,575,000 shares of its common stock at the public offering price, less underwriting discounts and commissions, which the underwriters exercised in full. The Company received aggregate net proceeds from the offering of approximately $243,748 after deducting underwriting discounts and commissions and offering expenses payable by the Company.

Additionally on August 12, 2020, the Company entered into a Securities Purchase Agreement (the "Securities Agreement") with Nestlé for the sale by the Company of 959,002 shares of the Company's common stock at a purchase price of $20.855 per share (the "concurrent placement"). The Company received aggregate net proceeds from the concurrent placement of approximately $19,900 after deducting offering expenses payable by the Company. The consummation of the concurrent placement was contingent upon the closing of the offering and the satisfaction of certain other customary conditions. The shares were offered and sold to Nestlé pursuant to an effective registration statement on Form S-3 (File No. 333-237033) and a related prospectus supplement filed with the SEC.

2012 Stock Incentive Plan

The Company's 2012 Stock Incentive Plan, as amended, (the "2012 Plan") provided for the Company to sell or issue common stock or restricted common stock, or to grant incentive stock options or nonqualified stock options for the purchase of common stock, to employees, members of the board of directors and consultants of the Company. The 2012 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 their 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 the share of common stock on the date of grant and the term of stock option may not be greater than ten years. The Company generally granted stock-based awards with service conditions only ("service-based" awards).

Stock options granted under the 2012 Plan generally vest over four years and expire after ten years, although options have been granted with vesting terms less than four years. As of December 31, 2021, there were no shares available for future grant under the 2012 Plan.

(amounts in thousands, except share and per share data)

2015 Incentive Award Plan

On June 16, 2015, the Company's stockholders approved the 2015 Incentive Award Plan (the "2015 Plan"), which became effective on June 25, 2015. The 2015 Plan provides for the grant of incentive stock options, nonqualified stock options, stock appreciation rights, restricted stock awards, restricted stock units and other stock-based awards. The number of shares initially reserved for issuance under the 2015 Plan was the sum of (i) 2,200,000 shares of common stock and (ii) the number of shares subject to awards outstanding under the 2012 Plan that expire, terminate or are otherwise surrendered, cancelled, forfeited or repurchased by the Company on or after the effective date of the 2015 Plan. In addition, the number of shares of common stock that may be issued under the 2015 Plan is subject to increase on the first day of each calendar year, beginning in 2016 and ending in 2025, equal to the lesser of (i) 4% of the number of shares of the Company's common stock outstanding on the last day of the preceding applicable calendar year and (ii) an amount determined by the Company's board of directors.

Stock options granted under the 2015 Plan generally vest over four years and expire after ten years, although options have been granted with vesting terms less than four years. As of December 31, 2021, there were 2,138,525 shares available for future grant under the 2015 Plan.

2015 Employee Stock Purchase Plan

On June 16, 2015, the Company's stockholders approved the 2015 Employee Stock Purchase Plan (the "ESPP"), which became effective on June 25, 2015. A total of 365,000 shares of common stock were reserved for issuance under the ESPP. In addition, the number of shares of common stock that may be issued under the ESPP automatically increase on the first day of each calendar year, beginning in 2016 and ending in 2025, by an amount equal to the lesser of (i) 400,000 shares, (ii) 1% of the number of shares of the Company's common stock outstanding on the last day of the applicable preceding calendar year and (iii) an amount determined by the Company's board of directors. Offering periods under the ESPP will commence when determined by the plan administrator. As of December 31, 2021, there were 100,417 shares issued under the ESPP and 2,391,764 shares were reserved and available for issuance under the ESPP.

The ESPP provides that eligible employees may contribute up to 15% of their eligible earnings toward the semi-annual purchase of the Company's common stock. The ESPP is qualified under Section 423 of the Internal Revenue Code. The employee's purchase price is derived from a formula based on the closing price of the common stock on the first day of the offering period versus the closing price on the date of purchase (or, if not a trading day, on the immediately preceding trading day). The offering period under the ESPP has a duration of six months, and the purchase price with respect to each offering period beginning on or after such date is, until otherwise amended, equal to 85% of the lesser of (i) the fair market value of the Company's common stock at the commencement of the applicable six-month offering period or (ii) the fair market value of the Company's common stock on the purchase date. The Company estimates the fair value of common stock under the ESPP using a Black-Scholes valuation model. The fair value was estimated on the date of grant using the Black-Scholes option valuation model and the straight-line attribution approach with the following weighted-average assumptions: risk-free interest rate (1.2%); expected term (0.5 years); expected volatility (74.9%); and an expected dividend yield (0%). The Company recorded $530, $200 and $109 of stock-based compensation expense under the ESPP for the twelve months ended December 31, 2021, 2020 and 2019, respectively.

Stock Option Valuation

The assumptions that the Company used to determine the fair value of the stock options granted to employees and directors were as follows, presented on a weighted average basis:

	Year Ended December 31,		
	2021	2020	2019
Risk-free interest rate	0.73%	1.26%	2.64%
Expected term (in years)	5.4	6.0	6.0
Expected volatility	106.5%	73.3%	88.4%
Expected dividend yield	0%	0%	0%

(amounts in thousands, except share and per share data)

Stock Options

The following table summarizes the Company's stock option activity for the twelve months ended December 31, 2021:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value
Outstanding as of December 31, 2020	10,037,130	$ 9.54	7.87	$ 156,627
Granted	3,603,744	19.30		
Exercised	(329,112)	3.84		
Forfeited	(1,794,573)	12.19		
Outstanding as of December 31, 2021	11,517,189	$ 11.10	7.42	$ 28,006,768
Options exercisable as of December 31, 2021	5,590,163	$ 8.62	6.09	$ 16,670,723

The weighted average grant-date fair value of stock options granted during the years ended December 31, 2021, 2020 and 2019 was $15.33, $5.08, and $4.13 per share, respectively. The total intrinsic value of stock options exercised during the years ended December 31, 2021, 2020, and 2019 was $4,727, $37,255, and $244, respectively.

The aggregate intrinsic value of stock 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 stock options that had exercise prices lower than the fair value of the Company's common stock.

During the year ended December 31, 2019, the Company granted performance-based stock options to employees for the purchase of an aggregate of 1.1 million shares of common stock with a grant date fair value of $4.58 per share. These stock options are exercisable only upon achievement of specified performance targets. As of December 31, 2021, none of these options were exercisable because none of the specified performance targets had been achieved. Because achievement of the specified performance targets was not deemed probable as of December 31, 2021, the Company did not record any expense for these stock options from the dates of issuance through December 31, 2021.

During the three months ended March 31, 2021, the Company granted performance-based stock options to employees for the purchase of an aggregate of 440 thousand shares of common stock with a grant date fair value of $14.93 per share. These stock options are exercisable only upon achievement of specified performance targets. These options were ultimately forfeited as none of the performance targets were achieved. Because achievement of the specified performance targets was not deemed probable in any period, the Company did not record any expense for these stock options from the dates of issuance through December 31, 2021.

Additionally, during the year ended December 31, 2021, the Company granted performance-based stock options to employees for the purchase of an aggregate of 562 thousand shares of common stock with a grant date fair value of $5.53 per share. These stock options are exercisable only upon achievement of specified performance targets. As of December 31, 2021, none of these options were exercisable because none of the specified performance targets had been achieved. Because achievement of the specified performance targets was not deemed probable as of December 31, 2021, the Company did not record any expense for these stock options from the dates of issuance through December 31, 2021.

(amounts in thousands, except share and per share data)

Restricted Stock Units

The Company has granted restricted stock units with time-based vesting conditions. The table below summarizes the Company's restricted stock activity for the twelve months ended December 31, 2021:

	Number of Shares	Weighted Average Grant Date Fair Value
Unvested restricted stock units as of December 31, 2020	6,500	$ 25.36
Granted	768,998	$ 17.90
Forfeited	(40,093)	$ 23.15
Vested	(650)	$ 25.36
Unvested restricted stock units as of December 31, 2021	734,755	$ 17.68

The aggregate intrinsic value of restricted stock units that vested during the years ended December 31, 2021, 2020 and 2019 was $16, $532, and $517, respectively.

During the year ended December 31, 2021, the Company granted performance-based restricted stock awards to two employees for the purchase of an aggregate of 85 thousand shares of common stock with a grant date fair value of $9.59 per share and 40 thousand shares with a grant date fair value of $20.35 per share. These restricted stock awards vest only upon achievement of specified performance targets. As of December 31, 2021, none of these awards were vested because none of the specified performance targets had been achieved. Because achievement of the specified performance targets was not deemed probable as of December 31, 2021, the Company did not record any expense for these awards from the dates of issuance through December 31, 2021.

Stock-based Compensation

The Company recorded stock-based compensation expense related to stock options and restricted stock units in the following expense categories of its consolidated statements of operations and comprehensive loss:

	Year Ended December 31,		
	2021	2020	2019
Research and development expenses	$ 10,146	$ 4,760	$ 4,613
General and administrative expenses	10,076	4,064	3,731
	$ 20,222	$ 8,824	$ 8,344

As of December 31, 2021, the Company had an aggregate of $57,913 of unrecognized stock-based compensation cost, which is expected to be recognized over a weighted average period of 3.33 years.

12. Collaboration Revenue

License Agreement with NHSc Pharma Partners (Nestlé)

Summary of Agreement

In July 2021, the Company entered into a license agreement (the "2021 License Agreement") with Nestlé. Under the terms of the Agreement, the Company granted Nestlé a co-exclusive, sublicensable (under certain circumstances) license to develop, commercialize and conduct medical affairs activities for (i) therapeutic products based on the Company's microbiome technology (including the Company's SER-109 product candidate) that are developed by the Company or on the Company's behalf for the treatment of CDI and recurrent CDI, as well as any other indications pursued for the products upon mutual agreement of the parties (the "2021 Field") in the United States and Canada (the "2021 Licensed Territory"), and (ii) the Company's SER-109 product candidate and any improvements and modifications thereto developed pursuant to the terms of the 2021 License Agreement (the "2021 Collaboration Products") for any indications in the 2021 Licensed Territory. The Company is responsible for completing development of SER-109 in the 2021 Field in the United States until first regulatory approval for SER-109 is obtained.

Nestlé has the sole right to commercialize SER-109 in the 2021 Licensed Territory in accordance with a commercialization plan. Both parties will perform medical affairs activities in the 2021 Licensed Territory in accordance with a medical affairs plan. The Company will be responsible for the manufacturing and supply for commercialization under a supply agreement that will be entered

into between the parties. Both parties will perform pre-launch activities of SER-109 prior to the first commercial sale in the United States. The Company is responsible for funding the pre-launch activities until first commercial sale of SER-109 in the 2021 Licensed Territory and in accordance with a pre-launch plan, up to a specified cap. Following first commercial sale of SER-109, the Company will be entitled to an amount equal to 50% of the commercial profits.

In connection with the 2021 License Agreement, the Company received an upfront payment of $175,000. The Company is eligible to receive additional payments of up to $360,000 if certain regulatory and sales milestones are achieved. The potential future milestone payments include up to $135,000 for the achievement of specified regulatory milestones and up to $225,000 for the achievement of specified net sales milestones.

The 2021 License Agreement continues in effect until all development and commercialization activities for all 2021 Collaboration Products in the 2021 Licensed Territory have permanently ceased. The 2021 License Agreement may be terminated by either party upon sixty days' written notice for the other party's material breach that remains uncured during such sixty-day period, or immediately upon written notice for the other party's insolvency. Nestlé may also terminate the 2021 License Agreement at-will (i) with twelve months' prior written notice, effective only on or after the third anniversary of first commercial sale of the first 2021 Collaboration Product in the 2021 Licensed Territory, (ii) if first commercial sale of the first 2021 Collaboration Product in the 2021 Licensed Territory has not occurred by the fifth anniversary of the effective date of the 2021 License Agreement, with one hundred eighty days' prior written notice, which must be provided during a specified period set forth in the 2021 License Agreement, or (iii) if regulatory approval for SER-109 is not granted after submission by the Company of a filing seeking first regulatory approval as set forth in the development and regulatory activity plan, and the parties fail to agree on further development of SER-109 in accordance with the terms of the 2021 License Agreement, with one hundred eighty days' prior written notice, which must be provided within a specified period set forth in the 2021 License Agreement. The Company may also terminate the 2021 License Agreement immediately upon written notice if Nestlé challenges any licensed patent in the 2021 Licensed Territory. Upon termination of the 2021 License Agreement, all licenses granted to Nestlé by the Company will terminate. If the Company commits a material breach of the 2021 License Agreement, Nestlé may elect not to terminate the 2021 License Agreement but instead apply specified adjustments to the payment terms and other terms and conditions of the 2021 License Agreement.

Accounting Analysis

The 2021 License Agreement represents a separate contract between Nestlé and the Company. The 2021 License Agreement is within the scope of Accounting Standard Update 2018-18, Collaborative Arrangements (Topic 808), and has elements that are within the scope of Topic 606 and Topic 808.

The Company identified the following promises in the 2021 License Agreement that were evaluated under the scope of Topic 606: (i) delivery of a co-exclusive license for SER-109 to develop, commercialize and conduct medical affairs in the United States and Canada; (ii) services to be performed in accordance with the development and regulatory activity plan to obtain regulatory approval of SER-109 in the United States. The Company also evaluated whether certain options outlined within the 2021 License Agreement represented material rights that would give rise to a performance obligation and concluded that none of the options convey a material right to Nestlé and therefore are not considered separate performance obligations within the 2021 License Agreement.

The Company assessed the above promises and determined that the co-exclusive license for SER-109 and the services to obtain regulatory approval of SER-109 in the United States are reflective of a vendor-customer relationship and therefore represent performance obligations within the scope of Topic 606. The co-exclusive license for SER-109 in the United States and Canada is considered functional intellectual property and distinct from other promises under the contract as Nestlé can benefit from the license on its own or together with other readily available resources. The services performed by the Company to obtain regulatory approval of SER-109 are not complex or specialized, could be performed by another qualified third party, are not expected to significantly modify or customize the license given that SER-109 is late-stage intellectual property that has completed clinical development and the services are expected to be performed over a short period of time. Therefore, the license and the services each represents a separate performance obligation within a contract with a customer under the scope of Topic 606 at contract inception.

The Company considers the collaborative pre-launch activities and commercialization activities to be separate units of account within the scope of Topic 808 and are not deliverables under Topic 606. The Company and Nestlé are both active participants in the pre-launch activities and commercialization activities and are exposed to significant risks and rewards that are dependent on the commercial success of the activities in the arrangement.

The up-front payment of $175,000 compensated the Company for: (i) the co-exclusive license for SER-109 to develop, commercialize and conduct medical affairs in the United States and Canada, (ii) services performed in accordance with the development and regulatory activity plan to obtain regulatory approval of SER-109 in the United States and (iii) pre-launch activities performed by Nestlé and the Company until the first commercial sale of SER-109 in the United States. The commercialization activities, which include

the commercial manufacturing, participation on joint steering committees and medical affairs work, that occur after regulatory approval of SER-109 in the United States, are part of the 50/50 sharing of commercial profits. Therefore, the up-front payment of $175,000 does not compensate the Company for these activities.

The Company allocated the $175,000 between the Topic 606 unit of account and the Topic 808 unit of account by determining the standalone selling price (SSP) of each good or service. The selling price of each good or service was determined based on the Company's SSP with the objective of determining the price at which it would sell such an item if it were to be sold regularly on a standalone basis. The Company determined the transaction price under Topic 606 to be $139,500 and the Topic 808 amount to be $35,500 at the inception of the 2021 License Agreement.

The Company determined that any variable consideration related to regulatory milestones is deemed to be fully constrained and therefore excluded from the transaction price due to the high degree of uncertainty and risk associated with these potential payments, as the Company determined that it could not assert that it was probable that a significant reversal in the amount of cumulative revenue recognized will not occur. The Company also determined that sales milestones relate solely to the license of intellectual property and are therefore excluded from the transaction price under the sales- or usage-based royalty exception of Topic 606. Revenue related to these sales milestones will only be recognized when the associated sales occur, and relevant thresholds are met.

The Topic 606 transaction price of $139,500 has been allocated to the co-exclusive license for SER-109 and the services performed in accordance with the development and regulatory activity plan to obtain regulatory approval of SER-109 in the United States based on the Company's SSP. The Company recognizes revenue for the license performance obligation at a point in time, that is upon transfer of the license to Nestlé. As control of the license was transferred in July 2021, the Company recognized $131,343 of collaboration revenue - related party during the year ended December 31, 2021 pertaining to the license performance obligation and $2,068 relating to the services performance obligation.

The amount allocated to the Topic 808 unit of accounting relates to the pre-launch activities performed prior to the first commercial sale of SER-109 and was determined to be $35,500 based on standalone selling price.

The Company recorded the $35,500 in total liabilities on its consolidated balance sheet at the inception of the arrangement. On a quarterly basis, the Company and Nestlé will provide financial information about the pre-launch activities performed by both parties. The Company will reduce the $35,500 liability as the pre-launch activities are performed and it makes payments to Nestlé for the pre-launch costs Nestlé incurs. As of December 31, 2021, there is $21,098 included in accrued expenses and other current liabilities and $10,585 included in other long-term liabilities.

The cost associated with pre-launch activities performed by the Company will be recorded within total operating expenses in the Company's consolidated statements of operations and comprehensive loss. In the year ended December 31, 2021, the Company recognized $2,168 in research and development expenses and $3,383 in general and administrative expenses associated with pre-launch activities performed.

As the Company and Nestlé are both active participants in the pre-launch activities, the sharing of 50% of the pre-launch costs will be recognized in collaboration (profit) loss sharing - related party in the Company's consolidated statements of operations and comprehensive loss. The Company recorded $1,732 of income in the collaboration (profit) loss sharing line for the year ended December 31, 2021.

Collaboration and License Agreement with Société des Produits Nestlé S.A. (Nestlé)

Summary of Agreement

In January 2016, the Company entered into a collaboration and license agreement with Nestlé (the "2016 License Agreement") for the development and commercialization of certain product candidates in development for the treatment and management of CDI and IBD, including UC and Crohn's disease. The 2016 License Agreement supports the development of the Company's portfolio of products for CDI and IBD in markets outside of the United States and Canada (the "2016 Licensed Territory"). The Company has retained full commercial rights to its entire portfolio of product candidates with respect to the United States and Canada.

Under the 2016 License Agreement, the Company granted to Nestlé an exclusive, royalty-bearing license to develop and commercialize, in the 2016 Licensed Territory, certain products based on its microbiome technology that are being developed for the treatment of CDI and IBD, including SER-109, SER-262, SER-287 and SER-301 (collectively, the "2016 Collaboration Products"). The 2016 License Agreement sets forth the Company's and Nestlé's respective obligations for development, commercialization, regulatory and manufacturing and supply activities for the 2016 Collaboration Products with respect to the licensed fields and the 2016 Licensed Territory.

Under the 2016 License Agreement, Nestlé agreed to pay the Company an upfront cash payment of $120,000, which the Company received in February 2016. The Company is eligible to receive up to $285,000 in development milestone payments, $375,000 in regulatory payments and up to an aggregate of $1,125,000 for the achievement of certain commercial milestones related to the sales of 2016 Collaboration Products. Nestlé also agreed to pay the Company tiered royalties, at percentages ranging from the high single digits to high teens, of net sales of 2016 Collaboration Products in the 2016 Licensed Territory.

Under the 2016 License Agreement, the Company was entitled to receive a $20,000 milestone payment from Nestlé following initiation of a SER-287 Phase 2 study and a $20,000 milestone payment from Nestlé following the initiation of a SER-287 Phase 3 study. In November 2018, the Company entered into a letter agreement with Nestlé which modified the 2016 License Agreement to address the current clinical plans for SER-287. Pursuant to the letter agreement, the Company and Nestlé agreed that following initiation of the SER-287 Phase 2b study, the Company would be entitled to receive $40,000 in milestone payments from Nestlé, which represents the milestone due to the Company for the initiation of a SER-287 Phase 2 study and a Phase 3 study. The SER-287 Phase 2b study was initiated and the $40,000 of milestone payments were received in December 2018. The letter agreement also provides scenarios under which Nestlé's reimbursement to the Company for certain Phase 3 development costs would be reduced or delayed depending on the outcomes of the SER-287 Phase 2b study.

The 2016 License Agreement continues in effect until terminated by either party on the following bases: (i) Nestlé may terminate the 2016 License Agreement in the event of serious safety issues related to any of the 2016 Collaboration Products; (ii) the Company may terminate the 2016 License Agreement if Nestlé challenges the validity or enforceability of any of the Company's licensed patents; and (iii) either party may terminate the 2016 License Agreement in the event of the other party's uncured material breach or insolvency. Upon termination of the 2016 License Agreement, all licenses granted to Nestlé by the Company will terminate, and all rights in and to the 2016 Collaboration Products in the 2016 Licensed Territory will revert to the Company. If the Company commits a material breach of the 2016 License Agreement, Nestlé may elect not to terminate the 2016 License Agreement but instead apply specified adjustments to its payment obligations and other terms and conditions of the 2016 License Agreement.

Accounting Analysis

The Company assessed the 2016 License Agreement in accordance with ASC 606 and concluded that Nestlé is a customer. The Company identified the following promises under the contract: (i) a license to develop and commercialize the 2016 Collaboration Products in the 2016 Licensed Territory, (ii) obligation to perform research and development services, (iii) participation on a joint steering committee, and (iv) manufacturing services to provide clinical supply to complete future clinical trials. In addition, the Company identified a contingent obligation to perform manufacturing services to provide commercial supply if commercialization occurs, which is contingent upon regulatory approval. This contingent obligation is not a performance obligation at inception and has been excluded from the initial allocation as it represents a separate buying decision at market rates, rather than a material right in the contract. The Company assessed the promised goods and services to determine if they are distinct. Based on this assessment, the Company determined that Nestlé cannot benefit from the promised goods and services separately from the others as they are highly interrelated and therefore not distinct. Accordingly, the promised goods and services represent one combined performance obligation and the entire transaction price will be allocated to that single combined performance obligation.

At contract inception, the Company determined that the $120,000 non-refundable upfront amount constituted the entirety of the consideration to be included in the transaction price as the development, regulatory, and commercial milestones were fully constrained. During the year ended December 31, 2016, the Company received $10,000 from Nestlé in connection with the initiation of the Phase 1b study for SER-262 in CDI. During the year ended December 31, 2017, the Company received $20,000 from Nestlé in connection with the initiation of the Phase 3 study for SER-109. During the year ended December 31, 2018, the Company received $40,000 from Nestlé in connection with the initiation of the Phase 2b study for SER-287. During the year ended December 31, 2020, the Company received $10,000 from Nestlé in connection with the initiation of the Phase 1b SER-301 study. As of December 31, 2021, the aggregate amount of the transaction price allocated to the performance obligation of the 2016 License Agreement was approximately $200,000.

During the years ended December 31, 2021, 2020, and 2019 using the cost-to-cost method, which best depicts the transfer of control to the customer, the Company recognized $10,446, $11,897, and $27,188 of Collaboration revenue – related party, respectively, relating to the 2016 License Agreement.

As of December 31, 2021 and December 31, 2020, there was $103,817, and $108,174 of deferred revenue related to the unsatisfied portion of the performance obligation under the Nestlé agreements. As of December 31, 2021, deferred revenue is classified as current or non-current in the consolidated balance sheets based on the Company's estimate of revenue that will be recognized within the next twelve months, which is determined by the cost-to-cost method which measures the extent of progress towards completion based on the

ratio of actual costs incurred to the total estimated costs expected upon satisfying the performance obligation. All costs associated with the 2016 License Agreement are recorded in research and development expense in the consolidated statements of operations and comprehensive loss.

AstraZeneca Research Collaboration and Option Agreement

Summary of the Agreement

In March 2019, the Company entered into a Research Collaboration and Option Agreement (the "Research Agreement") with MedImmune, LLC, a wholly owned subsidiary of AstraZeneca Inc. ("AstraZeneca"), to advance the mechanistic understanding of the microbiome in augmenting the efficacy of cancer immunotherapy. Under the Research Agreement, the Company and AstraZeneca will conduct certain research and development activities as set forth on a research plan focused on the role of the microbiome in certain cancers and cancer immunotherapies, including furthering the research program for SER-401, in combination with AstraZeneca compounds targeting various cancers.

Pursuant to the Research Agreement, the Company agreed not to conduct research or development on any microbiome products specifically designed by the Company during the term of the Research Agreement for the treatment of cancer ("Microbiome Oncology Products"), with or on behalf of any third-party without the prior approval of the joint steering committee for the Research Agreement for at least three years after the effective date (the "Exclusivity Period"). Additionally, AstraZeneca will pay to the Company a total of $20,000 in three equal installments, the first of which the Company received in April 2019, the second of which the Company received in December 2019, and the third of which the Company received in January 2021. Such payments are payable even if the Research Agreement is terminated in accordance with its terms, unless the Research Agreement is terminated by AstraZeneca for the Company's uncured material breach. Additionally, AstraZeneca will bear its costs of conducting activities under the research plan and will reimburse the Company for all activities performed under the research plan based on actual full-time employee ("FTE") time and certain third-party costs incurred by the Company in connection therewith.

Under the Research Agreement, the Company granted to AstraZeneca an exclusive option to negotiate a worldwide, sublicensable exclusive license under relevant intellectual property rights controlled by the Company to exploit Microbiome Oncology Products for the treatment of cancer. Additionally, the Company granted to AstraZeneca an additional exclusive option to obtain a worldwide, sublicensable, license under certain intellectual property rights arising out of the Agreement or coming into the control of the Company during the term of the Agreement, to exploit AstraZeneca's oncology and other assets which are the subject of the research plan. AstraZeneca may exercise each option at any point prior to 90 days after the end of the Exclusivity Period (the "Option Exercise Period") by delivering an option exercise notice to the Company. If AstraZeneca exercises an option during the Option Exercise Period, the parties will enter into exclusive, good faith negotiations for a period of six months (the "Negotiation Period") regarding the terms of the definitive license agreement contemplated by such option. If no definitive agreement is reached during the Negotiation Period, subject to certain other terms and conditions applicable for a one (1) year period, the Company is free to license, further develop or otherwise exploit its assets that were the subject of the option without further obligation to AstraZeneca.

The term of the Research Agreement continues in effect until the Research Agreement is terminated by the parties in accordance with its terms by mutual written agreement. Either party may terminate the Research Agreement for the other party's uncured material breach or bankruptcy or insolvency-related events. AstraZeneca may terminate the Research Agreement for convenience. In December 2020, the Company received written notice from AstraZeneca that AstraZeneca elected to terminate the Research Agreement by and in accordance with its terms. The termination of the Research Agreement was effective on April 2, 2021 (the "Termination Date"), which was 120 days from the date of the termination notice.

Accounting Analysis

The Company assessed the Research Agreement in accordance with ASC 606 and concluded that AstraZeneca is a customer. The Company identified the following promises under the contract: (i) a research license, (ii) an obligation to perform research and development services, and (iii) participation on a joint steering committee. The Company assessed the promised goods and services to determine if they are distinct. Based on this assessment, the Company determined that AstraZeneca cannot benefit from the promised goods and services separately from the others as they are highly interrelated and therefore not distinct. Accordingly, the promised goods and services represent one combined performance obligation and the entire transaction price will be allocated to that single combined performance obligation.

(amounts in thousands, except share and per share data)

Each exclusive option granted to AstraZeneca provides AstraZeneca with the right to negotiate a license agreement in the future at fair value. Therefore, the Company concluded that each option does not constitute a performance obligation at inception and has been excluded from the initial allocation since each option represents a separate buying decision at market rates, rather than a material right in the contract.

At contract inception, the Company determined that the transaction price is comprised of: (i) the $20,000 fee, which represents fixed consideration, and (ii) the estimated reimbursement of research and development costs incurred, which represents variable consideration. The Company included the estimated reimbursement of research and development costs, approximately $13,900, in the transaction price at the inception of the arrangement because the Company is required to perform research and development services and the contract requires AstraZeneca to reimburse the Company for costs incurred. Also, since the related revenue would be recognized only as the costs are incurred, and the contract precludes the joint steering committee from changing the research plan without mutual agreement, the Company determined it is not probable that a significant reversal of cumulative revenue would occur.

The Company determined that revenue under the Research Agreement should be recognized over time as AstraZeneca simultaneously receives the benefit from the Company as the Company performs under the single performance obligation over time. The Company will recognize revenue for the single performance obligation using a cost-to-cost input method as the Company has concluded it best depicts the research and joint steering committee participation services performed prior to AstraZeneca's ability to negotiate a license. Under this method, the transaction price is recognized over the contract's entire performance period, using costs incurred relative to total estimated costs to determine the extent of progress towards completion.

In December 2020, the Company received written notice that AstraZeneca elected to terminate the Research Agreement. As a result of AstraZeneca's decision to terminate the Research Agreement, the Company's performance obligations under the Research Agreement have ended as of December 31, 2020. The final transaction price of $23,377 is comprised of the $20,000 fixed consideration and $3,376 for the reimbursed research and development costs. The Company removed all costs associated with its remaining performance from the cost-to-cost model in the fourth quarter of 2020. This resulted in the Company recognizing the remaining deferred revenue of $15,145 to collaboration revenue in the year ended December 31, 2020. No collaboration revenue was recognized for the year ended December 31, 2021, as the Company's performance obligations under the Research Agreement ended December 31, 2020.

Contract Balances from Contracts with Customers

The following tables present changes in the Company's contract liabilities during the year ended December 31, 2021 and 2020:

	Balance as of December 31, 2020	Additions	Deductions	Balance as of December 31, 2021
Year ended December 31, 2021				
Contract liabilities:				
Deferred revenue - related party	$ 108,174	8,157	(12,514)	$ 103,817

	Balance as of December 31, 2019	Additions	Deductions	Balance as of December 31, 2020
Year ended December 31, 2020				
Contract liabilities:				
Deferred revenue - related party	$ 110,071	10,000	(11,897)	$ 108,174
Deferred revenue	$ 9,668	7,493	(17,161)	$ -

During the year ended December 31, 2021, the Company recognized the following revenues as a result of changes in the contract liability balances in the respective periods:

	Year Ended December 31,	
	2021	2020
Revenue recognized in the period from:		
Amounts included in the contract liability at the beginning of the period	$ 10,446	$ 21,565

(amounts in thousands, except share and per share data)

When consideration is received, or such consideration is unconditionally due, from a customer prior to transferring goods or services to the customer under the terms of a contract, a contract liability is recorded. Revenue is recognized from the contract liability over time using the cost-to-cost method.

13. Net Loss per Share

Basic and diluted net loss per share attributable to common stockholders was calculated as follows:

	Year Ended December 31,		
	2021	2020	2019
Numerator:			
Net loss attributable to common stockholders	$ (65,578)	$ (89,127)	$ (70,279)
Denominator:			
Weighted average common shares outstanding, basic and diluted	91,702,866	79,789,220	56,649,220
Net loss per share attributable to common stockholders, basic and diluted	$ (0.72)	$ (1.12)	$ (1.24)

The Company's potential dilutive securities, which include stock options, unvested restricted common stock and shares issuable under the ESPP, 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 following potential common shares, presented based on amounts outstanding at each period end, were excluded from the calculation 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,		
	2021	2020	2019
Stock options to purchase common stock	11,517,189	10,037,130	8,310,683
Unvested restricted stock units	734,755	6,500	130,000
Shares issuable under employee stock purchase plan	165,047	10,786	89,821
	12,416,991	10,054,416	8,530,504

14. Commitments and Contingencies

Leases

Refer to Note 7 "Leases" for discussion of the commitments associated with the Company's lease portfolio.

Indemnification Agreements

In the ordinary course of business, the Company may provide indemnification of varying scope and terms to 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 its 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 does not believe that the outcome of any claims under indemnification arrangements will have a material effect on its financial position, results of operations or cash flows, and it has not accrued any liabilities related to such obligations in its consolidated financial statements as of December 31, 2021 or 2020.

Legal Contingencies

The Company accrues a liability for legal contingencies when it believes that it is both probable that a liability has been incurred and that the Company can reasonably estimate the amount of the loss. The Company reviews these accruals and adjusts them to reflect ongoing negotiations, settlements, rulings, advice of legal counsel and other relevant information. To the extent new information is obtained and the views on the probable outcomes of claims, suits, assessments, investigations or legal proceedings change, changes in the Company's accrued liabilities would be recorded in the period in which such determination is made.

In addition, in accordance with the relevant authoritative guidance, for any matters in which the likelihood of material loss is at least reasonably possible, the Company will provide disclosure of the possible loss or range of loss. If a reasonable estimate cannot be made, however, the Company will provide disclosure to that effect. The Company expenses legal costs as they are incurred.

The Company did not accrue any liabilities related to legal contingencies in its consolidated financial statements as of December 31, 2021 and December 31, 2020.

Bacthera Long Term Manufacturing Agreement

On November 8, 2021, the Company entered into a Long Term Manufacturing Agreement (the "Bacthera Agreement") with BacThera AG ("Bacthera"), a joint venture between Chr. Hansen and a Lonza Group affiliate. The Bacthera Agreement governs the general terms under which Bacthera, or one of its affiliates, will (i) construct a dedicated full-scale production suite for the Company at Bacthera's Microbiome Center of Excellence in Visp, Switzerland, which is currently under construction; and (ii) provide manufacturing services to the Company for its SER-109 product and, if agreed by the parties, SER-287 product.

Under the terms of the Bacthera Agreement, the Company has agreed to pay Bacthera a total of at least 240,000 CHF (or approximately $262,000) for the initial term of the agreement, inclusive of the construction fees and annual operating fees. Bacthera is funding the majority of the construction costs and will own and control the manufacturing suite during construction. The construction fees that the Company is responsible for represent a small percentage of the overall construction costs and are payable upon the achievement of certain milestones related to the construction of the dedicated manufacturing suite. The annual operating fee includes the cost of a baseline annual batch production volume. The Company has also agreed to pay certain other ancillary fees and a per-batch fee in excess of the baseline batches. These fees are subject to adjustment during construction for certain items outside of Bacthera's control and annually against an agreed index. The Company will supply the active pharmaceutical ingredients to Bacthera to enable it to perform the services and pay for certain other raw materials and manufacturing components, which will be acquired by Bacthera.

The Bacthera Agreement has an initial term that continues until the tenth anniversary of the earlier of (a) successful completion of construction and demonstration of Bacthera's readiness for commercial production or (b) the commencement of manufacturing.

The initial term is subject to renewals, which could extend the term to 16 years, and additional three-year terms thereafter. Each party has the ability to terminate the Bacthera Agreement upon the occurrence of certain customary conditions. The Company may also terminate the Bacthera Agreement for convenience after a defined period. In the event of a termination, the Company has certain financial obligations that would apply, and Bacthera has agreed to grant a license to Bacthera-developed manufacturing know how, if any, and provide technical assistance to the Company, so that the Company could transfer the manufacturing operations to itself or a third party. The Bacthera Agreement also contains representations, warranties and indemnity obligations as well as limitations of liability that are customary for agreements of this type.

The Bacthera Agreement represents a lease as the Company will have the right to use the dedicated manufacturing suite for a period of time following completion of the construction of the manufacturing suite and approval by regulatory authorities. As of December 31, 2021, the lease commencement date has not occurred and therefore the Company has not recorded an operating lease asset or an operating lease liability on its consolidated balance sheet.

15. Income Taxes

During the years ended December 31, 2021, 2020 and 2019, the Company recorded no income tax benefits for the net operating losses incurred in each year or interim period, due to its uncertainty of realizing a benefit from those items.

(amounts in thousands, except share and per share data)

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,		
	2021	2020	2019
Federal statutory income tax rate	(21.0)%	(21.0)%	(21.0)%
Research and development tax credits	(16.6)	(6.4)	(5.8)
State taxes, net of federal benefit	(2.8)	(7.8)	(6.8)
Stock-based compensation	(0.4)	(5.8)	(1.7)
Other	0.4	0.2	(0.7)
Change in deferred tax asset valuation allowance	40.4	40.8	36.0
Effective income tax rate	—%	—%	—%

Net deferred tax assets as of December 31, 2021 and 2020 consisted of the following:

	December 31,	
	2021	2020
Deferred tax assets:		
Net operating loss carryforwards	$ 108,189	$ 106,351
Research and development tax credit carryforwards	53,133	42,311
Capitalized organization costs	181	214
Stock-based compensation expense	16,045	11,615
Lease Liability	6,635	4,283
Charitable Contributions	50	15
Deferred Revenue	36,666	29,553
Accrued expenses	2,475	1,783
Capitalized research and development expenses	43	51
Section 163(j) limitation	1,368	540
Depreciation and amortization	247	—
Total deferred tax assets	$ 225,032	$ 196,716
Deferred tax liabilities:		
Depreciation and amortization	—	(510)
Right of use assets	(4,918)	(2,470)
Total deferred tax liabilities	(4,918)	(2,980)
Valuation allowance	$ (220,114)	$ (193,736)
Net deferred tax assets	$ —	$ —

As of December 31, 2021, the Company had net operating loss carryforwards ("NOLs") for federal and state income tax purposes of $402,500 and $394,100, respectively. Federal NOLs of $119,800, generated before 2018, will begin expiring in varying amounts in 2035 unless utilized. The remaining federal NOLs of $282,700, generated after 2017, will be carried forward indefinitely and could be used to offset up to 80% of taxable income in future tax years. Massachusetts does not follow federal time periods for NOLs and as such the Company's Massachusetts NOLs of $394,100 will expire at various times starting in 2035. As of December 31, 2021, the Company also had available research and development tax credit carryforwards for federal and state income tax purposes of $43,700 and $11,900, respectively, which begin to expire in 2031 and 2028, respectively. The federal research and development tax credits include an orphan drug credit carryforward of $23,700.

Utilization of the NOLs 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 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. In general, an ownership change, as defined by Section 382, results from transactions increasing the ownership of certain shareholders or public groups in the stock of a corporation by more than 50% over a three-year period. Since its formation, the Company has raised capital through the issuance of capital stock on several occasions. These financings, combined with the purchasing shareholders' subsequent disposition of those shares, may have resulted in a change of control or could result in a change of control in the future upon subsequent disposition. The Company conducted an analysis to determine if historical changes in ownership through December 31, 2020 would limit or otherwise restrict its ability to utilize these NOLs and research and development credit carryforwards. As a result of this analysis, the Company does not believe there are any significant limitations on its ability to utilize these carryforwards.

(amounts in thousands, except share and per share data)

However, future changes in ownership after December 31, 2020 could affect the limitation in future years. Any limitation may result in expiration of a portion of the NOLs or research and development credit carryforwards before utilization.

The Company has evaluated the positive and negative evidence bearing upon its ability to realize the deferred tax assets. Management has considered the Company's history of cumulative net losses incurred since inception and its lack of commercialization of any products or generation of any revenue from product sales 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 deferred tax assets as of December 31, 2021 and 2020. Management reevaluates the positive and negative evidence at each reporting period.

Changes in the valuation allowance for deferred tax assets during the years ended December 31, 2021, 2020 and 2019 related primarily to the increases in NOLs, research and development tax credit carryforwards, and stock-based compensation were as follows:

	Year Ended December 31,		
	2021	2020	2019
Valuation allowance at beginning of year	$ (193,736)	$ (157,346)	$ (132,009)
Decreases recorded as benefit to income tax provision	—	—	—
Increases recorded to income tax provision	(26,378)	(36,390)	(25,337)
Valuation allowance as of end of year	$ (220,114)	$ (193,736)	$ (157,346)

The Company had no unrecognized tax benefits or related interest and penalties accrued for the years ended December 31, 2021 and 2020. The Company will recognize interest and penalties related to uncertain tax positions in income tax expense.

The Company files 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. The Company is currently under examination by the Internal Revenue Service ("IRS") for the period ended December 31, 2018 related to its R&D tax credits. The Company's tax years are still open under statute from 2011 to present. All years may be examined to the extent the tax credit or net operating loss carryforwards are used in future periods.

16. Related Party Transactions

As described in Note 12, in July 2021, the Company entered into the 2021 License Agreement with NHSc Pharma Partners (together with Société des Produits Nestlé S.A., "Nestlé"). NHSc Pharma Partners is an affiliate of two of the Company's significant stockholders, Société des Produits Nestlé S.A. and Nestlé Health Science U.S. Holdings, Inc. During the year ended December 31, 2021, the Company recognized $133,411 of related party revenue associated with the 2021 License Agreement. As of the year ended December 31, 2021, there was $6,089 of deferred revenue related to the 2021 License Agreement, which is classified as current or non-current in the consolidated balance sheets. As of December 31, 2021 there was $21,098 included in accrued expenses and other liabilities and $10,585 included in other long term liabilities related to the 2021 License Agreement. The Company has made no payments to Nestlé during the year ended December 31, 2021. There was no amount due from Nestlé as of December 31, 2021.

As described in Note 12, in January 2016, the Company entered into the 2016 License Agreement with Société des Produits Nestlé S.A. (successor in interest to Nestec, Ltd.) for the development and commercialization of certain product candidates in development for the treatment and management of CDI and IBD, including UC and Crohn's disease. Société des Produits Nestlé S.A. and its affiliate Nestlé Health Science U.S. Holdings, Inc. are two of the Company's significant stockholders. During the years ended December 31, 2021, 2020, and 2019, the Company recognized $10,446, $11,897, and $27,188, respectively, of related party revenue associated with the 2016 License Agreement. As of December 31, 2021 and 2020, there was $97,728 and $108,174, respectively, of deferred revenue related to the 2016 License Agreement, which is classified as current or non-current in the consolidated balance sheets. The Company has made no payments to Nestlé during the year ended December 31, 2021. There was no amount due from Nestlé as of December 31, 2021.

In July 2019, the Company entered into a sublease agreement with Flagship Pioneering, one of the Company's significant stockholders, to sublease a portion of its office and laboratory space in Cambridge, Massachusetts. The term of the sublease agreement commenced in July 2019 and ends on the last day of the 24th calendar month following commencement, with no option to extend (see Note 7). Under this agreement, the Company recorded other income of $1,575 and $1,813 during the year ended December 31, 2021 and 2020. The Company received cash payments of $1,575 and $1,813 during the year ended December 31, 2021 and 2020.

17. 401(k) Savings Plan

The Company has a defined contribution savings plan under Section 401(k) of the Internal Revenue Code. This plan covers substantially 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. Effective January 1, 2016, the Company elected to match 50% of the first 6% of an employee's deferral. Company contributions are expensed in the year for which they are declared. During the years ended December 31, 2021, 2020, and 2019 the Company recorded expense of $1,087, $586, and $542, respectively, for 401(k) match contributions.

18. Subsequent Events

Second Amendment to Loan and Security Agreement with Hercules

Effective as of February 24, 2022 (the "Effective Date"), the Company entered into a Second Amendment to Loan and Security Agreement (the "Second Amendment"), with the lenders party thereto (the "Lenders"), and Hercules Capital, Inc., in its capacity as the administrative agent and the collateral agent for the Lenders, which amended the Original Credit Facility. Under the Original Credit Facility, term loans in an aggregate principal amount of up to $50,000 were available to the Company, of which $25,000 (the "first tranche") has been advanced to the Company and approximately $22,100 were outstanding immediately prior to the Effective Date. Pursuant to the Second Amendment, term loans in an aggregate principal amount of up to $100,000 (the "New Credit Facility") have become available to the Company in five tranches including the first tranche, subject to certain terms and conditions.

The first tranche in an aggregate principal amount of $25,000 is outstanding as of the Effective Date, after taking into account reborrowing by the Company on the Effective Date of a previously-repaid principal amount of approximately $2,900. The second tranche in an aggregate principal amount of $12,500 and the third tranche in an aggregate principal amount of $12,500 have been advanced to the Company and are outstanding as of the Effective Date. The fourth tranche in an aggregate principal amount of $25,000 is available upon satisfaction of certain conditions, including the approval by the U.S. Food and Drug Administration of a biologics license application in respect of SER-109 (the "Regulatory Approval Milestone") by no later than December 15, 2023. The fifth tranche in an aggregate principal amount of up to $25,000 is available through the Amortization Date (as defined below) upon satisfaction of certain conditions, including the Lenders' investment committee approval.

All advances outstanding under the New Credit Facility will bear interest at a rate equal to the greater of either (i) the Prime Rate (as reported in The Wall Street Journal) plus 6.40%, and (ii) 9.65%. For all advances outstanding under the New Credit Facility, the Company will make interest only payments through December 31, 2023, extendable to December 31, 2024 upon satisfaction of certain conditions (such applicable date, the "Amortization Date"). The principal balance and interest of the advances will be repaid in equal monthly installments after the Amortization Date and continuing through October 1, 2024, extendable to October 1, 2025, upon satisfaction of certain conditions (such applicable date, the "Maturity Date").

The Company may prepay advances under the New Credit Facility, in whole or in part, at any time subject to a prepayment charge equal to: (a) 2.0% of amounts so prepaid, if such prepayment occurs during the first year following the Effective Date; (b) 1.5% of the amount so prepaid, if such prepayment occurs during the second year following the Effective Date, and (c) 1.0% of the amount so prepaid, if such prepayment occurs during the third year following the Effective Date.

The Company will pay an end of term charge of 4.85% of the aggregate amount of the advances made under the Old Credit Facility on the earliest date of (i) November 1, 2023; (ii) the date that the Company prepays all of the outstanding principal in full, or (iii) the date the loan payments are accelerated due to an event of default. The Company will pay an additional end of term charge of 1.75% of the aggregate amount of the advances under the New Credit Facility (including the first tranche of $25,000) on the earliest date of (i) the Maturity Date; (ii) the date that the Company prepays all of the outstanding principal in full, or (iii) the date the loan payments are accelerated due to an event of default.

Other terms of the New Credit Facility remain generally identical to those under the Old Credit Facility, with certain covenants amended by the Second Amendment to provide the Company with additional operational flexibility, including the ability for the Company to issue up to $350.0 million in convertible notes. The New Credit Facility includes a conditional liquidity covenant commencing on June 15, 2023, which ceases to apply if certain conditions are satisfied.

Exhibit 10.16

EMPLOYMENT AGREEMENT

This Employment Agreement (this "Agreement"), dated as of January 5, 2022, is made by and between Seres Therapeutics, Inc., a Delaware corporation (together with any successor thereto, the "Company"), and Paula Cloghessy ("Executive") (collectively referred to as the "Parties" or individually referred to as a "Party").

RECITALS

A. It is the desire of the Company to assure itself of the services of Executive by entering into this Agreement.

B. Executive and the Company mutually desire that Executive be employed by the Company on the terms herein provided, commencing on February 7, 2022 or another date mutually agreed by the Parties (the date Executive actually commences such employment, the "Effective Date").

C. This Agreement will become effective upon the Effective Date.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing and of the respective covenants and agreements set forth below, the Parties hereto agree as follows:

1.Employment.

(a) General. Effective as of the Effective Date, the Company shall employ Executive and Executive shall remain in the employ of the Company, for the period and in the positions set forth in this Section 1, and subject to the other terms and conditions herein provided.

(b) At-Will Employment. The Company and Executive acknowledge that Executive's employment is and shall continue to be at-will, as defined under applicable law, and that Executive's employment with the Company may be terminated by either Party at any time for any or no reason (subject to the notice requirements of Section 3(b)). This "at-will" nature of Executive's employment shall remain unchanged during Executive's tenure as an employee and may not be changed, except in an express writing signed by Executive and a duly authorized officer of the Company. If Executive's employment terminates for any reason, Executive shall not be entitled to any payments, benefits, damages, award or compensation other than as provided in this Agreement or otherwise agreed to in writing by the Company or as provided by applicable law. The term of this Agreement (the "Term") shall commence on the Effective Date and end on the date this Agreement is terminated under Section 3.

(c) Positions and Duties. During the Term, Executive shall serve as Executive Vice President, Chief People Officer of the Company, initially reporting directly to the Chief Executive Officer of the Company (the "CEO") with such responsibilities, duties and authority normally associated with such positions and as may from time to time be assigned to Executive, or altered,

by the CEO. Executive shall devote substantially all of Executive's working time and efforts to the business and affairs of the Company (which shall include service to its affiliates, if applicable) and shall not engage in outside business activities (including serving on outside boards or committees) without the consent of the CEO, provided that Executive shall be permitted to (i) manage Executive's personal, financial and legal affairs, (ii) participate in trade associations and (iii) serve on the board of directors of not-for-profit or tax-exempt charitable organizations, in each case, subject to compliance with this Agreement and provided that such activities do not materially interfere with Executive's performance of Executive's duties and responsibilities hereunder. Executive agrees to observe and comply with the rules and policies of the Company as adopted by the Company from time to time, in each case as amended from time to time, as set forth in writing, and as delivered or made available to Executive (each, a "Policy").

2.Compensation and Related Matters.

(a) Annual Base Salary. During the Term, Executive shall receive a base salary at a rate of $375,000 per annum, which shall be paid in accordance with the customary payroll practices of the Company and shall be pro-rated for partial years of employment. Such annual base salary shall be reviewed (and may be adjusted) from time to time by the Board of Directors of the Company or an authorized committee of the Board (in either case, the "Board," and such annual base salary, as it may be adjusted from time to time, the "Annual Base Salary").

(b) Bonus. During the Term, Executive will be eligible to participate in an annual incentive program established by the Board. Executive's annual incentive compensation under such incentive program (the "Annual Bonus") shall be targeted at 40% of Executive's Annual Base Salary (such target, as may be adjusted by the Board from time to time, the "Target Bonus"). The Annual Bonus payable under the incentive program shall be based on the achievement of performance goals to be determined by the Board and may be pro-rated for any partial year of employment. The payment of any Annual Bonus pursuant to the incentive program shall be subject to Executive's continued employment with the Company through the date of payment, except as otherwise provided in Section 4(b).

(c) Benefits. During the Term, Executive shall be eligible to participate in employee benefit plans, programs and arrangements of the Company (including medical, dental and 401(k) plans), subject to the terms and eligibility requirements thereof and as such plans, programs and arrangements may be amended or in effect from time to time. In no event shall Executive be eligible to participate in any severance plan or program of the Company, except as set forth in Section 4 of this Agreement.

(d) Vacation. During the Term, Executive shall be entitled to paid personal leave in accordance with the Company's Policies. Any vacation shall be taken at the reasonable and mutual convenience of the Company and Executive.

(e) Business Expenses. During the Term, the Company shall reimburse Executive for all reasonable travel and other business expenses incurred by Executive in the performance of Executive's duties to the Company in accordance with the Company's expense reimbursement Policy.

(f) Key Person Insurance. At any time during the Term, the Company shall have the right to insure the life of Executive for the Company's sole benefit. The Company shall have the right to determine the amount of insurance and the type of policy. Executive shall reasonably cooperate with the Company in obtaining such insurance by submitting to physical examinations, by supplying all information reasonably required by any insurance carrier, and by executing all necessary documents reasonably required by any insurance carrier, provided that any information provided to an insurance company or broker shall not be provided to the Company without the prior written authorization of Executive. Executive shall incur no financial obligation by executing any required document, and shall have no interest in any such policy.

(g) Equity. Subject to approval by the Board, the Company will grant Executive an option (the "Option") under the Company's 2015 Incentive Award Plan (the "Plan") to purchase 190,000 shares of the Company's common stock (subject to adjustment for corporate events as set forth in the Plan) at an exercise price per share equal to the per share fair market value of the Company's common stock on the date of grant, as determined in accordance with the Plan. The Option will vest as to 25% of the shares subject to the Option on the first anniversary of the Effective Date and as to an additional 6.25% of such shares upon Executive's completing each three months of continuous service to the Company thereafter. In all respects, the Option will be governed by and subject to the terms of the Plan and a separate stock option agreement to be entered into between Executive and the Company.

3. Termination.

Executive's employment hereunder and the Term may be terminated by the Company or Executive, as applicable, without any breach of this Agreement under the following circumstances and the Term will end on the Date of Termination:

(a) Circumstances.

(i) *Death*. Executive's employment hereunder shall terminate upon Executive's death.

(ii) *Disability*. If Executive has incurred a Disability, as defined below, the Company may terminate Executive's employment.

(iii) *Termination for Cause*. The Company may terminate Executive's employment for Cause, as defined below.

(iv) *Termination without Cause*. The Company may terminate Executive's employment without Cause.

(v) *Resignation from the Company for Good Reason.* Executive may resign Executive's employment with the Company for Good Reason, as defined below.

(vi) *Resignation from the Company Without Good Reason*. Executive may resign Executive's employment with the Company for any reason other than Good Reason or for no reason.

(b) Notice of Termination. Any termination of Executive's employment by the Company or by Executive under this Section 3 (other than termination pursuant to paragraph (a)(i)) shall be communicated by a written notice to the other Party hereto (i) indicating the specific termination provision in this Agreement relied upon, (ii) setting forth in reasonable detail the facts and circumstances claimed to provide a basis for termination of Executive's employment under the provision so indicated, if applicable, and (iii) specifying a Date of Termination which, if submitted by Executive, shall be at least forty-five (45) days following the date of such notice (a "Notice of Termination"); *provided, however*, that in the event that Executive delivers a Notice of Termination to the Company, the Company may, in its sole discretion, change the Date of Termination to any date that occurs following the date of the Company's receipt of such Notice of Termination and is prior to the date specified in such Notice of Termination but the termination will still be considered a resignation by Executive. A Notice of Termination submitted by the Company may provide for a Date of Termination on the date Executive receives the Notice of Termination, or any date thereafter elected by the Company in its sole discretion. The failure by the Company to set forth in the Notice of Termination any fact or circumstance which contributes to a showing of Cause shall not waive any right of the Company hereunder or preclude the Company from asserting such fact or circumstance in enforcing the Company's rights hereunder.

(c) Company Obligations upon Termination. Upon termination of Executive's employment pursuant to any of the circumstances listed in this Section 3, Executive (or Executive's estate) shall be entitled to receive the sum of: (i) the portion of Executive's Annual Base Salary earned through the Date of Termination, but not yet paid to Executive; (ii) any expense reimbursements owed to Executive pursuant to Section 2(e); and (iii) any amount accrued and arising from Executive's participation in, or benefits accrued under any employee benefit plans, programs or arrangements, which amounts shall be payable in accordance with the terms and conditions of such employee benefit plans, programs or arrangements (collectively, the "Company Arrangements"). Except as otherwise expressly required by law (e.g., COBRA) or as specifically provided herein, all of Executive's rights to salary, severance, benefits, bonuses and other compensatory amounts hereunder (if any) shall cease upon the termination of Executive's employment hereunder. In the event that Executive's employment is terminated by the Company for any reason, Executive's sole and exclusive remedy shall be to receive the payments and benefits described in this Section 3(c) or Section 4, as applicable.

(d) Deemed Resignation. Upon termination of Executive's employment for any reason, Executive shall be deemed to have resigned from all offices and directorships, if any, then held with the Company or any of its subsidiaries.

4. Severance Payments.

(a) Termination for Cause, or Termination Upon Death, Disability or Resignation from the Company Without Good Reason. If Executive's employment shall terminate as a result of Executive's death pursuant to Section 3(a)(i) or Disability pursuant to Section 3(a)(ii), pursuant to Section 3(a)(iii) for Cause, or pursuant to Section 3(a)(vi) for Executive's resignation from the

Company without Good Reason, then Executive shall not be entitled to any severance payments or benefits, except as provided in Section 3(c).

(b) Termination without Cause, or Resignation from the Company for Good Reason. If Executive's employment terminates without Cause pursuant to Section 3(a)(iv), or pursuant to Section 3(a)(v) due to Executive's resignation for Good Reason, then, except as otherwise provided by Section 4(c) and subject to Executive signing on or before the 21st day following Executive's Separation from Service (as defined below), and not revoking, a release of claims substantially in the form attached as Exhibit A to this Agreement (the "Release"), and Executive's continued compliance with Section 5, Executive shall receive, in addition to payments and benefits set forth in Section 3(c), the following:

(i) an amount in cash equal to the product of (x) 1.0 times (y) the Annual Base Salary, payable in the form of salary continuation in regular installments over the 12-month period following the date of Executive's Separation from Service (the "Severance Period") in accordance with the Company's normal payroll practices;

(ii) to the extent unpaid as of the Date of Termination, an amount of cash equal to any Annual Bonus earned by Executive for the Company's fiscal year prior to the fiscal year in which the Date of Termination occurs, as determined by the Board in its discretion based upon actual performance achieved, which Annual Bonus, if any, shall be paid to Executive in the fiscal year in which the Date of Termination occurs when bonuses for such prior fiscal year are paid in the ordinary course to actively employed senior executives of the Company; and

(iii) if Executive timely elects to receive continued medical, dental or vision coverage under one or more of the Company's group healthcare plans pursuant to the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended ("COBRA"), then the Company shall directly pay, or reimburse Executive for, the COBRA premiums for Executive and Executive's covered dependents under such plans during the period commencing on Executive's Separation from Service and ending upon the earliest of (X) the last day of the Severance Period, (Y) the date that Executive and/or Executive's covered dependents become no longer eligible for COBRA or (Z) the date Executive becomes eligible to receive healthcare coverage from a subsequent employer (and Executive agrees to promptly notify the Company of such eligibility). Notwithstanding the foregoing, if the Company determines in its sole discretion that it cannot provide the foregoing benefit without potentially violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act) or incurring an excise tax, the Company shall in lieu thereof provide to Executive a taxable monthly payment in an amount equal to the monthly COBRA premium that Executive would be required to pay to continue Executive's and Executive's covered dependents' group health coverage in effect on the Date of Termination (which amount shall be based on the premium for the first month of COBRA coverage), which payments shall be made regardless of whether Executive elects COBRA continuation coverage and shall commence in the month following the month in which the Date of Termination occurs and shall end on the earlier of (X) the last day of the Severance Period, (Y) the date that Executive and/or Executive's covered dependents become no longer eligible for COBRA or (Z) the date Executive becomes eligible to receive healthcare

coverage from a subsequent employer (and Executive agrees to promptly notify the Company of such eligibility).

(c) Change in Control. In lieu of the payments and benefits set forth in Section 4(b), in the event Executive's employment terminates without Cause pursuant to Section 3(a)(iv), or pursuant to Section 3(a)(v) due to Executive's resignation for Good Reason, in either case, within 60 days prior to or 12 months following the date of a Change in Control, subject to Executive signing on or before the 21st day following Executive's Separation from Service, and not revoking, the Release, and Executive's continued compliance with Section 5, Executive shall receive the following:

(i) without duplication, the payments and benefits described in Section 4(b);

(ii) an amount in cash equal to the product of (x) 1.0 times (y) the Target Bonus, payable in a lump sum within thirty (30) days following the later of Executive's Separation from Service and the date of a Change in Control; and

(iii) all unvested equity or equity-based awards held by Executive under any Company equity compensation plans that vest solely based on the passage of time shall immediately become 100% vested (and if the Date of Termination precedes the Change in Control, all such unvested awards shall remain outstanding and eligible to vest in accordance with this Section 4(c)(iii) if a Change Control occurs within 60 days after the Date of Termination, provided that in no event will any such award remain outstanding beyond the final expiration date of the award set forth in the documents governing such award), with any other equity or equity-based awards (including awards that vest in whole or in part based on the attainment of performance-vesting conditions) being governed by the terms of the applicable award agreement.

(d) Survival. Notwithstanding anything to the contrary in this Agreement, the provisions of Sections 5 through 9 will survive the termination of Executive's employment and the termination of the Term.

5.Restrictive Covenants. As a condition to the effectiveness of this Agreement, Executive will execute and deliver to the Company no later than the Effective Date the Employee Non-Competition, Non-Solicitation, Confidentiality and Assignment Agreement attached as Exhibit B (the "Proprietary Information Agreement"). Executive agrees to abide by the terms of the Proprietary Information Agreement, which are hereby incorporated by reference into this Agreement. Executive acknowledges that the provisions of the Proprietary Information Agreement will survive the termination of Executive's employment and the termination of the Term for the periods set forth in the Proprietary Information Agreement.

6.Assignment and Successors.

The Company may assign its rights and obligations under this Agreement to any of its affiliates or to any successor to all or substantially all of the business or the assets of the Company (by merger or otherwise), and may assign or encumber this Agreement and its rights hereunder as security for indebtedness of the Company and its affiliates. This Agreement shall be binding upon

and inure to the benefit of the Company, Executive and their respective successors, assigns, personal and legal representatives, executors, administrators, heirs, distributees, devisees, and legatees, as applicable. None of Executive's rights or obligations may be assigned or transferred by Executive, other than Executive's rights to payments hereunder, which may be transferred only by will or operation of law. Notwithstanding the foregoing, Executive shall be entitled, to the extent permitted under applicable law and applicable Company Arrangements, to select and change a beneficiary or beneficiaries to receive compensation hereunder following Executive's death by giving written notice thereof to the Company.

7.Certain Definitions.

(a) Cause. The Company shall have "Cause" to terminate Executive's employment hereunder upon:

(i) Executive's refusal to (A) substantially perform Executive's duties with the Company (other than any such failure resulting from Executive's Disability) or (B) comply with, in any material respect, any of the Company's Policies;

(ii) the Board's determination that Executive refused in any material respect to carry out or comply with any lawful and reasonable directive of the Board;

(iii) Executive's material breach of a material provision of this Agreement;

(iv) Executive's conviction, plea of no contest, plea of *nolo contendere*, or imposition of unadjudicated probation for any felony or crime involving moral turpitude;

(v) Executive's unlawful use (including being under the influence) or possession of illegal drugs on the Company's (or any of its affiliate's) premises or while performing Executive's duties and responsibilities under this Agreement; or

(vi) Executive's commission of an act of fraud, embezzlement, misappropriation, willful misconduct, or breach of fiduciary duty against the Company or any of its affiliates;

provided, however, that Executive's termination will not be considered for Cause unless and until (a) the Company has provided Executive, within 60 days of the Company's knowledge of the occurrence of the facts and circumstances underlying the Cause event, written notice stating with reasonable specificity the applicable facts and circumstances underlying such finding of Cause and (b) in the case of alleged Cause under clause (i), (ii) or (iii) of the foregoing definition and to the extent the applicable condition or event is reasonably capable of being cured, Executive shall have failed to cure such condition or event within 30 days after the receipt of such notice.

(b) Change in Control. "Change in Control" shall have the meaning set forth in the version of the Seres Therapeutics, Inc. 2015 Incentive Award Plan in effect on the Effective Date.

(c) Code. "Code" shall mean the Internal Revenue Code of 1986, as amended, and the regulations and guidance promulgated thereunder.

(d) Date of Termination. "Date of Termination" shall mean (i) if Executive's employment is terminated by Executive's death, the date of Executive's death; or (ii) if Executive's employment is terminated pursuant to Section 3(a)(ii) – (vi) either the date indicated in the Notice of Termination or the date specified by the Company pursuant to Section 3(b), whichever is earlier.

(e) Disability. "Disability" shall mean, at any time the Company or any of its affiliates sponsors a long-term disability plan for the Company's employees, "disability" as defined in such long-term disability plan for the purpose of determining a participant's eligibility for benefits, *provided*, *however*, if the long-term disability plan contains multiple definitions of disability, "Disability" shall refer to that definition of disability which, if Executive qualified for such disability benefits, would provide coverage for the longest period of time. The determination of whether Executive has a Disability shall be made by the person or persons required to make disability determinations under the long-term disability plan. At any time the Company does not sponsor a long-term disability plan for its employees, "Disability" shall mean Executive's inability to perform, with or without reasonable accommodation, the essential functions of Executive's positions hereunder for a total of three months during any six-month period as a result of incapacity due to mental or physical illness as determined by a physician selected by the Company or its insurers and acceptable to Executive or Executive's legal representative, with such agreement as to acceptability not to be unreasonably withheld or delayed. Any refusal by Executive to submit to a medical examination for the purpose of determining Disability shall be deemed to constitute conclusive evidence of Executive's Disability.

(f) Good Reason. For the sole purpose of determining Executive's right to severance payments and benefits as described above, Executive's resignation will be for "Good Reason" if Executive resigns within ninety days after any of the following events, unless Executive consents to the applicable event: (i) a material decrease in Executive's Annual Base Salary, (ii) a material decrease in Executive's authority or areas of responsibility as are commensurate with Executive's title or positions, including Executive ceasing to report directly to the chief executive officer of the Company's ultimate parent company following a Change in Control (or of the Company if there is no such parent entity), (iii) the Company's material breach of a material provision of this Agreement or another written agreement with Executive or (iv) the relocation of Executive's primary office to a location more than 50 miles from the Boston metropolitan area. Notwithstanding the foregoing, no Good Reason will have occurred unless and until Executive has: (a) provided the Company, within 60 days of Executive's knowledge of the occurrence of the facts and circumstances underlying the Good Reason event, written notice stating with reasonable specificity the applicable facts and circumstances underlying such finding of Good Reason; (b) provided the Company with an opportunity to cure the same within 30 days after the receipt of such notice; and (c) the Company shall have failed to cure such condition within such 30 day period.

8.Parachute Payments.

(a) Notwithstanding any other provisions of this Agreement or any Company equity plan or agreement, in the event that any payment or benefit by the Company or otherwise to or for the benefit of Executive, whether paid or payable or distributed or distributable pursuant to the terms of this Agreement or otherwise (all such payments and benefits, including the payments and benefits under Section 4(b) and Section 4(c) hereof, being hereinafter referred to as the "Total

Payments"), would be subject (in whole or in part) to the excise tax imposed by Section 4999 of the Code (the "Excise Tax"), then the Total Payments shall be reduced (in the order provided in Section 8(b)) to the minimum extent necessary to avoid the imposition of the Excise Tax on the Total Payments, but only if (i) the net amount of such Total Payments, as so reduced (and after subtracting the net amount of federal, state and local income and employment taxes on such reduced Total Payments and after taking into account the phase out of itemized deductions and personal exemptions attributable to such reduced Total Payments), is greater than or equal to (ii) the net amount of such Total Payments without such reduction (but after subtracting the net amount of federal, state and local income and employment taxes on such Total Payments and the amount of the Excise Tax to which Executive would be subject in respect of such unreduced Total Payments and after taking into account the phase out of itemized deductions and personal exemptions attributable to such unreduced Total Payments).

(b) The Total Payments shall be reduced in the following order: (i) reduction on a pro-rata basis of any cash severance payments that are exempt from Section 409A of the Code ("Section 409A"), (ii) reduction on a pro-rata basis of any non-cash severance payments or benefits that are exempt from Section 409A, (iii) reduction on a pro-rata basis of any other payments or benefits that are exempt from Section 409A, and (iv) reduction of any payments or benefits otherwise payable to Executive on a pro-rata basis or such other manner that complies with Section 409A; provided, in case of clauses (ii), (iii) and (iv), that reduction of any payments attributable to the acceleration of vesting of Company equity awards shall be first applied to Company equity awards that would otherwise vest last in time.

(c) All determinations regarding the application of this Section 8 shall be made by an accounting firm or consulting group with experience in performing calculations regarding the applicability of Section 280G of the Code and the Excise Tax selected by the Company (the "Independent Advisors"). For purposes of determinations, no portion of the Total Payments shall be taken into account which, in the opinion of the Independent Advisors, (i) does not constitute a "parachute payment" within the meaning of Section 280G(b)(2) of the Code (including by reason of Section 280G(b)(4)(A) of the Code) or (ii) constitutes reasonable compensation for services actually rendered, within the meaning of Section 280G(b)(4)(B) of the Code, in excess of the "base amount" (as defined in Section 280G(b)(3) of the Code) allocable to such reasonable compensation. The costs of obtaining such determination and all related fees and expenses (including related fees and expenses incurred in any later audit) shall be borne by the Company.

(d) In the event it is later determined that a greater reduction in the Total Payments should have been made to implement the objective and intent of this Section 8, the excess amount shall be returned promptly by Executive to the Company.

9.Miscellaneous Provisions.

(a) Governing Law. This Agreement shall be governed, construed, interpreted and enforced in accordance with its express terms, and otherwise in accordance with the substantive laws of the Commonwealth of Massachusetts without reference to the principles of conflicts of law of the Commonwealth of Massachusetts or any other jurisdiction that would result in the application of the laws of a jurisdiction other than the Commonwealth of Massachusetts, and where applicable, the laws of the United States.

(b) Validity. The invalidity or unenforceability of any provision or provisions of this Agreement shall not affect the validity or enforceability of any other provision of this Agreement, which shall remain in full force and effect.

(c) Notices. Any notice, request, claim, demand, document and other communication hereunder to any Party shall be effective upon receipt (or refusal of receipt) and shall be in writing and delivered personally or sent by facsimile or certified or registered mail, postage prepaid, as follows:

(i) If to the Company, the Chief Legal Officer at its headquarters,

(ii) If to Executive, at the last address that the Company has in its personnel records for Executive, or

(iii) at any other address as any Party shall have specified by notice in writing to the other Party.

(d) Counterparts. This Agreement may be executed in several counterparts, each of which shall be deemed to be an original, but all of which together will constitute one and the same Agreement. Signatures delivered by facsimile or PDF shall be deemed effective for all purposes.

(e) Entire Agreement. The terms of this Agreement, and the Proprietary Information Agreement incorporated herein by reference as set forth in Section 5, are intended by the Parties to be the final expression of their agreement with respect to the subject matter hereof and supersede all prior understandings and agreements, whether written or oral. The Parties further intend that this Agreement shall constitute the complete and exclusive statement of their terms and that no extrinsic evidence whatsoever may be introduced in any judicial, administrative, or other legal proceeding to vary the terms of this Agreement.

(f) Amendments; Waivers. This Agreement may not be modified, amended, or terminated except by an instrument in writing, signed by Executive and a duly authorized officer of Company. By an instrument in writing similarly executed, Executive or a duly authorized officer of the Company may waive compliance by the other Party with any specifically identified provision of this Agreement that such other Party was or is obligated to comply with or perform; *provided*, *however*, that such waiver shall not operate as a waiver of, or estoppel with respect to, any other or subsequent failure. No failure to exercise and no delay in exercising any right, remedy, or power hereunder will preclude any other or further exercise of any other right, remedy, or power provided herein or by law or in equity.

(g) No Inconsistent Actions. The Parties hereto shall not voluntarily undertake or fail to undertake any action or course of action inconsistent with the provisions or essential intent of this Agreement. Furthermore, it is the intent of the Parties hereto to act in a fair and reasonable manner with respect to the interpretation and application of the provisions of this Agreement.

(h) Construction. This Agreement shall be deemed drafted equally by both the Parties. Its language shall be construed as a whole and according to its fair meaning. Any presumption or principle that the language is to be construed against any Party shall not apply. The headings in this Agreement are only for convenience and are not intended to affect construction or

interpretation. Any references to paragraphs, subparagraphs, sections or subsections are to those parts of this Agreement, unless the context clearly indicates to the contrary. Also, unless the context clearly indicates to the contrary, (i) the plural includes the singular and the singular includes the plural; (ii) "and" and "or" are each used both conjunctively and disjunctively; (iii) "any," "all," "each," or "every" means "any and all," and "each and every"; (iv) "includes" and "including" are each "without limitation"; (v) "herein," "hereof," "hereunder" and other similar compounds of the word "here" refer to the entire Agreement and not to any particular paragraph, subparagraph, section or subsection; and (vi) all pronouns and any variations thereof shall be deemed to refer to the masculine, feminine, neuter, singular or plural as the identity of the entities or persons referred to may require.

(i) Arbitration. Any controversy, claim or dispute arising out of or relating to this Agreement, shall be settled solely and exclusively by a binding arbitration process administered by JAMS/Endispute in Boston, Massachusetts. Such arbitration shall be conducted in accordance with the then-existing JAMS/Endispute Rules of Practice and Procedure, with the following exceptions if in conflict: (i) one arbitrator who is a retired judge shall be chosen by JAMS/Endispute; (ii) each Party to the arbitration will pay one-half of the expenses and fees of the arbitrator, together with other expenses of the arbitration incurred or approved by the arbitrator; and (iii) arbitration may proceed in the absence of any Party if written notice (pursuant to the JAMS/Endispute rules and regulations) of the proceedings has been given to such Party. Each Party shall bear its own attorney's fees and expenses; provided that the arbitrator may assess the prevailing Party's fees and costs against the non-prevailing Party as part of the arbitrator's award. The Parties agree to abide by all decisions and awards rendered in such proceedings. Such decisions and awards rendered by the arbitrator shall be final and conclusive. All such controversies, claims or disputes shall be settled in this manner in lieu of any action at law or equity; *provided, however*, that nothing in this subsection shall be construed as precluding the bringing of an action for injunctive relief or specific performance as provided in this Agreement or Proprietary Information Agreement. This dispute resolution process and any arbitration hereunder shall be confidential and neither any Party nor the neutral arbitrator shall disclose the existence, contents or results of such process without the prior written consent of all Parties, except where necessary or compelled in a court to enforce this arbitration provision or an award from such arbitration or otherwise in a legal proceeding. If JAMS/Endispute no longer exists or is otherwise unavailable, the Parties agree that the American Arbitration Association ("AAA") shall administer the arbitration in accordance with its then-existing rules as modified by this subsection. In such event, all references herein to JAMS/Endispute shall mean AAA. Notwithstanding the foregoing, Executive and the Company each have the right to resolve any issue or dispute over intellectual property rights by court action instead of arbitration.

(j) Enforcement. If any provision of this Agreement is held to be illegal, invalid or unenforceable under present or future laws effective during the Term, such provision shall be fully severable; this Agreement shall be construed and enforced as if such illegal, invalid or unenforceable provision had never comprised a portion of this Agreement; and the remaining provisions of this Agreement shall remain in full force and effect and shall not be affected by the illegal, invalid or unenforceable provision or by its severance from this Agreement. Furthermore, in lieu of such illegal, invalid or unenforceable provision there shall be added automatically as part of this Agreement a provision as similar in terms to such illegal, invalid or unenforceable provision as may be possible and be legal, valid and enforceable.

(k) Withholding. The Company shall be entitled to withhold from any amounts payable under this Agreement any federal, state, local or foreign withholding or other taxes or charges which the Company is required to withhold. The Company shall be entitled to rely on the advice of counsel if any questions as to the amount or requirement of withholding shall arise.

(l) Section 409A.

(i) *General.* The intent of the Parties is that the payments and benefits under this Agreement comply with or be exempt from Section 409A and, accordingly, to the maximum extent permitted, this Agreement shall be interpreted to be in compliance therewith.

(ii) *Separation from Service.* Notwithstanding anything in this Agreement to the contrary, any compensation or benefits payable under this Agreement that is designated under this Agreement as payable upon Executive's termination of employment shall be payable only upon Executive's "separation from service" with the Company within the meaning of Section 409A (a "Separation from Service") and, except as provided below, any such compensation or benefits described in Section 4 shall not be paid, or, in the case of installments, shall not commence payment, until the thirtieth (30th) day following Executive's Separation from Service (the "First Payment Date"). Any installment payments that would have been made to Executive during the thirty (30) day period immediately following Executive's Separation from Service but for the preceding sentence shall be paid to Executive on the First Payment Date and the remaining payments shall be made as provided in this Agreement.

(iii) *Specified Employee.* Notwithstanding anything in this Agreement to the contrary, if Executive is deemed by the Company at the time of Executive's Separation from Service to be a "specified employee" for purposes of Section 409A, to the extent delayed commencement of any portion of the benefits to which Executive is entitled under this Agreement is required in order to avoid a prohibited distribution under Section 409A, such portion of Executive's benefits shall not be provided to Executive prior to the earlier of (i) the expiration of the six-month period measured from the date of Executive's Separation from Service with the Company or (ii) the date of Executive's death. Upon the first business day following the expiration of the applicable Section 409A period, all payments deferred pursuant to the preceding sentence shall be paid in a lump sum to Executive (or Executive's estate or beneficiaries), and any remaining payments due to Executive under this Agreement shall be paid as otherwise provided herein.

(iv) *Expense Reimbursements.* To the extent that any reimbursements under this Agreement are subject to Section 409A, (i) any such reimbursements payable to Executive shall be paid to Executive no later than December 31 of the year following the year in which the expense was incurred, (ii) Executive shall submit Executive's reimbursement request promptly following the date the expense is incurred, (iii) the amount of expenses reimbursed in one year shall not affect the amount eligible for reimbursement in any subsequent year, other than medical expenses referred to in Section 105(b) of the Code, and (iv) Executive's right to reimbursement under this Agreement will not be subject to liquidation or exchange for another benefit.

(v) *Installments.* Executive's right to receive any installment payments under this Agreement, including without limitation any continuation salary payments that are payable on Company payroll dates, shall be treated as a right to receive a series of separate payments and, accordingly, each such installment payment shall at all times be considered a separate and distinct payment as permitted under Section 409A. Except as otherwise permitted under Section 409A, no payment hereunder shall be accelerated or deferred unless such acceleration or deferral would not result in additional tax or interest pursuant to Section 409A.

10.Executive Acknowledgement.

Executive acknowledges that Executive has read and understands this Agreement, is fully aware of its legal effect, has not acted in reliance upon any representations or promises made by the Company other than those contained in writing herein, and has entered into this Agreement freely based on Executive's own judgment.

[*Signature Page Follows*]

IN WITNESS WHEREOF, the Parties have executed this Agreement on the date and year first above written.

SERES THERAPEUTICS, INC.

By: /s/ Eric D. Shaff
Name: Eric D. Shaff
Title: President, CEO

/s/ Paula Cloghessy
Paula Cloghessy

EXHIBIT A

Separation Agreement and Release

This Separation Agreement and Release ("Agreement") is made by and between Paula Cloghessy ("Executive") and Seres Therapeutics, Inc. (the "Company") (collectively referred to as the "Parties" or individually referred to as a "Party"). Capitalized terms used but not defined in this Agreement shall have the meanings set forth in the Employment Agreement (as defined below).

WHEREAS, the Parties have previously entered into that certain Employment Agreement, dated as of _____, 2021 (the "Employment Agreement"); and

WHEREAS, in connection with Executive's termination of employment with the Company or a subsidiary or affiliate of the Company effective _____, 20__, the Parties wish to resolve any and all disputes, claims, complaints, grievances, charges, actions, petitions, and demands that Executive may have against the Company and any of the Releasees as defined below, including, but not limited to, any and all claims arising out of or in any way related to Executive's employment with or separation from the Company or its subsidiaries or affiliates but, for the avoidance of doubt, nothing herein will be deemed to release any rights or remedies in connection with Executive's ownership of vested equity securities of the Company or Executive's right to indemnification by the Company or any of its affiliates pursuant to contract or applicable law (collectively, the "Retained Claims").

NOW, THEREFORE, in consideration of the severance payments and benefits described in Section 4 of the Employment Agreement, which, pursuant to the Employment Agreement, are conditioned on Executive's execution and non-revocation of this Agreement, and in consideration of the mutual promises made herein, the Company and Executive hereby agree as follows:

1. Severance Payments and Benefits; Salary and Benefits. The Company agrees to provide Executive with the severance payments and benefits described in Section 4(b) and/or Section 4(c) of the Employment Agreement, payable at the times set forth in, and subject to the terms and conditions of, the Employment Agreement. In addition, to the extent not already paid, and subject to the terms and conditions of the Employment Agreement, the Company shall pay or provide to Executive all other payments or benefits described in Section 3(c) of the Employment Agreement, subject to and in accordance with the terms thereof.

2. Release of Claims. Executive agrees that, other than with respect to the Retained Claims, the foregoing consideration represents settlement in full of all outstanding obligations owed to Executive by the Company, any of its direct or indirect subsidiaries and affiliates, and any of its or their respective current and former officers, directors, equity holders, managers, employees, agents, investors, attorneys, shareholders, administrators, affiliates, benefit plans, plan administrators, insurers, trustees, divisions, and subsidiaries and predecessor and successor corporations and assigns (collectively, the "Releasees"). Executive, on Executive's own behalf and on behalf of any of Executive's affiliated companies or entities and any of Executive's or their respective heirs, family members, executors, agents, and assigns, other than with respect to the Retained Claims, hereby and forever releases the Releasees from, and agrees not to sue concerning, or in any manner to institute, prosecute, or pursue, any claim, complaint, charge, duty, obligation, or cause of action relating to any matters of any kind, whether presently known or unknown,

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suspected or unsuspected, that Executive may possess against any of the Releasees arising from any omissions, acts, facts, or damages that have occurred up until and including the date Executive signs this Agreement, including, without limitation:

(a) any and all claims relating to or arising from Executive's employment or service relationship with the Company or any of its direct or indirect subsidiaries or affiliates and the termination of that relationship;

(b) any and all claims relating to, or arising from, Executive's right to purchase, or actual purchase of any shares of stock or other equity interests of the Company or any of its affiliates, including, without limitation, any claims for fraud, misrepresentation, breach of fiduciary duty, breach of duty under applicable state law, and securities fraud under any state or federal law;

(c) any and all claims for wrongful discharge of employment; termination in violation of public policy; discrimination; harassment; retaliation; breach of contract, both express and implied; breach of covenant of good faith and fair dealing, both express and implied; promissory estoppel; negligent or intentional infliction of emotional distress; fraud; negligent or intentional misrepresentation; negligent or intentional interference with contract or prospective economic advantage; unfair business practices; defamation; libel; slander; negligence; personal injury; assault; battery; invasion of privacy; false imprisonment; conversion; and disability benefits;

(d) any and all claims for violation of any federal, state, or municipal statute, including, but not limited to, Title VII of the Civil Rights Act of 1964; the Civil Rights Act of 1991; the Rehabilitation Act of 1973; the Americans with Disabilities Act of 1990; the Equal Pay Act; the Fair Labor Standard Act; the Fair Credit Reporting Act; the Age Discrimination in Employment Act of 1967; the Older Workers Benefit Protection Act; the Employee Retirement Income Security Act of 1974; the Worker Adjustment and Retraining Notification Act; the Family and Medical Leave Act; and the Sarbanes-Oxley Act of 2002;

(e) any and all claims for violation of the federal or any state constitution;

(f) any and all claims arising out of any other laws and regulations relating to employment or employment discrimination;

(g) any claim for any loss, cost, damage, or expense arising out of any dispute over the non-withholding or other tax treatment of any of the proceeds received by Executive as a result of this Agreement;

(h) any and all claims arising out of the wage and hour and wage payments laws and regulations of the state or states in which Executive has provided service to the Company or any of its affiliates (including without limitation the Massachusetts Payment of Wages Law); and

(i) any and all claims for attorneys' fees and costs.

Executive agrees that the release set forth in this section shall be and remain in effect in all respects as a complete general release as to the matters released. This release does not release claims that cannot be released as a matter of law, including, but not limited to, Executive's right to report

possible violations of federal law or regulation to any governmental agency or entity in accordance with the provisions of and rules promulgated under Section 21F of the Securities Exchange Act of 1934 or Section 806 of the Sarbanes-Oxley Act of 2002, or any other whistleblower protection provisions of state or federal law or regulation (including Executive's right to receive an award for information provided to any such government agencies), Executive's right to file a charge with or participate in a charge by the Equal Employment Opportunity Commission, or any other local, state, or federal administrative body or government agency that is authorized to enforce or administer laws related to employment, against the Company (with the understanding that Executive's release of claims herein bars Executive from recovering monetary or other individual relief from the Company or any Releasee in connection with any charge, investigation or proceeding, or any related complaint or lawsuit, filed by Executive or by anyone else on Executive's behalf before the federal Equal Employment Opportunity Commission or a comparable state or local agency), claims for unemployment compensation or any state disability insurance benefits pursuant to the terms of applicable state law, claims to continued participation in certain of the Company's group benefit plans pursuant to the terms and conditions of COBRA, claims to any benefit entitlements vested as the date of separation of Executive's employment, pursuant to written terms of any employee benefit plan of the Company or its affiliates and Executive's right under applicable law, and any Retained Claims. This release further does not release claims for breach of Section 3(c), Section 4(b) or Section 4(c) of the Employment Agreement.

3. Acknowledgment of Waiver of Claims under ADEA. Executive understands and acknowledges that Executive is waiving and releasing any rights Executive may have under the Age Discrimination in Employment Act of 1967 ("ADEA"), and that this waiver and release is knowing and voluntary. Executive understands and agrees that this waiver and release does not apply to any rights or claims that may arise under the ADEA after the date Executive signs this Agreement. Executive understands and acknowledges that the consideration given for this waiver and release is in addition to anything of value to which Executive was already entitled. Executive further understands and acknowledges that Executive has been advised by this writing that: (a) Executive should consult with an attorney prior to executing this Agreement; (b) Executive has 21 days within which to consider this Agreement, and the Parties expressly agree that such time period to review this Agreement shall not be extended upon any material or immaterial changes to this Agreement; (c) Executive has seven business days following Executive's execution of this Agreement to revoke this Agreement pursuant to written notice to the General Counsel of the Company; (d) this Agreement shall not be effective until after the revocation period has expired; and (e) nothing in this Agreement prevents or precludes Executive from challenging or seeking a determination in good faith of the validity of this waiver under the ADEA, nor does it impose any condition precedent, penalties, or costs for doing so, unless specifically authorized by federal law. In the event Executive signs this Agreement and returns it to the Company in less than the 21 day period identified above, Executive hereby acknowledges that Executive has freely and voluntarily chosen to waive the time period allotted for considering this Agreement.

4. Post-Termination Obligations. Executive reaffirms Executive's continuing obligations under the Proprietary Information Agreement between Executive and the Company dated as of [_____], and, without limiting the foregoing, Executive remakes the non-competition covenants set forth in the Proprietary Information Agreement as if set forth herein. In addition, Executive agrees to refrain from Disparaging (as defined below) the Company and its affiliates,

including their respective services, technologies, practices, directors and officers. The Company agrees to instruct its officers and directors to refrain from Disparaging Executive. Nothing in this Section shall preclude any Party from making truthful statements that are reasonably necessary to comply with applicable law, regulation or legal process, or to defend or enforce a Party's rights under this Agreement or the Employment Agreement. For purposes of this Agreement, "Disparaging" means making remarks, comments or statements, whether written or oral, that impugn the character, integrity, reputation or abilities of the individual or entity being disparaged.

5. Severability. In the event that any provision or any portion of any provision hereof or any surviving agreement made a part hereof becomes or is declared by a court of competent jurisdiction or arbitrator to be illegal, unenforceable, or void, this Agreement shall continue in full force and effect without said provision or portion of provision.

6 No Oral Modification. This Agreement may only be amended in a writing signed by Executive and a duly authorized officer of the Company.

7. Governing Law; Dispute Resolution. This Agreement shall be subject to the provisions of Sections 9(a), 9(c) and 9(i) of the Employment Agreement.

8. Effective Date. Executive has seven business days after Executive signs this Agreement to revoke it and this Agreement will become effective upon the expiration of such seven business day period, so long as it has been signed by the Parties and has not been revoked by Executive before that date.

9. Trade Secrets; Whistleblower Protections. In accordance with 18 U.S.C. §1833, notwithstanding anything to the contrary in this Agreement, the Employment Agreement, the Proprietary Information Agreement or any other agreement between Executive and the Company or any of its subsidiaries in effect as of the date Executive receives this Agreement (together, the "Subject Documents"): (a) Executive will not be in breach of the Subject Documents, and shall not be held criminally or civilly liable under any federal or state trade secret law (i) for the disclosure of a trade secret that is made in confidence to a federal, state, or local government official or to an attorney solely for the purpose of reporting or investigating a suspected violation of law, or (ii) for the disclosure of a trade secret that is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal; and (b) if Executive files a lawsuit for retaliation by the Company for reporting a suspected violation of law, Executive may disclose the trade secret to Executive's attorney, and may use the trade secret information in the court proceeding, if Executive files any document containing the trade secret under seal, and does not disclose the trade secret, except pursuant to court order. Furthermore, the Parties agree that nothing in the Subject Documents prohibits Executive from reporting possible violations of federal law or regulation to any governmental agency or entity in accordance with the provisions of and rules promulgated under Section 21F of the Securities Exchange Act of 1934 or Section 806 of the Sarbanes-Oxley Act of 2002, or any other whistleblower protection provisions of state or federal law or regulation or releases or restrains Executive's right to receive an award for information provided to any such government agencies.

10. Voluntary Execution of Agreement. Executive understands and agrees that Executive executed this Agreement voluntarily, without any duress or undue influence on the part or behalf

of the Company or any third party, with the full intent of releasing all of Executive's claims against the Company and any of the other Releasees. Executive acknowledges that: (a) Executive has read this Agreement; (b) Executive has not relied upon any representations or statements made by the Company that are not specifically set forth in this Agreement; (c) Executive has been represented in the preparation, negotiation, and execution of this Agreement by legal counsel of Executive's own choice or has elected not to retain legal counsel; (d) Executive understands the terms and consequences of this Agreement and of the releases it contains; and (e) Executive is fully aware of the legal and binding effect of this Agreement.

[Signature Page Follows]

IN WITNESS WHEREOF, the Parties have executed this Agreement on the respective dates set forth below.

Dated:

_____
Paula Cloghessy

SERES THERAPEUTICS, INC.

Dated:

By:_____
Name:
Title:

EXHIBIT B

Employee Non-Competition, Non-Solicitation, Confidentiality and Assignment Agreement

In consideration and as a condition of my employment or continued employment (including my salary or wage, any bonus I may receive, and any equity granted to me) by Seres Therapeutics, Inc. (the "Company"), I hereby agree as follows:

1)**Proprietary Information**. I agree that all information, whether or not in writing, whether or not disclosed before or after I was first employed by the Company, concerning the Company's business, technology, business relationships or financial affairs that the Company has not released to the general public (collectively, "Proprietary Information"), and all tangible embodiments thereof, are and will be the exclusive property of the Company. By way of illustration, Proprietary Information may include information or material that has not been made generally available to the public, such as: (a) *corporate information*, including plans, strategies, methods, policies, resolutions, notes, email correspondence, negotiations or litigation; (b) *marketing information*, including strategies, methods, customer identities or other information about customers, prospect identities or other information about prospects, or market analyses or projections; (c) *financial information*, including cost and performance data, debt arrangements, equity structure, investors and holdings, purchasing and sales data and price lists; and (d) *operational and technological information*, including plans, specifications, manuals, forms, templates, software, designs, methods, procedures, formulas, discoveries, inventions, improvements, biological or chemical materials, concepts and ideas; and (e) *personnel information*, including personnel lists, reporting or organizational structure, resumes, personnel data, compensation structure, performance evaluations and termination arrangements or documents. Proprietary Information includes, without limitation, (1) information received in confidence by the Company from its customers or suppliers or other third parties, and (2) all biological or chemical materials and other tangible embodiments of the Proprietary Information. Nothing in this Agreement shall prohibit me from reporting possible violations of federal law or regulation to any governmental agency or entity in accordance with the provisions of and rules promulgated under Section 21F of the Securities Exchange Act of 1934 or Section 805 of the Sarbanes-Oxley Act of 2002, or any other whistleblower protection provisions of state or federal law or regulation.

2)**Recognition of Company's Rights**. I will not, at any time, without the Company's prior written permission, either during or after my employment, disclose or transfer any Proprietary Information to anyone outside of the Company, or use or permit to be used any Proprietary Information for any purpose other than the performance of my duties as an employee of the Company. I will cooperate with the Company and use my best efforts to prevent the unauthorized disclosure of all Proprietary Information. I will deliver to the Company all copies and other tangible embodiments of Proprietary Information in my possession or control upon the earlier of a request by the Company or termination of my employment.

3)**Rights of Others**. I understand that the Company is now and may hereafter be subject to non-disclosure or confidentiality agreements with third persons which require the Company to protect or refrain from use of proprietary information. I agree to be bound by the terms of such agreements in the event I have access to such proprietary information.

4)**Commitment to Company; Avoidance of Conflict of Interest**. While an employee of the Company, I will devote my full-time efforts to the Company's business and I will not engage in any other business activity that conflicts with my duties to the Company. I will advise the president of the Company or his or her nominee at such time as any activity of either the Company or another business presents me with a conflict of interest or the appearance of a conflict of interest as an employee of the Company. I will take whatever action is requested of me by the Company to resolve any conflict or appearance of conflict which it finds to exist.

5)**Developments**. I hereby assign and transfer and, to the extent any such assignment cannot be made at present, will assign and transfer, to the Company and its successors and assigns, all my right, title and interest in and to all Developments (as defined below) that: (a) are created, developed, made, conceived or reduced to practice by me (alone or jointly with others) or under my direction (collectively, "conceived") during the period of my employment and six (6) months thereafter and that relate to the business of the Company or to products, methods or services being researched, developed, manufactured or sold by the Company; or (b) result from tasks assigned to me by the Company; or (c) result from the use of premises, Proprietary Information or personal property (whether tangible or intangible) owned, licensed or leased by the Company (collectively, "Company-Related Developments"), and all patent rights, trademarks, copyrights and other intellectual property rights in all countries and territories worldwide claiming, covering or otherwise arising from or pertaining to Company-Related Developments (collectively, "Intellectual Property Rights"). I further agree that "Company-Related Developments" include, without limitation, all Developments that (i) were conceived by me before my employment, (ii) relate to the business of the Company or to products, methods or services being researched, developed, manufactured or sold by the Company, and (iii) were not subject to an obligation to assign to another entity when conceived. I will make full and prompt disclosure to the Company of all Company-Related Developments, as well as all other Developments conceived by me during the period of my employment and six (6) months thereafter. I acknowledge that all work performed by me as an employee of the Company is on a "work for hire" basis. I hereby waive all claims to any moral rights or other special rights

which I may have or accrue in any Company-Related Developments. "Developments" mean inventions, discoveries, designs, developments, methods, modifications, improvements, processes, biological or chemical materials, algorithms, databases, computer programs, formulae, techniques, trade secrets, graphics or images, audio or visual works, and other works of authorship.

To preclude any possible uncertainty, I have set forth on Exhibit A attached hereto a complete list of Developments conceived by me before my employment that are not Company-Related Developments ("Prior Inventions"). I have also listed on Exhibit A all patent rights of which I am an inventor, other than those contained within Intellectual Property Rights ("Other Patent Rights"). If no such disclosure is attached, I represent that there are no Prior Inventions or Other Patent Rights. If, in the course of my employment with the Company, I incorporate a Prior Invention into a Company product, process or research or development program or other work done for the Company, I hereby grant to the Company a nonexclusive, royalty-free, fully paid-up, irrevocable, perpetual, worldwide license (with the full right to sublicense through multiple tiers) to make, have made, modify, use, offer for sale, import and sell such Prior Invention. Notwithstanding the foregoing, I will not incorporate, or permit to be incorporated, Prior Inventions in any Company-Related Development without the Company's prior written consent.

I understand that to the extent this Agreement is required to be construed in accordance with the laws of any state which precludes a requirement in an employee agreement to assign certain classes of inventions made by an employee, this Section will be interpreted not to apply to any invention which a court rules and/or the Company agrees falls within such classes.

6)**Documents and Other Materials**. I will keep and maintain adequate and current records of all Proprietary Information and Company-Related Developments conceived by me, which records will be available to and remain the sole property of the Company at all times. All files, letters, notes, memoranda, reports, records, data, sketches, drawings, notebooks, layouts, charts, quotations and proposals, specification sheets, program listings, blueprints, models, prototypes, materials or other written, photographic or other tangible material containing or embodying Proprietary Information, whether created by me or others, which come into my custody or possession, are the exclusive property of the Company to be used by me only in the performance of my duties for the Company. In the event of the termination of my employment for any reason, I will deliver to the Company all of the foregoing, and all other materials of any nature pertaining to the Proprietary Information of the Company and to my work, and will not take or keep in my possession any of the foregoing or any copies. Any property situated on the Company's premises and owned by the Company, including laboratory space, computers, disks and other storage media, filing cabinets or other work areas, is subject to inspection by the Company at any time with or without notice.

7)**Enforcement of Intellectual Property Rights**. I will cooperate fully with the Company, both during and after my employment with the Company, with respect to the procurement, maintenance and enforcement of Intellectual Property Rights, as well as all other patent rights, trademarks, copyrights and other intellectual property rights in all countries and territories worldwide owned by or licensed to the Company. I will sign, both during and after the term of this Agreement, all papers, including copyright applications, patent applications, declarations, oaths, assignments of priority rights, and powers of attorney, which the Company may deem necessary or desirable in order to protect its rights and interests in any Company-Related Development or Intellectual Property Rights. If the Company is unable, after reasonable effort, to secure my signature on any such papers, I hereby irrevocably designate and appoint each officer of the Company as my agent and attorney-in-fact to execute any such papers on my behalf, and to take any and all actions as the Company may deem necessary or desirable in order to protect its rights and interests in the same.

8)**Non-Competition and Non-Solicitation**. In order to protect the Company's Proprietary Information and good will, during my employment and for a period of twelve (12) months following the termination of my employment for any reason (the "Restricted Period"):

a)in consideration of the offer of employment, my salary or wage, any bonus I may receive, and the equity granted to me in connection with commencement of employment with the Company, all of which I deem as fair and reasonable consideration for entering into this Agreement, I will not directly or indirectly, whether as owner, partner, shareholder, director, consultant, agent, employee, co-venturer or otherwise, engage, participate or invest in any business that develops, manufactures or markets microbiome therapeutics that are competitive with products or services of the Company, or that the Company has under development, or that are the subject of active planning at any time during my employment (collectively, the "Competitive Products"); provided that this will not prohibit any possible investment in publicly traded stock of a company representing less than one percent of the stock of such company and provided further that this provision shall apply only if I am an exempt employee (as that term is defined by the Fair Labor Standards Act) or if and when I subsequently become an exempt employee; and

b)I will not directly or indirectly, in any manner, other than for the benefit of the Company, (i) call upon, solicit, divert or take away any of the customers, business or prospective customers of the Company or any of its suppliers, and/or (ii) solicit, entice or attempt to persuade any other employee or consultant of the Company to leave the services of the Company for any reason.

I acknowledge and agree that if I violate any of the provisions of this Section, in addition to any other remedies to which the Company may be entitled in law or equity, the running of the Restricted Period will be extended by the time during which I engage in such violation(s) or up to twenty four (24) months, whichever is longer.

I acknowledge and agree that the provisions of this agreement shall apply during and following my employment by the Company and shall not be affected by any change in my job duties, whether material or immaterial.

I further acknowledge and agree that I have the right and have had the opportunity to consult with an attorney prior to signing this Agreement.

9)**Government Contracts**. I acknowledge that the Company may have from time to time agreements with other persons or with the United States Government or its agencies which impose obligations or restrictions on the Company regarding inventions made during the course of work under such agreements or regarding the confidential nature of such work. I agree to comply with any such obligations or restrictions upon the direction of the Company. In addition to the rights assigned under Section 5, I also assign to the Company (or any of its nominees) all rights which I have or acquired in any Developments, full title to which is required to be in the United States under any contract between the Company and the United States or any of its agencies.

10)**Prior Agreements**. I hereby represent that, except as I have fully disclosed previously in writing to the Company, I am not bound by the terms of any agreement with any previous employer or other party to refrain from using or disclosing any trade secret or confidential or proprietary information in the course of my employment with the Company or to refrain from competing, directly or indirectly, with the business of such previous employer or any other party. I further represent that my performance of all the terms of this Agreement as an employee of the Company does not and will not breach any agreement to keep in confidence proprietary information, knowledge or data acquired by me in confidence or in trust prior to my employment with the Company. I will not disclose to the Company or induce the Company to use any confidential or proprietary information or material belonging to any previous employer or others.

11)**Remedies Upon Breach**. I understand that the restrictions contained in this Agreement are necessary for the protection of the business and goodwill of the Company and I consider them to be reasonable for such purpose. Any breach of this Agreement is likely to cause the Company substantial and irrevocable damage and therefore, in the event of such breach, the Company, in addition to such other remedies which may be available, will be entitled to specific performance and other injunctive relief.

12)**Use of Voice, Image and Likeness**. I give the Company permission to use my voice, image or likeness, with or without using my name, for the purposes of advertising and promoting the Company, or for other purposes deemed appropriate by the Company in its reasonable discretion, except to the extent expressly prohibited by law.

13)**Publications and Public Statements**. I will obtain the Company's written approval before publishing or submitting for publication any material that relates to my work at the Company and/or incorporates any Proprietary Information. To ensure that the Company delivers a consistent message about its products, services and operations to the public, and further in recognition that even positive statements may have a detrimental effect on the Company in certain securities transactions and other contexts, any statement about the Company which I create, publish or post during my period of employment and for six (6) months thereafter, on any media accessible by the public, including but not limited to electronic bulletin boards and Internet-based chat rooms, must first be reviewed and approved by an officer of the Company before it is released in the public domain.

14)**No Employment Obligation**. I understand that this Agreement does not create an obligation on the Company or any other person to continue my employment. I acknowledge that, unless otherwise agreed in a formal written employment agreement signed on behalf of the Company by an authorized officer, my employment with the Company is at will and therefore may be terminated by the Company or me at any time and for any reason.

15)**Survival and Assignment by the Company**. I understand that my obligations under this Agreement will continue in accordance with its express terms regardless of any changes in my title, position, duties, salary,

compensation or benefits or other terms and conditions of employment. I further understand that my obligations under this Agreement will continue following the termination of my employment regardless of the manner of such termination and will be binding upon my heirs, executors and administrators. The Company will have the right to assign this Agreement to its affiliates, successors and assigns. I expressly consent to be bound by the provisions of this Agreement for the benefit of the Company or any parent, subsidiary or affiliate to whose employ I may be transferred without the necessity that this Agreement be resigned at the time of such transfer.

16)**Disclosure to Future Employers**. I will provide a copy of this Agreement to any prospective employer, partner or co-venturer prior to entering into an employment, partnership or other business relationship with such person or entity.

17)**Defend Trade Secrets Act Notice of Immunity Rights.** I acknowledge that the Company has provided me with the following notice of immunity rights in compliance with the requirements of the Defend Trade Secrets Act: (i) I shall not be held criminally or civilly liable under any Federal or State trade secret law for the disclosure of Proprietary Information that is made in confidence to a Federal, State, or local government official or to an attorney solely for the purpose of reporting or investigating a suspected violation of law, (ii) I shall not be held criminally or civilly liable under any Federal or State trade secret law for the disclosure of Proprietary Information that is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal and (iii) if I file a lawsuit for retaliation by the Company for reporting a suspected violation of law, I may disclose the Proprietary Information to my attorney and use the Proprietary Information in the court proceeding, if I file any document containing the Proprietary Information under seal, and do not disclose the Proprietary Information, except pursuant to court order.

18)**Exit Interview**. If and when I depart from the Company, I may be required to attend an exit interview and sign an "Employee Exit Acknowledgement" to reaffirm my acceptance and acknowledgement of the obligations set forth in this Agreement. During the Restricted Period following termination of my employment, I will notify the Company of any change in my address and of each subsequent employment or business activity, including the name and address of my employer or other post-Company employment plans and the nature of my activities.

19)**Severability**. In case any provisions (or portions thereof) contained in this Agreement will, for any reason, be held invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability will not affect the other provisions of this Agreement, and this Agreement will be construed as if such invalid, illegal or unenforceable provision had never been contained herein. If, moreover, any one or more of the provisions contained in this Agreement will for any reason be held to be excessively broad as to duration, geographical scope, activity or subject, it will be construed by limiting and reducing it, so as to be enforceable to the extent compatible with the applicable law as it will then appear.

20)**Entire Agreement**. This Agreement constitutes the entire and only agreement between the Company and me respecting the subject matter hereof, and supersedes all prior agreements and understandings, oral or written, between us concerning such subject matter. No modification, amendment, waiver or termination of this Agreement or of any provision hereof will be binding unless made in writing and signed by an authorized officer of the Company. Failure of the Company to insist upon strict compliance with any of the terms, covenants or conditions hereof will not be deemed a waiver of such terms, covenants or conditions. In the event of any inconsistency between this Agreement and any other contract between the Company and me, the provisions of this Agreement will prevail.

21)**Interpretation**. This Agreement will be deemed to be made and entered into in the Commonwealth of Massachusetts, and will in all respects be interpreted, enforced and governed under the laws of the Commonwealth of Massachusetts. I hereby agree to consent to personal jurisdiction of the state and federal courts situated within Suffolk County, Massachusetts for purposes of enforcing this Agreement, and waive any objection that I might have to personal jurisdiction or venue in those courts. As used in this Agreement, "including" means "including but not limited to".

22)

BY SIGNING BELOW, I CERTIFY THAT I HAVE READ THIS AGREEMENT CAREFULLY AND AM SATISFIED THAT I UNDERSTAND IT COMPLETELY.

IN WITNESS WHEREOF, the undersigned has executed this agreement as a sealed instrument as of the date set forth below.

Signed: _____
(Employee's full name)

Type or print name: Paula Cloghessy

Date: _____

|US-DOCS\64377647.6||

EXHIBIT A

To: [_____]

From: _____

Date: _____

SUBJECT: **Prior Inventions**

The following is a complete list of all inventions or improvements relevant to the subject matter of my employment by the Company that have been made or conceived or first reduced to practice by me alone or jointly with others prior to my engagement by the Company:

☐ No inventions or improvements

☐ See below:

_____

_____

_____

_____

_____

_____

_____

☐ Additional sheets attached

The following is a list of all patents, patent applications and other patent rights that I invented:

☐ None

☐ See below:

_____

_____

_____

_____

_____

_____

|US-DOCS\125170046.2||

SECOND AMENDMENT TO LOAN AND SECURITY AGREEMENT

THIS **SECOND AMENDMENT TO LOAN AND SECURITY AGREEMENT** (this "**Amendment**"), dated as of February 24, 2022 (the "**Second Amendment Effective Date**"), is made by and among Seres Therapeutics, Inc., a Delaware corporation, and each of its Subsidiaries from time to time party to the Loan Agreement (individually or collectively, as the context may require, "**Borrower**"), the several banks and other financial institutions or entities from time to time parties to the Loan Agreement (each, a "**Lender**", and collectively, the "**Lenders**") and Hercules Capital, Inc., a Maryland corporation, in its capacity as administrative agent and collateral agent for the Lenders (in such capacity, together with its successors and assigns in such capacity, "**Agent**").

Borrower, the Lenders and Agent are parties to a Loan and Security Agreement dated as of October 29, 2019 (and as amended, restated or modified from time to time, the "**Loan and Security Agreement**"). Borrower has requested that the Lenders agree to certain amendments to the Loan and Security Agreement. The Lenders have agreed to such request, subject to the terms and conditions hereof.

Accordingly, the parties hereto agree as follows:

1. Definitions; Interpretation.

(a) **Terms Defined in Loan and Security Agreement**. All capitalized terms used in this Amendment (including in the recitals hereof) and not otherwise defined herein shall have the meanings assigned to them in the Loan and Security Agreement.

(b) **Interpretation**. The rules of interpretation set forth in the last paragraph of Section 1.1 of the Loan and Security Agreement shall be applicable to this Amendment and are incorporated herein by this reference.

2. Amendments to the Loan and Security Agreement. The Loan and Security Agreement (including the specific schedules and exhibits attached thereto) is hereby amended to delete the stricken text (indicated textually in the same manner as the following example: ~~stricken text~~) and to add the double-underlined text (indicated textually in the same manner as the following example: double-underlined text) as set forth in the pages of the agreement attached as Exhibit A hereto. Each reference in the Loan and Security Agreement to "this Agreement" and the words "hereof," "herein," "hereunder," or words of like import, shall mean and be a reference to the Loan and Security Agreement as amended by this Amendment.

SECTION 3 Conditions of Effectiveness. The effectiveness of Section 2 of this Amendment shall be subject to the satisfaction of each of the following conditions precedent:

(a) **Fees and Expenses**. Borrower shall have paid (i) invoiced out-of-pocket costs and expenses of Agent and Lenders, the fees and disbursements of counsel to Agent and Lenders, in connection with the negotiation, preparation, execution and delivery of this Amendment and any other documents to be delivered in connection herewith, and (ii) all other invoiced fees, costs and expenses, due and payable as of the Second Amendment Effective Date under the Loan and Security Agreement (including the Second Amendment Date Facility Charge).

(b) **This Amendment**. Agent shall have received this Amendment, duly executed by Agent, the Lenders and Borrower; and

(c) **Board Resolutions**. Agent shall have received a copy of resolutions of Borrower's Board evidencing approval of this Amendment and the additional Term Loan Advances permitted thereunder.

(d) **Representations and Warranties; No Default**. On the Amendment Effective Date, after giving effect to the amendment of the Loan and Security Agreement contemplated hereby:

(i) The representations and warranties contained in Section 4 shall be true and correct on and as of the Amendment Effective Date as though made on and as of such date;

(ii) The copy of the resolutions of Borrower's Board approving this Amendment and the additional Term

Loan Advances permitted thereunder is true and correct and which resolutions are in full force and effect, without amendment, modification or rescission, on the date hereof; and

(iii) There exist no Events of Default or events that with the passage of time would result in an Event of Default.

SECTION 4 Representations and Warranties. To induce the Lenders to enter into this Amendment, Borrower hereby confirms, after giving effect to this Amendment, (a) that the representations and warranties made by it in Section 5 of the Loan and Security Agreement and in the other Loan Documents are true and correct in all material respects, except to the extent such representations and warranties expressly relate to an earlier date; and (b) that there has not been and there does not exist a Material Adverse Effect; and (c) the execution, delivery and performance of this Amendment by Borrower (i) will not result in the creation or imposition of any Lien upon the Collateral, other than Permitted Liens, (ii) will not violate any provisions of Borrower's Organizational Documents or any law, regulation, order, injunction, judgment, decree or writ to which Borrower is subject in any material respect, and (iii) will not violate any material contract or agreement or require the consent or approval of any other Person which has not already been obtained. For the purposes of this Section 4, each reference in Section 5 of the Loan and Security Agreement to "this Agreement," and the words "hereof," "herein," "hereunder," or words of like import in such Section, shall mean and be a reference to the Loan and Security Agreement as amended by this Amendment.

SECTION 5 Miscellaneous.

(a) **Loan Documents Otherwise Not Affected; Reaffirmation; No Novation.**

(i) Except as expressly amended pursuant hereto or referenced herein, the Loan and Security Agreement and the other Loan Documents shall remain unchanged and in full force and effect and are hereby ratified and confirmed in all respects. The Lenders' and Agent's execution and delivery of, or acceptance of, this Amendment shall not be deemed to create a course of dealing or otherwise create any express or implied duty by any of them to provide any other or further amendments, consents or waivers in the future.

(ii) Borrower hereby expressly (1) reaffirms, ratifies and confirms its obligations under the Loan and Security Agreement and the other Loan Documents, (2) reaffirms, ratifies and confirms the grant of security under Section 3.1 of the Loan and Security Agreement, (3) reaffirms that such grant of security in the Collateral secures all Secured Obligations under the Loan and Security Agreement, and with effect from (and including) the Second Amendment Effective Date, such grant of security in the Collateral: (x) remains in full force and effect notwithstanding the amendments expressly referenced herein; and (y) secures all Secured Obligations under the Loan and Security Agreement, as amended by this Amendment, and the other Loan Documents, (4) agrees that this Amendment shall be a "Loan Document" under the Loan and Security Agreement and (5) agrees that the Loan and Security Agreement and each other Loan Document shall remain in full force and effect following any action contemplated in connection herewith.

(iii) This Amendment is not a novation and the terms and conditions of this Amendment shall be in addition to and supplemental to all terms and conditions set forth in the Loan Documents. Nothing in this Amendment is intended, or shall be construed, to constitute an accord and satisfaction of Borrower's Secured Obligations under or in connection with the Loan and Security Agreement and any other Loan Document or to modify, affect or impair the perfection or continuity of Agent's security interest in, (on behalf of itself and the Lenders) security titles to or other liens on any Collateral for the Secured Obligations.

(b) **Conditions**. For purposes of determining compliance with the conditions specified in Section 3, each Lender that has signed this Amendment shall be deemed to have consented to, approved or accepted or to be satisfied with, each document or other matter required thereunder to be consented to or approved by or acceptable or satisfactory to a Lender unless Agent shall have received notice from such Lender prior to the Amendment Effective Date specifying its objection thereto.

(c) **Release**. In consideration of the agreements of Agent and each Lender contained herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Borrower, on behalf of itself and its successors, assigns, and other legal representatives, hereby fully, absolutely, unconditionally and irrevocably

releases, remises and forever discharges Agent and each Lender, and its successors and assigns, and its present and former shareholders, affiliates, subsidiaries, divisions, predecessors, directors, officers, attorneys, employees, agents and other representatives (Agent, Lenders and all such other persons being hereinafter referred to collectively as the "**Releasees**" and individually as a "**Releasee**"), of and from all demands, actions, causes of action, suits, covenants, contracts, controversies, agreements, promises, sums of money, accounts, bills, reckonings, damages and any and all other claims, counterclaims, defenses, rights of set-off, demands and liabilities whatsoever of every name and nature, known or unknown, suspected or unsuspected, both at law and in equity, which Borrower, or any of its successors, assigns, or other legal representatives may now or hereafter own, hold, have or claim to have against the Releasees or any of them for, upon, or by reason of any circumstance, action, cause or thing whatsoever which arises at any time on or prior to the day and date of this Amendment for or on account of, or in relation to, or in any way in connection with the Loan and Security Agreement, or any of the other Loan Documents or transactions thereunder or related thereto. Borrower waives the provisions of California Civil Code section 1542, which states:

> A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS THAT THE CREDITOR OR RELEASING PARTY DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE AND THAT, IF KNOWN BY HIM OR HER, WOULD HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR OR RELEASED PARTY.

Borrower understands, acknowledges and agrees that the release set forth above may be pleaded as a full and complete defense and may be used as a basis for an injunction against any action, suit or other proceeding which may be instituted, prosecuted or attempted in breach of the provisions of such release. Borrower agrees that no fact, event, circumstance, evidence or transaction which could now be asserted or which may hereafter be discovered shall affect in any manner the final, absolute and unconditional nature of the release set forth above.

(d) **No Reliance**. Borrower hereby acknowledges and confirms to Agent and the Lenders that Borrower is executing this Amendment on the basis of its own investigation and for its own reasons without reliance upon any agreement, representation, understanding or communication by or on behalf of any other Person.

(e) **Binding Effect**. This Amendment binds and is for the benefit of the successors and permitted assigns of each party.

(f) **Governing Law**. THIS AMENDMENT AND THE RIGHTS AND OBLIGATIONS OF THE PARTIES HEREUNDER SHALL IN ALL RESPECTS BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH, THE INTERNAL LAWS OF THE STATE OF CALIFORNIA (WITHOUT REGARD TO THE CONFLICT OF LAWS PRINCIPLES THAT WOULD RESULT IN THE APPLICATION OF ANY LAWS OTHER THAN THE LAWS OF THE STATE OF CALIFORNIA), INCLUDING ALL MATTERS OF CONSTRUCTION, VALIDITY AND PERFORMANCE, REGARDLESS OF THE LOCATION OF THE COLLATERAL.

(g) **Complete Agreement; Amendments**. This Amendment 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 Amendment and the Loan Documents merge into this Amendment and the Loan Documents.

(h) **Severability of Provisions.** Each provision of this Amendment is severable from every other provision in determining the enforceability of any provision.

(i) **Counterparts**. This Amendment 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 Amendment. Delivery of an executed counterpart of a signature page of this Amendment by facsimile, portable document format (.pdf) or other electronic transmission will be as effective as delivery of a manually executed counterpart hereof.

(j) **Loan Documents**. This Amendment and the documents related thereto shall constitute Loan Documents.

[Balance of Page Intentionally Left Blank; Signature Pages Follow]

IN WITNESS WHEREOF, the parties hereto have duly executed this Amendment, as of the date first above written.

BORROWER:

SERES THERAPEUTICS, INC.

By: /s/ Eric D. Shaff
Name: Eric D. Shaff
Title: President & CEO

AGENT:

HERCULES CAPITAL, INC.

By: /s/ Jennifer Choe
Name: Jennifer Choe
Title: Associate General Counsel

LENDERS:

HERCULES CAPITAL, INC.

By: /s/ Jennifer Choe
Name: Jennifer Choe
Title: Associate General Counsel

HERCULES PRIVATE GLOBAL VENTURE GROWTH FUND I L.P.

By: Hercules Private Global Venture Growth Fund GP I LLC, its general partner

By: Hercules Adviser LLC, its sole member

By: /s/ Seth Meyer
Name: Seth Meyer
Title: Authorized Signatory

EXHIBIT A
AMENDED LOAN AND SECURITY AGREEMENT

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LOAN AND SECURITY AGREEMENT

THIS LOAN AND SECURITY AGREEMENT is made and dated as of October 29, 2019 and is entered into by and among SERES THERAPEUTICS, INC., a Delaware corporation, each of its Subsidiaries from time to time party hereto as borrower (individually or collectively, as the context may require, "Borrower"), and the several banks and other financial institutions or entities from time to time parties to this Agreement (each, a "Lender", and collectively "Lenders") and HERCULES CAPITAL, INC., a Maryland corporation, in its capacity as administrative agent and collateral agent for Lenders (in such capacity, "Agent").

RECITALS

A. Borrower has requested Lenders to make available to Borrower one or more Advances in an aggregate principal amount of up to $~~50,000,000~~100,000,000; and

B. Lenders are willing to make such Advances on the terms and conditions set forth in this Agreement.

AGREEMENT

NOW, THEREFORE, Borrower, Agent and Lenders agree as follows:

1.
DEFINITIONS AND RULES OF CONSTRUCTION

a. Unless otherwise defined herein, the following capitalized terms shall have the following meanings:

"Account Control Agreement(s)" means any agreement entered into by and among Agent, Borrower and a third party bank or other institution (including a Securities Intermediary) in which Borrower maintains a Deposit Account or an account holding Investment Property and which perfects Agent's first priority security interest in the subject account or accounts.

"ACH Authorization" means the ACH Debit Authorization Agreement in substantially the form of Exhibit G, provided that account numbers shall be redacted for security purposes if and when filed publicly by Borrower.

"Advance" means a Term Loan Advance.

"Advance Date" means the funding date of any Advance.

"Advance Request" means a request for an Advance submitted by Borrower to Agent in substantially the form of Exhibit A, provided that account numbers shall be redacted for security purposes if and when filed publicly by Borrower.

"Affiliate" means (a) any Person that directly or indirectly controls, is controlled by, or is under common control with the Person in question, (b) any Person directly or indirectly owning, controlling or holding with power to vote twenty percent (20%) or more of the outstanding voting securities of another Person, or (c) any Person twenty percent (20%) or more of whose outstanding voting securities are directly or indirectly owned, controlled or held by another Person with power to vote such securities. As used in the definition of "Affiliate," the term "control" means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of a Person, whether through ownership of voting securities, by contract or otherwise.

"Agreement" means this Loan and Security Agreement, as amended, restated, supplemented or otherwise modified from time to time.

"Amortization Date" means ~~December~~January 1, ~~2021~~2024, provided however, if as of such date the ~~Interest Only~~ Extension Condition is satisfied, then ~~June~~January 1, ~~2022~~2025.

"Anti-Corruption Laws" means all laws, rules, and regulations of any jurisdiction applicable to Borrower or any of their respective Affiliates from time to time concerning or relating to bribery or corruption, including without limitation the United States Foreign Corrupt Practices Act of 1977, as amended, the UK Bribery Act 2010 and other similar legislation in any other jurisdictions.

"Anti-Terrorism Laws" means 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.

"Biologics License Application" means an application for licensure of a biological product submitted to the FDA under 42 U.S.C. § 262 and 21 C.F.R. § 601.2 for permission to introduce, or deliver for introduction, a biologic product into interstate commerce.

"Blocked Person" means 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.

"Board" means, with respect to any Person that is a corporation, its board of directors, with respect to any Person that is a limited liability company, its board of managers, board of members or similar governing body, and with respect to any other Person that is a legal entity, such Person's governing body in accordance with its Organizational Documents.

"Business Day" means any day other than Saturday, Sunday and any other day on which banking institutions in the State of California are closed for business.~~"CARES Act" means the Coronavirus Aid, Relief and Economic Stability Act.~~

"Cash" means all cash, cash equivalents and liquid funds.

"CFC" means a controlled foreign corporation within the meaning of Section 957(a) of the Code.

"Change in Control" means any reorganization, recapitalization, consolidation or merger (or similar transaction or series of related transactions) of Borrower, sale or exchange of outstanding shares (or similar transaction or series of related transactions) of Borrower in which the holders of Borrower's outstanding shares immediately before consummation of such transaction or series of related transactions do not, immediately after consummation of such transaction or series of related transactions, retain shares representing more than fifty percent (50%) of the voting power of the surviving entity of such transaction or series of related transactions (or the parent of such surviving entity if such surviving entity is wholly owned by such parent), in each case without regard to whether Borrower is the surviving entity.

"Charter" means, with respect to any Person, such Person's incorporation, formation or equivalent documents, as in effect from time to time.

"Closing Date" means the date of this Agreement.

"Code" means the Internal Revenue Code of 1986, as amended.

"Compliance Certificate" means a certificate in the form attached hereto as Exhibit ~~D~~E.

"Contingent Obligation" means, as applied to any Person, any direct or indirect liability, contingent or otherwise, of that Person with respect to (i) any Indebtedness, lease, dividend, letter of credit or other obligation of

another, including any such obligation directly or indirectly guaranteed, endorsed, co-made or discounted or sold with recourse by that Person, or in respect of which that Person is otherwise directly or indirectly liable; (ii) any obligations with respect to undrawn letters of credit, corporate credit cards or merchant services issued for the account of that Person; and (iii) all obligations arising under any interest rate, currency or commodity swap agreement, interest rate cap agreement, interest rate collar agreement, or other agreement or arrangement designated to protect a Person against fluctuation in interest rates, currency exchange rates or commodity prices; provided, however, that the term "Contingent Obligation" shall not include endorsements for collection or deposit in the ordinary course of business. The amount of any Contingent Obligation shall be deemed, without duplication of the primary obligation, to be an amount equal to the stated or determined amount of the primary obligation in respect of which such Contingent Obligation is made or, if not stated or determinable, the maximum reasonably anticipated liability in respect thereof as determined by such Person in good faith; provided, however, that such amount shall not in any event exceed the maximum amount of the obligations under the guarantee or other support arrangement. For the avoidance of doubt, no Permitted Bond Hedge Transaction or Permitted Warrant Transaction will be considered a Contingent Obligation of Borrower.

"Copyright License" means any written agreement granting any right to use any Copyright or Copyright registration, now owned or hereafter acquired by Borrower or in which Borrower now holds or hereafter acquires any interest.

"Copyrights" means all copyrights, whether registered or unregistered, held pursuant to the laws of the United States of America, any State thereof, or of any other country.

"Deposit Accounts" means any "deposit accounts," as such term is defined in the UCC, and includes any checking account, savings account, or certificate of deposit.

"Domestic Subsidiary" means any Subsidiary organized under the laws of the United States of America, any State thereof, the District of Columbia, or any other jurisdiction within the United States of America.

"Due Diligence Fee" means $25,000, which fee has been paid to Agent prior to the Closing Date, and shall be deemed fully earned on such date regardless of the early termination of this Agreement.

"Equity Interests" means, with respect to any Person, the capital stock, partnership or limited liability company interest, or other equity securities or equity ownership interests of such Person.

"ERISA" means the Employee Retirement Income Security Act of 1974, as amended, and the regulations promulgated thereunder.

"Excluded Account" means any of the following accounts which are designated as such in writing to Agent as of the Closing Date or, with respect to any account opened after the Closing Date, in the next Compliance Certificate delivered after such account is opened: (i) accounts held by the MSC Subsidiary, (ii) accounts used exclusively to maintain cash collateral subject to a Permitted Lien, (iii) any payroll or benefits account, provided that the aggregate balance of all such accounts shall not exceed the amount of all payroll or related benefit payments required to be made in the two next payroll periods, and (iv) any zero balance account.

"Excluded Subsidiaries" means all Foreign Subsidiaries, Foreign Subsidiary Holding Companies and the MSC Subsidiary.

"Extension Condition" means satisfaction of each of the following events: (a) no default or Event of Default shall have occurred and be continuing and (b) the Regulatory Approval Milestone shall have been met.

"FDA" means the U.S. Food and Drug Administration or any successor thereto or any other comparable governmental authority.

"First Amendment" means that certain First Amendment to Loan and Security Agreement, dated as of the First Amendment Date, by and among Borrower, the Lenders and Agent.

"First Amendment Date" means April 24, 2020.

"Foreign Subsidiary" means a Subsidiary other than a Domestic Subsidiary.

"Foreign Subsidiary Holding Company" means any Domestic Subsidiary that owns (directly or indirectly) no material assets other than Equity Interests (or Equity Interests and debt interests) of one or more (a) CFCs or (b) other Foreign Subsidiary Holding Companies.

"GAAP" means generally accepted accounting principles in the United States of America, as in effect from time to time.

"Guarantor" means any subsidiary of Borrower that enters into a Guaranty.

"Guaranty" means a guaranty with respect to the Secured Obligations, in form and substance satisfactory to Agent.

"Indebtedness" means indebtedness of any kind, including (a) all indebtedness for borrowed money or the deferred purchase price of property or services (excluding trade credit entered into in the ordinary course of business), including reimbursement and other obligations with respect to surety bonds and letters of credit, (b) all obligations evidenced by notes, bonds, debentures or similar instruments, (c) all capital lease obligations, (d) equity securities of any Person subject to repurchase or redemption other than at the sole option of such Person, (e) "earnouts", purchase price adjustments, profit sharing arrangements, deferred purchase money amounts and similar payment obligations or continuing obligations of any nature arising out of purchase and sale contracts, (f) non-contingent obligations to reimburse any bank or Person in respect of amounts paid under a letter of credit, banker's acceptance or similar instrument, and (g) all Contingent Obligations.

"Initial Facility Charge" means a charge of $375,000.

"Intellectual Property" means all of Borrower's Copyrights; Trademarks; Patents; Licenses; trade secrets and inventions; mask works; Borrower's applications therefor and reissues, extensions, or renewals thereof; and Borrower's goodwill associated with any of the foregoing, together with Borrower's rights to sue for past, present and future infringement of Intellectual Property and the goodwill associated therewith.

~~"Interest Only Extension Condition" means satisfaction of each of the following events: (a) no default or Event of Default shall have occurred and be continuing and (b) Performance Milestone I and Performance Milestone II shall have been met.~~

"Investment" means any beneficial ownership (including stock, partnership interests, limited liability company interests or other securities) of or in any Person, or any loan, advance or capital contribution to any Person or the acquisition of any capital asset of another Person not in the ordinary course of Borrower's business.

"IRS" means the United States Internal Revenue Service.

"Joinder Agreements" means for each Subsidiary (other than Excluded Subsidiaries and the MSC Subsidiary), a completed and executed Joinder Agreement in substantially the form attached hereto as Exhibit G.

"License" means any Copyright License, Patent License, Trademark License or other Intellectual Property license of rights or interests.

"Lien" means any mortgage, deed of trust, pledge, hypothecation, assignment for security, security interest, encumbrance, levy, lien or charge of any kind, whether voluntarily incurred or arising by operation of law or otherwise,

against any property, any conditional sale or other title retention agreement, and any lease in the nature of a security interest.

"Loan" means the Advances made under this Agreement.

"Loan Documents" means this Agreement, Pledge Agreement, the promissory notes (if any), the ACH Authorization, the Account Control Agreements, any Joinder Agreements, all UCC Financing Statements, the Guaranty (if any), the Perfection Certificate, and any other documents executed in connection with the Secured Obligations or the transactions contemplated hereby, as the same may from time to time be amended, modified, supplemented or restated.

"Loan Party" means Borrower or any Guarantor.

~~"Market Capitalization" means, for any given date of determination, an amount equal to (a) the average of the daily volume weighted average price of Borrower's common stock as reported for each of the five (5) trading days preceding such date of determination (it being understood that a "trading day" shall mean a day on which shares of Borrower's common stock trade on the NASDAQ (or, if the primary listing of such common stock is on another exchange, on such other exchange) in an ordinary trading session) *multiplied by* (b) the total number of issued and outstanding shares of Borrower's common stock that are issued and outstanding on the date of the determination and listed on the NASDAQ (or, if the primary listing of such common stock is on another exchange, on such other exchange), subject to appropriate adjustment for any stock dividend, stock split, stock combination, reclassification or other similar transaction during the applicable calculation period.~~

"Material Adverse Effect" means a material adverse effect upon: (i) the business, operations, properties, assets or financial condition of Borrower and its Subsidiaries taken as a whole; or (ii) the ability of Borrower to perform or pay the Secured Obligations in accordance with the terms of the Loan Documents, or the ability of Agent or Lenders to enforce any of its rights or remedies with respect to the Secured Obligations; or (iii) the Collateral or Agent's Liens on the Collateral or the priority of such Liens.

"Material Intellectual Property" means all Intellectual Property the loss of which could reasonably be expected to have a Material Adverse Effect, provided that, for the avoidance of doubt, Intellectual Property related to SER109, 287, 301, and 401, including any indication that Borrower is pursuing as of the Closing Date.

"Maximum Term Loan Amount" means ~~Fifty~~One Hundred Million Dollars ($~~50,000,000.00~~100,000,000).

"MSC Investment Conditions" means that Borrower maintains Unrestricted Cash in an amount equal to or greater than 110% of the aggregate outstanding Secured Obligations (inclusive of any Prepayment Charge and End of Term Charge that would be due and owing if the outstanding Loans were prepaid at the time of measurement).

"MSC Subsidiary" means Seres Therapeutics Securities Corporation, a wholly-owned Subsidiary incorporated in the Commonwealth of Massachusetts or the State of Delaware for the purpose of holding Investments as a Massachusetts security corporation under 830 CMR 63.38B.1 of the Massachusetts tax code and applicable regulations (as the same may be amended, modified or replaced from time to time).

"Nestle License Agreement (2021)" means that certain License Agreement, dated July 1, 2021, between Borrower and NHSc Pharma Partners, as in effect as of the Second Amendment Effective Date.

"Non-Disclosure Agreement" means that certain Non-Disclosure Agreement/Confidentiality Agreement by and between Borrower and Agent dated as of August 14, 2019.

"OFAC" means the U.S. Department of Treasury Office of Foreign Assets Control.

"OFAC Lists" means, 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.

"Organizational Documents" means with respect to any Person, such Person's Charter, and (a) if such Person is a corporation, its bylaws, (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.

"Patent License" means any written agreement granting any right with respect to any invention on which a Patent is in existence or a Patent application is pending, in which agreement Borrower now holds or hereafter acquires any interest.

"Patents" means all letters patent of, or rights corresponding thereto, in the United States of America or in any other country, all registrations and recordings thereof, and all applications for letters patent of, or rights corresponding thereto, in the United States of America or any other country.

"Perfection Certificate" means that certain Perfection Certificate delivered by Borrower to Agent on the Second Amendment Effective Date.

~~"Performance Milestone I" means no later than June 30, 2020, Borrower shall have announced that Borrower's Phase 3 ECOSPOR III trial has achieved the protocol-specified primary efficacy endpoint of statistically significant improvement in recurrence of *C. difficile* infection up to 8 weeks after treatment, which supports the filing of a Biologics License Application with the FDA seeking regulatory approval of a Product for the treatment of *C. difficile* infection as the next clinical step.~~

~~"Performance Milestone II" means no later than October 31, 2020 (or, if (i) Performance Milestone I has been achieved or (ii) Borrower maintains Unrestricted Cash in an amount not less than $20,000,000 at all times from October 31, 2020 until the earlier of (x) December 31, 2020 or (y) the date this Performance Milestone II is met, no later than December 31, 2020), Borrower shall have announced that Borrower's Phase 2b ECORESET trial has achieved the protocol-specified primary efficacy endpoint of a statistically significant improvement in clinical remission after 10 weeks of induction dosing and demonstrates an approvable safety profile, which together shall be sufficient to qualify as "pivotal" data for one of two pivotal studies necessary for the filing of the Biologics License Application to the FDA seeking regulatory approval of a Product for the treatment of mild to moderate ulcerative colitis.~~

"Permitted Acquisition" means any acquisition (including without limitation by way of merger or in-licensing arrangement) by Borrower 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:

1. such acquisition is of a business or Person engaged in a line of business substantially related to that of Borrower or its Subsidiaries;

2. 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 7.13 hereof or (ii) such Person shall be merged with and into Borrower (with Borrower being the surviving entity);

3. if such acquisition is structured as the acquisition of assets, such assets shall be acquired by Borrower, and shall be free and clear of Liens other than Permitted Liens;

4. Borrower shall have delivered to Lenders not less than seven (7) nor more than twenty (20) days prior to the date of such acquisition, notice of such acquisition together with pro forma projected financial information, copies of all material documents relating to such acquisition, and historical financial statements for such acquired entity,

division or line of business (to the extent applicable), in each case in form reasonably satisfactory to Lenders and demonstrating compliance with the covenants set forth in Section 7.19 hereof on a pro forma basis as if the acquisition occurred on the first day of the most recent measurement period;

5. both immediately before and after such acquisition no default or Event of Default shall have occurred and be continuing; and

6. the sum of the purchase price of such proposed new acquisition, computed on the basis of total acquisition consideration paid or incurred, or to be paid or incurred, by Borrower with respect thereto, including any contingent or deferred acquisition consideration, and including the amount of Permitted Indebtedness assumed or to which such assets, businesses or business or ownership interest or shares, or any Person so acquired, is subject, shall not be greater than (i) $~~2,500,000~~7,500,000 in cash for any single acquisition or group of related acquisitions or (ii) $~~5,000,000~~15,000,000 in for all such acquisitions during the term of this Agreement; provided that acquisition consideration funded by proceeds from the sale and issuance of Borrower's Equity Interests in a transaction not resulting in a Change in Control, which sale and issuance has a primary purpose to fund such acquisition, and which sale and issuance is consummated substantially contemporaneously with (and in any event, prior to, but no more fifteen (15) days prior to) the consummation of such acquisition, shall be disregarded in determining compliance with this clause (f), provided further, that for any acquisition in which the consideration consists solely of Equity Interests of Borrower, the value of such Equity Interests shall be disregarded in determining compliance with this clause (f).

"Permitted Bond Hedge Transaction" means any call or capped call option (or substantively equivalent derivative transaction) relating to Borrower's common stock (or other securities or property following a merger event or other change of the common stock of Borrower) purchased by Borrower in connection with the issuance of any Permitted Convertible Debt.

"Permitted Convertible Debt" means Indebtedness that is convertible into a fixed number (subject to customary anti-dilution adjustments, "make-whole" increases and other customary changes thereto) of shares of common stock of Borrower (or other securities or property following a merger event or other change of the common stock of Borrower), cash or any combination thereof (with the amount of such cash or such combination determined by reference to the market price of such common stock or such other securities); provided that such Indebtedness shall (a) not require any scheduled amortization or otherwise required payment of principal prior to, or have a scheduled maturity date, earlier than, one hundred eighty (180) days after the Term Loan Maturity Date, (b) be unsecured, (c) not be guaranteed by any Subsidiary of Borrower that is not also a Loan Party, and (d) shall be Indebtedness of Seres Therapeutics, Inc. and not any Subsidiary thereof.

"Permitted Indebtedness" means:

1. Indebtedness of Borrower in favor of any Lender or Agent arising under this Agreement or any other Loan Document;

2. Indebtedness existing on the Closing Date which is disclosed in Schedule 1A;

3. Indebtedness of up to $~~500,000~~1,500,000 outstanding at any time secured by a Lien described in clause (g) of the defined term "Permitted Liens", provided such Indebtedness does not exceed the cost of the Equipment or software or other intellectual property financed with such Indebtedness;

4. (i) Indebtedness to trade creditors incurred in the ordinary course of business and (ii) Indebtedness incurred in the ordinary course of business with corporate credit cards in an aggregate amount not to exceed $~~500,000~~1,500,000 outstanding at any time;

5. Indebtedness that also constitutes a Permitted Investment or is secured by a Permitted Lien;

6. Subordinated Indebtedness;

7. reimbursement obligations in connection with letters of credit (i) that are unsecured and issued in the ordinary of business and (ii) that are secured by Cash and issued on behalf of Borrower or a Subsidiary in an amount not to exceed $~~3,000,000~~15,000,000 at any time outstanding;

8. ~~Indebtedness consisting of a loan under the Paycheck Protection Program of the CARES Act provided that (i) such loan shall be unsecured and shall not contain any terms or conditions that are adverse to Agent's and the Lenders' rights under this Agreement, including with respect to collateral, priority, preference and repayment terms, (ii) such loan shall be subject to Agent's written approval in its reasonable discretion prior to the closing thereof and (iii) any material modification to such loan shall be subject to Agent's written approval (a "**PPP Loan**");~~[Reserved];

9. intercompany Indebtedness as long as each of the Subsidiary obligor and the Subsidiary obligee under such Indebtedness is a Subsidiary that has executed a Joinder Agreement, or other intercompany Indebtedness resulting from a Permitted Investment in accordance with clause (j) of the defined term "Permitted Investments";

10. Permitted Convertible Debt in an aggregate principal amount not to exceed $~~150,000,000~~350,000,000 at any one time outstanding;

11. other unsecured Indebtedness in an amount not to exceed $~~1,000,000~~3,000,000 at any time outstanding; and

12. extensions, refinancings and renewals of any items of Permitted Indebtedness, provided that the principal amount is not increased or the terms modified to impose materially more burdensome terms upon Borrower or the applicable Subsidiary, as the case may be, and subject to any limitations on aggregate amount of such Indebtedness.

"Permitted Investment" means:

1. Investments existing (i) on the Closing Date which are disclosed in Schedule 1B and (ii) on the Second Amendment Effective Date which are disclosed in the Perfection Certificate;

2. (i) marketable direct obligations issued or unconditionally guaranteed by the United States of America or any agency or any State thereof maturing within one year from the date of acquisition thereof currently having a rating of at least A-2 or P-2 from either Standard & Poor's Corporation or Moody's Investors Services, (ii) commercial paper maturing no more than one year from the date of creation thereof and currently having a rating of at least A-2 or P-2 from either Standard & Poor's Corporation or Moody's Investors Services, (iii) certificates of deposit issued by any bank with assets of at least $500,000,000 maturing no more than one year from the date of investment therein, (iv) money market accounts, and (v) Investments pursuant to the investment policy that has been provided to the Agent prior to the Closing Date or any investment policy that has been approved by the Agent;

3. repurchases of stock of Borrower from former employees, directors, or consultants of Borrower under the terms of applicable repurchase agreements at the original issuance price of such securities in an aggregate amount not to exceed $500,000 in any fiscal year, provided that no Event of Default has occurred, is continuing or could exist after giving effect to the repurchases;

4. Investments accepted in connection with Permitted Transfers;

5. 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;

6. 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 clause (f) shall not apply to Investments of any Loan Party in any Subsidiary of a Loan Party;

7. 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 approved by Borrower's Board;

8. Investments consisting of travel advances in the ordinary course of business;

9. Investments in newly-formed Domestic Subsidiaries, provided that each such Domestic Subsidiary enters into a Joinder Agreement promptly after its formation and executes such other documents as shall be reasonably requested by Agent;

10. Investments in Foreign Subsidiaries not to exceed $~~500,000~~2,500,000 per fiscal year;

11. joint ventures or strategic alliances in the ordinary course of business consisting of the licensing of technology, the development of technology or the providing of technical support as permitted hereunder or the licensing of Intellectual Property on terms permitted hereunder in connection with co-promotion agreements with strategic pharmaceutical partners, provided, in each case, that cash Investments (if any) by Borrower or the applicable Subsidiary do not exceed $~~500,000~~5,000,000 in the aggregate in any fiscal year;

12. Investments in the MSC Subsidiary, so long as an Event of Default does not exist at the time of such Investment and would not exist after giving effect to such Investment and provided that Borrower is, at all times, in compliance with the MSC Investment Conditions;

13. Investments constituting Permitted Acquisitions;

14. Borrower's entry into (including payments of premiums in connection therewith), and the performance of obligations under, any Permitted Bond Hedge Transactions and Permitted Warrant Transactions in accordance with their terms; and

15. additional Investments that do not exceed $~~1,000,000~~3,000,000 in the aggregate.

"Permitted Liens" means:

1. Liens in favor of Agent;

2. Liens existing (i) on the Closing Date which are disclosed in Schedule 1C and (ii) on the Second Amendment Effective Date which are disclosed in the Perfection Certificate;

3. Liens for taxes, fees, assessments or other governmental charges or levies, either not yet delinquent or being contested in good faith by appropriate proceedings; provided, that Borrower maintains adequate reserves therefor in accordance with GAAP;

4. Liens securing claims or demands of materialmen, artisans, mechanics, carriers, warehousemen, landlords and other like Persons arising in the ordinary course of business and imposed without action of such parties; provided, that the payment thereof is not yet required;

5. Liens arising from judgments, decrees or attachments in circumstances which do not constitute an Event of Default hereunder;

6. the following deposits, to the extent made in the ordinary course of business: deposits under worker's compensation, unemployment insurance, social security and other similar laws, or to secure the performance of bids, tenders or contracts (other than for the repayment of borrowed money) or to secure indemnity, performance or other similar bonds for the performance of bids, tenders or contracts (other than for the repayment of borrowed money) or to secure statutory obligations (other than Liens arising under ERISA or environmental Liens) or surety or appeal bonds, or to secure indemnity, performance or other similar bonds;

7. Liens on Equipment or software or other intellectual property constituting purchase money Liens and Liens in connection with capital leases securing Indebtedness permitted in clause (c) of "Permitted Indebtedness";

8. Liens incurred in connection with Subordinated Indebtedness;

9. leasehold interests in leases or subleases and licenses (other than with respect to Intellectual Property) granted in the ordinary course of business and not interfering in any material respect with the business of the licensor;

10. Liens in favor of customs and revenue authorities arising as a matter of law to secure payment of custom duties that are promptly paid on or before the date they become due;

11. Liens on insurance proceeds securing the payment of financed insurance premiums that are promptly paid on or before the date they become due (provided that such Liens extend only to such insurance proceeds and not to any other property or assets);

12. statutory and common law rights of set-off and other similar rights as to deposits of cash and securities in favor of banks, other depository institutions and brokerage firms or securities intermediaries to cover fees, similar expenses and charges;

13. easements, servitudes, zoning restrictions, rights-of-way and similar encumbrances on real property imposed by law or arising in the ordinary course of business so long as they do not materially impair the value or marketability of the related property;

14. licenses and other arrangements for the use of Intellectual Property permitted hereunder;

15. (i) Liens on Cash securing obligations permitted under clause (g) of the definition of Permitted Indebtedness and (ii) security deposits in connection with real property leases, the combination of (i) and (ii) in an aggregate amount not to exceed $~~3,000,000~~15,000,000 at any time; ~~and~~

1. in connection with a permitted transfer described in clause (g) of the defined term "Permitted Transfer", (i) in connection with a royalty participation sale or buyout, any precautionary UCC filing in sole respect to the subject asset transferred thereby, or (ii) in connection with a synthetic royalty transaction, a security interest solely in the Intellectual Property giving rise to the financed revenue interest, provided that as a condition to any security interest described in this clause (ii), the following conditions shall have been met: (A) Borrower shall have entered into an amendment to this Agreement and such other Loan Documents as Agent may reasonably request to grant to Agent, for the ratable benefit of Lenders, a security interest in the subject Intellectual Property, and (B) a first/second lien intercreditor agreement in form and substance satisfactory to Agent, in Agent's good faith discretion, shall be in effect between Agent and the revenue interest financing investor, which shall provide, among other things, that any security interest granted to such investor shall at all times be subordinated to the security interest granted to secure the Secured Obligations; and

~~2.~~ ~~(p)~~ Liens incurred in connection with the extension, renewal or refinancing of the Indebtedness secured by Liens of the type described in clause (b) above; provided, that any extension, renewal or replacement Lien shall be limited to the property encumbered by the existing Lien and the principal amount of the Indebtedness being extended, renewed or refinanced (as may have been reduced by any payment thereon) does not increase.

"Permitted Transfers" means:

1. sales of Inventory in the ordinary course of business;

2. (i) licenses, obligations and other rights and arrangements pursuant to the Collaboration and License Agreement, dated January 9, 2016, by and between Nestec Ltd. and Borrower, as amended, restated or modified from time to time, (ii) licenses, obligations and other rights and arrangements granted pursuant to the Research and Collaboration and Option Agreement, dated March 11, 2019, by and between MedImmune, LLC and Borrower, as

amended, restated or modified form time to time, (iii) non-exclusive licenses and similar arrangements for the use of Intellectual Property in the ordinary course of business, and (iv) exclusive licenses, entered into on an arms' length basis, and which do not result in legal transfer of the licensed property, provided that such licenses are either (A) licenses of Intellectual Property which are exclusive with respect to geography only as to specific geographic territories or countries outside of the United States, or (B) a license of Intellectual Property which may be exclusive with respect to geography worldwide, including the United States, or just the United States, provided further that any exclusive license on the terms set forth in clause (B) shall be a "Permitted Transfer" only if following the entry into such license (or, as applicable, upon the effectiveness of exclusivity pursuant to such license) Borrower maintains Unrestricted Cash in an amount of at least 105% of the Secured Obligations at all times;

3. dispositions of worn-out, obsolete or surplus Equipment at fair market value in the ordinary course of business;

4. use of Cash in the ordinary course of business or as otherwise permitted herein;

5. sale of stock or other shares in the ordinary course of business;

6. transfers constituting the making of Permitted Investments, or the granting of Permitted Liens; ~~and~~

1. transfers by Borrower of the right to receive future royalties on net sale or other milestones for a product candidate of Borrower in connection with a royalty financing, revenue interest financing or a similar transaction (including without limitation a royalty participation buyout or sale), in exchange for an upfront payment of Unrestricted Cash in an amount not less than $25,000,000, provided that such arrangement does not provide for a security interest in Borrower's intellectual property other than a Permitted Lien described in clause (p) of the defined term "Permitted Liens"; and

~~2.~~ ~~(g)~~ other transfers of assets having a fair market value of not more than $~~500,000~~1,500,000 in the aggregate in any fiscal year, provided that this clause (h) shall not operate to consent to transfers of Intellectual Property or related assets, including in connection with an exclusive license, to the extent not permitted under clause (b) above.

"Permitted Warrant Transaction" means any call option, warrant or right to purchase (or substantively equivalent derivative transaction) relating to Borrower's common stock (or other securities or property following a merger event or other change of the common stock of Borrower) and/or cash (in an amount determined by reference to the price of such common stock) sold by Borrower substantially concurrently with any purchase by Borrower of a related Permitted Bond Hedge Transaction.

"Person" means any individual, sole proprietorship, partnership, joint venture, trust, unincorporated organization, association, corporation, limited liability company, institution, other entity or government.

"Pledge Agreement" means the Pledge Agreement dated as of the Closing Date between Borrower and Agent, as the same may from time to time be amended, restated, modified or otherwise supplemented.

"Products" means all products, software, service offerings, technical data or technology currently being designed, manufactured or sold by Borrower or any of its Subsidiaries or which Borrower or any of its Subsidiaries intends to sell, license, or distribute in the future including any products or service offerings under development, collectively, together with all products, software, service offerings, technical data or technology that have been sold, licensed or distributed by Borrower since formation.

"Receivables" means (i) all of Borrower's Accounts, Instruments, Documents, Chattel Paper, Supporting Obligations, letters of credit, proceeds of any letter of credit, and Letter of Credit Rights, and (ii) all customer lists, software, and business records related thereto.

"Redemption Conditions" means, with respect to any redemption by Borrower of any Permitted Convertible Debt, satisfaction of each of the following events: (a) no ~~Default~~default or Event of Default shall exist or result therefrom, and (b) both immediately before and at all times after such redemption, Borrower's Unrestricted Cash shall be no less than 150% of the outstanding Secured Obligations.

"Regulatory Approval Milestone" means that (i) the FDA has approved a Biologics License Application for SER-109 for an indication relating to the treatment of recurrent *Clostridioides difficile* infection with a label or indication that is generally consistent with that sought in Borrower's Biologics License Application submission and (ii) Borrower has received the $125,000,000 payment related to the "First Regulatory Approval by the FDA for the first Collaboration Product" as set forth in Section 7.2(a) of the Nestle License Agreement (2021).

"Required Lenders" means at any time, the holders of more than 50% of the sum of the aggregate unpaid principal amount of the Term Loan Advances then outstanding.

"Sanctioned Country" means, at any time, a country or territory which is the subject or target of any Sanctions.

"Sanctioned Person" means, at any time, (a) any Person listed in any Sanctions-related list of designated Persons maintained by the Office of Foreign Assets Control of the U.S. Department of the Treasury or the U.S. Department of State, or by the United Nations Security Council, the European Union or any EU member state, (b) any Person operating, organized or resident in a Sanctioned Country or (c) any Person controlled by any such Person.

"Sanctions" means economic or financial sanctions or trade embargoes imposed, administered or enforced from time to time by (a) the U.S. government, including those administered by the Office of Foreign Assets Control of the U.S. Department of the Treasury or the U.S. Department of State, or (b) the United Nations Security Council, the European Union or Her Majesty's Treasury of the United Kingdom.

"SBA Funding Date" means each date on which a Lender which is an SBIC funds any portion of the Loan, which such date can only occur upon the confirmation by Borrower in its sole discretion that on such date it meets the requirements under Addendum 2.

"Second Amendment Date Facility Charge" means a charge of $250,000, which is payable to Lenders ratably in accordance with Section 4.2(e).

"Second Amendment Effective Date" means February 24, 2022.

"Secured Obligations" means each Borrower's obligations under this Agreement and any Loan Document, including any obligation to pay any amount now owing or later arising.

"Subordinated Indebtedness" means Indebtedness subordinated to the Secured Obligations in amounts and on terms and conditions satisfactory to Agent in its reasonable discretion and subject to a subordination agreement in form and substance satisfactory to Agent in its reasonable discretion.

"Subsidiary" means an entity, whether a corporation, partnership, limited liability company, joint venture or otherwise, in which Borrower owns or controls 50% or more of the outstanding voting securities, directly or indirectly. If not otherwise specified, a Subsidiary shall mean a direct or indirect Subsidiary of Borrower, including each entity listed on Schedule 5.14 hereto.

"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 Commitment" means as to any Lender, the obligation of such Lender, if any, to make a Term Loan Advance to Borrower in a principal amount not to exceed the amount set forth under the heading "Term Commitment" opposite such Lender's name on Schedule 1.1.

"Term Loan Advance" means an Advance pursuant to Section 2.1(a)

"Term Loan Interest Rate" means, for any day, a per annum rate of interest equal to the greater of (i) the prime rate as reported in The Wall Street Journal, plus ~~4.40~~6.40%, and (ii) 9.65%.

"Term Loan Maturity Date" means ~~November~~October 1, ~~2023~~2024; provided that if ~~such day~~as of such date the Extension Condition is satisfied then the Term Loan Maturity Date shall be extended to October 1, 2025. If the applicable Term Loan Maturity Date is not a Business Day, the Term Loan Maturity Date shall be the immediately preceding Business Day.

"Trademark License" means any written agreement granting any right to use any Trademark or Trademark registration, now owned or hereafter acquired by Borrower or in which Borrower now holds or hereafter acquires any interest.

"Trademarks" means all trademarks (registered, common law or otherwise) and any applications in connection therewith, including registrations, recordings and applications in the United States Patent and Trademark Office or in any similar office or agency of the United States of America, any State thereof or any other country or any political subdivision thereof.

~~"Tranche III" means the advances pursuant to Section 2.1(a)(iii).~~

"Tranche V Facility Charge" means one half of one percent (0.5%) of the principal amount of the Tranche V Advance funded, which is payable to Lenders ratably in accordance with Section 4.2(e).

"Tranche ~~III~~VI Facility Charge" means one half of one percent (~~1.0~~0.5%) of the principal amount of any ~~Advance pursuant to~~ Tranche ~~III~~VI Advances funded, which is payable to Lenders ratably in accordance with Section 4.2(~~d~~f).

"UCC" means the Uniform Commercial Code as the same is, from time to time, in effect in the State of California; provided, 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, Agent's Lien on any Collateral is governed by the Uniform Commercial Code as the same is, from time to time, in effect in a jurisdiction other than the State of California, then the term "UCC" shall mean the Uniform Commercial Code as in effect, from time to time, in such other jurisdiction solely for purposes of the provisions thereof relating to such attachment, perfection, priority or remedies and for purposes of definitions related to such provisions.

"Unrestricted Cash" means unrestricted Cash of Borrower maintained in Deposit Accounts or other accounts in Borrower's name subject to an Account Control Agreement in favor of Agent, subject to any post-closing period provided under this Agreement to deliver Account Control Agreements.

"U.S. Person" means any Person that is a "United States person" as defined in Section 7701(a)(30) of the Code.

a. ~~1.1~~ Certain Additional Defined Terms. The following terms are defined in the Sections or subsections referenced opposite such terms:

Defined Term	Section

~~212788652 v9~~

263757953 v7

“Agent”	Preamble
“Assignee”	11.13
“Borrower”	Preamble
“Claims”	11.10
“Collateral”	3.1
“Confidential Information”	11.12
“End of Term Charge”	2.5(b)
“Event of Default”	9
“Financial Statements”	7.1
“Incremental End of Term Charge”	2.5(b)
“Lender”	Preamble
“Maximum Rate”	2.2
“Original End of Term Charge”	2.5(a)
“Prepayment Charge”	2.4
“Publicity Materials”	11.18
“Register”	11.7
“Rights to Payment”	1.1
“SBA”	7.16
“SBIC”	7.16
“SBIC Act”	7.16
“Tranche I Advances”	2.1(a)(i)
“Tranche II Advance”	2.1(a)(ii)
“Tranche IV Advance”	2.1(a)(iv)
“Tranche V Advance”	2.1(a)(v)
“Tranche VI Advances”	2.1(a)(vi)

~~212788652 v9~~

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Unless otherwise specified, all references in this Agreement or any Annex or Schedule hereto to a "Section," "subsection," "Exhibit," "Annex," or "Schedule" shall refer to the corresponding Section, subsection, Exhibit, Annex, or Schedule in or to this Agreement. Unless otherwise specifically provided herein, any accounting term used in this Agreement or the other Loan Documents shall have the meaning customarily given such term in accordance with GAAP, and all financial computations hereunder shall be computed in accordance with GAAP, consistently applied. Unless otherwise defined herein or in the other Loan Documents, terms that are used herein or in the other Loan Documents and defined in the UCC shall have the meanings given to them in the UCC. 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): (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.

Notwithstanding anything to the contrary in this Agreement or any other Loan Document, all terms of an accounting or financial nature used herein shall be construed, and all computations of amounts and ratios referred to herein shall be made without giving effect to any treatment of Indebtedness in respect of convertible debt instruments under Accounting Standards Codification 470-20 (or any other Accounting Standards Codification or Financial Accounting Standard having a similar result or effect) to value any such Indebtedness in a reduced or bifurcated manner as described therein, and such Indebtedness shall at all times be valued at the full stated principal amount thereof. For the avoidance of doubt, and without limitation of the foregoing, Permitted Convertible Debt shall at all times be valued at the full stated principal amount thereof and shall not include any reduction or appreciation in value of the shares deliverable upon conversion thereof.

2.
THE LOAN

a. Term Loan Advances.

i. Term Commitment.

1. *Tranche I.* Subject to the terms and conditions of this Agreement, (A) on the Closing Date, Lenders shall severally (and not jointly) make, and Borrower agrees to draw, a Term Loan Advance of $15,000,000, and (B) at any time prior to March 15, 2020, Borrower may request and Lenders shall severally (and not jointly) make, additional Term Loan Advances, in minimum increments of $5,000,000 (or if less than $5,000,000 the remaining amount of Term Loan Advances available to be drawn pursuant to this Section 2.1(a)(i)), provided that the aggregate principal amount of the Term Loan Advances made pursuant to this Section 2.1(a)(i) (collectively "Tranche I Advances") shall not exceed $25,000,000. As of the Second Amendment Effective Date, taking into account the principal amounts previously repaid and redrawn on the Second Amendment Effective Date, the Tranche I Advances have been fully funded and remain outstanding.

1. *Tranche II.* Subject to the terms and conditions of this Agreement, on the Second Amendment Effective Date, Lenders shall severally (and not jointly) make, and Borrower agrees to draw, a Term Loan Advance of $12,500,000 (the "Tranche II Advance").

2. *Tranche III.* [expired unfunded].

3. *Tranche IV.* Subject to the terms and conditions of this Agreement, on the Second Amendment Effective Date, Lenders shall severally (and not jointly) make, and Borrower agrees to draw, a Term Loan Advance of $12,500,000 (the "Tranche IV Advance").

4. ~~(ii)~~ *Tranche ~~H~~V.* Subject to the terms and conditions of this Agreement ~~and satisfaction of Performance~~, upon achievement of the Regulatory Approval Milestone ~~H~~, ~~on or~~

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~~prior to March~~but no later than December 15, ~~2021~~2023, Borrower may request, and Lenders shall severally (and not jointly) make, ~~an additional~~a Term Loan Advance (the "Tranche V Advance") of $~~12,500,000~~25,000,000.

5. ~~(iii)~~ *Tranche ~~III~~VI*. Subject to the terms and conditions of this Agreement and ~~future~~discretionary approval ~~by Lenders'~~of the applicable Lender(s) investment committee ~~to support the in-licensing or acquisition of assets by Borrower or other strategic initiatives of Borrower, on or prior to June 30, 2021~~, but no later than the Amortization Date, Borrower may request, and Lenders shall severally (and not jointly) make, one or more additional Term Loan Advances in minimum increments of $5,000,000 ~~(or if less than $5,000,000 the remaining~~, provided that the aggregate principal amount of Term Loan Advances ~~available to be drawn pursuant to~~made under this Section 2.1(a)(~~i)) in an aggregate principal amount up to $12,500,000~~vi) (collectively, the "Tranche VI Advances") shall not exceed $25,000,000.

The aggregate outstanding Term Loan Advances shall not exceed the Maximum Term Loan Amount. Each Term Loan Advance of each Lender shall not exceed its respective Term Commitment. Except as provided above with respect to any Tranche I Advances redrawn on the Second Amendment Effective Date, once repaid no Term Loan Advance may be reborrowed.

ii. Advance Request. To obtain a Term Loan Advance, Borrower shall complete, sign and deliver an Advance Request to Agent at least three (3) Business Days before the Advance Date, other than the Term Loan Advance to be made on the Closing Date or the Second Amendment Effective Date, which shall be at least one (1) Business Day before the Advance Date. Lenders shall fund the Term Loan Advance in the manner requested by the Advance Request provided that each of the conditions precedent to such Term Loan Advance is satisfied as of the requested Advance Date.

iii. Interest. The principal balance of each Term Loan Advance shall bear interest thereon from such Advance Date at the Term Loan Interest Rate based on a year consisting of 360 days, with interest computed daily based on the actual number of days elapsed. The Term Loan Interest Rate will float and change on the day the "prime rate" as reported in the Wall Street Journal changes from time to time.

iv. Payment. Borrower shall pay interest on each Term Loan Advance on the first Business Day of each month, beginning the month after the Advance Date continuing until the Amortization Date. Borrower shall repay the aggregate principal balance of the Term Loan Advances that is outstanding on the day immediately preceding the Amortization Date, in equal monthly installments of principal and interest (mortgage style) beginning on the Amortization Date and continuing on the first Business Day of each month thereafter until the Secured Obligations (other than inchoate indemnity obligations) are repaid, provided that if the Term Loan Interest Rate is adjusted in accordance with its terms, or the Amortization Date is extended, the amount of each subsequent monthly installment shall be recalculated. The entire principal balance of the Term Loan Advances and all accrued but unpaid interest hereunder, shall be due and payable on the Term Loan Maturity Date. Borrower shall make all payments under this Agreement without setoff, recoupment or deduction and regardless of any counterclaim or defense. If a payment hereunder becomes due and payable on a day that is not a Business Day, the due date thereof shall be the immediately preceding Business Day. Agent, for the benefit of Lenders, shall initiate debit entries to Borrower's account as authorized on the ACH Authorization (i) on each payment date of all periodic obligations payable to Lenders under each Term Loan Advance and (ii) out-of-pocket legal fees and costs incurred by Agent or Lenders in connection with Section 11.11 of this Agreement; provided that, with respect to clause (i) above, in the event that Agent informs Borrower that Agent shall not initiate a debit entry to Borrower's account for a certain amount of the periodic obligations due on a specific payment date, Borrower shall pay to Agent, for the benefit of Lenders, such amount of periodic obligations in full in immediately available funds on such payment date; provided, further, that, with respect to clause (i) above, if Agent informs Borrower that Agent shall not initiate a debit entry as described above later than the date that is three (3) Business Days prior to such payment date, Borrower shall pay to Agent, for the ratable benefit of Lenders, such amount of periodic obligations in full in immediately available funds on the date

that is three (3) Business Days after the date on which Agent notifies Borrower thereof; provided, further, that, with respect to clause (ii) above, in the event that Agent informs Borrower that Agent shall not initiate a debit entry to Borrower's account for specified out-of-pocket legal fees and costs incurred by Agent or Lenders, Borrower shall pay to Agent such amount in full in immediately available funds within three (3) Business Days.

b. Maximum Interest. Notwithstanding any provision in this Agreement or any other Loan Document, it is the parties' intent not to contract for, charge or receive interest at a rate that is greater than the maximum rate permissible by law that a court of competent jurisdiction shall deem applicable hereto (which under the laws of the State of California shall be deemed to be the laws relating to permissible rates of interest on commercial loans) (the "Maximum Rate"). If a court of competent jurisdiction shall finally determine that Borrower has actually paid to Lenders an amount of interest in excess of the amount that would have been payable if all of the Secured Obligations had at all times borne interest at the Maximum Rate, then such excess interest actually paid by Borrower shall be applied as follows: first, to the payment of the Secured Obligations consisting of the outstanding principal; second, after all principal is repaid, to the payment of Lenders' accrued interest, costs, expenses, professional fees and any other Secured Obligations; and third, after all Secured Obligations are repaid, the excess (if any) shall be refunded to Borrower.

c. Default Interest. In the event any payment is not paid on the scheduled payment date, other than due to a failure of any ACH debit due solely to an administrative or operational error of Agent or Lender or Borrower's bank if Borrower had the funds to make the payment when due and makes the payment within three (3) Business Days following Borrower's knowledge of such failure to pay, an amount equal to four percent (4%) of the past due amount shall be payable on demand. In addition, upon the occurrence and during the continuation of an Event of Default hereunder, all Secured Obligations, including principal, interest, compounded interest, and professional fees, shall bear interest at a rate per annum equal to the rate set forth in Section 2.1(c), plus four percent (4%) per annum. In the event any interest is not paid when due hereunder, delinquent interest shall be added to principal and shall bear interest on interest, compounded at the rate set forth in Section 2.1(c) or this Section 2.3, as applicable.

d. Prepayment. At its option, Borrower may at any time prepay all or a portion of the outstanding Advances by paying the entire principal balance (or such portion thereof), all accrued and unpaid interest thereon, together with a prepayment charge equal to the following percentage of the principal amount of the Advance being prepaid: for any prepayment of an Advance on or prior to the one year anniversary of the ~~Closing Date,~~ ~~3.0~~Second Amendment Effective Date, 2.0%; after the one-year anniversary of the ~~Closing~~Second Amendment Effective Date, through the two-year anniversary of the ~~Closing~~Second Amendment Effective Date, ~~2.0~~1.5%; and after the two-year anniversary of the ~~Closing Date~~Second Amendment Effective Date through the three-year anniversary of the Second Amendment Effective Date, 1.0% (each, a "Prepayment Charge"). No prepayment charge shall apply to any prepayment made pursuant to this Section 2.4 after the three-year anniversary of the Second Amendment Effective Date. Borrower agrees that the Prepayment Charge is a reasonable calculation of Lenders' lost profits in view of the difficulties and impracticality of determining actual damages resulting from an early repayment of the Advances. Borrower shall prepay the outstanding amount of all principal and accrued interest through the prepayment date and the Prepayment Charge upon the occurrence of a Change in Control. Notwithstanding the foregoing, Agent and Lenders agree to waive the Prepayment Charge if Agent and Lenders or their respective Affiliates (in their sole and absolute discretion) agree in writing to refinance the Advances prior to the Term Loan Maturity Date. Any amounts paid under this Section shall be applied by Agent to the then unpaid amount of any Secured Obligations (including principal and interest) pro rata to all scheduled amounts owed. For the avoidance of doubt, if a payment hereunder becomes due and payable on a day that is not a Business Day, the due date thereof shall be the immediately preceding Business Day.

b. End of Term Charge.

i. On the earliest to occur of (i) November 1, 2023, (ii) the date that Borrower prepays the outstanding Secured Obligations (other than any inchoate indemnity obligations and any other obligations which, by their terms, are to survive the termination of this Agreement) in full, or (iii) the date that the Secured Obligations become due and payable in full pursuant to the terms of this Agreement, Borrower

shall pay the Lender of the Tranche I Advances made hereunder, in respect of the Tranche I Advances made by such Lender, a charge of $1,212,500 (the "Original End of Term Charge").

ii. ~~2.5 End of Term Charge.~~ On the earliest to occur of (i) the Term Loan Maturity Date, (ii) the date that Borrower prepays the outstanding Secured Obligations (other than any inchoate indemnity obligations and any other obligations which, by their terms, are to survive the termination of this Agreement) in full, or (iii) the date that the Secured Obligations become due and payable in full pursuant to the terms of this Agreement, Borrower shall pay Lenders a charge of ~~4.85~~1.75% of the aggregate original principal amount of the Term Loan Advances made hereunder (including, for avoidance of doubt, the Tranche I Advances) (the "Incremental End of Term Charge", and together with the Original End of Term Charge, the "End of Term Charge").

i. Notwithstanding the required payment date of ~~such~~any End of Term Charge, the applicable pro rata portion of the applicable End of Term Charge shall be deemed earned by Lenders on the date the applicable Term Loan Advance is made. For the avoidance of doubt, if a payment hereunder becomes due and payable on a day that is not a Business Day, the due date thereof shall be the immediately preceding Business Day.

e. Pro Rata Treatment. Each payment (including prepayment) on account of any fee and any reduction of the Term Loan Advances shall be made pro rata according to the Term Commitments of the relevant Lenders.

f. Taxes; Increased Costs. Borrower, Agent and Lenders each hereby agree to the terms and conditions set forth on Addendum 1 attached hereto.

g. Treatment of Prepayment Charge and End of Term Charge. Borrower agrees that any Prepayment Charge and any End of Term Charge payable shall be presumed to be the liquidated damages sustained by each Lender as the result of the early termination, and Borrower agrees that it is reasonable under the circumstances currently existing and existing as of the Closing Date or the Second Amendment Effective Date, as applicable. The Prepayment Charge and the End of Term Charge shall also be payable in the event the Secured 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 Charge and End of Term Charge in connection with any such acceleration. Borrower agrees (to the fullest extent that each may lawfully do so): (a) each of the Prepayment Charge and the End of Term Charge is reasonable and is the product of an arm's length transaction between sophisticated business people, ably represented by counsel; (b) each of the Prepayment Charge and the End of Term Charge shall be payable notwithstanding the then prevailing market rates at the time payment is made; (c) there has been a course of conduct between Lenders and Borrower giving specific consideration in this transaction for such agreement to pay the Prepayment Charge and the End of Term Charge as a charge (and not interest) in the event of prepayment or acceleration; and (d) Borrower shall be estopped from claiming differently than as agreed to in this paragraph. Borrower expressly acknowledges that its agreement to pay each of the Prepayment Charge and the End of Term Charge to Lenders as herein described was on the Closing Date or the Second Amendment Effective Date, as applicable, and continues to be a material inducement to Lenders to provide the Term Loan Advances.

3.
SECURITY INTEREST

a. Grant of Security Interest. As security for the prompt and complete payment when due (whether on the payment dates or otherwise) of all the Secured Obligations, Borrower grants to Agent a security interest in all of Borrower's right, title, and interest in, to and under all of Borrower's personal property and other assets including without limitation the following (except as set forth herein) whether now owned or hereafter acquired (collectively, the "Collateral"): (a) Receivables; (b) Equipment; (c) Fixtures; (d) General Intangibles, (e) Inventory; (f) Investment Property; (g) Deposit Accounts; (h) Cash; (i) Goods; and all other tangible and intangible personal property of Borrower whether now or hereafter owned or existing, leased, consigned by or to, or acquired by,

Borrower and wherever located, and any of Borrower's property in the possession or under the control of Agent; and, to the extent not otherwise included, all Proceeds of each of the foregoing and all accessions to, substitutions and replacements for, and rents, profits and products of each of the foregoing; provided, however, that the Collateral shall include all Accounts and General Intangibles that consist of rights to payment and proceeds from the sale, licensing or disposition of all or any part, or rights in, the Intellectual Property (the "Rights to Payment"). Notwithstanding the foregoing, if a judicial authority (including a U.S. Bankruptcy Court) holds that a security interest in the underlying Intellectual Property is necessary to have a security interest in the Rights to Payment, then the Collateral shall automatically, and effective as of the date of this Agreement, include the Intellectual Property to the extent necessary to permit perfection of Agent's security interest in the Rights to Payment.

b. Excluded Collateral. Notwithstanding the broad grant of the security interest set forth in Section 3.1, above, the Collateral shall not include (a) any Intellectual Property, (b) more than 65% of the presently existing and hereafter arising issued and outstanding Equity Interests owned by Borrower of any Foreign Subsidiary or Foreign Subsidiary Holding Company which Equity Interests entitle the holder thereof to vote for directors or any other matter, (c) nonassignable licenses or contracts, including without limitation any licenses described in clause (b) of the defined term "Permitted Transfers", which by their terms require the consent of the licensor thereof or another party (but only to the extent such prohibition on transfer is enforceable under applicable law, including, without limitation, Sections 9406, 9407 and 9408 of the UCC), provided further, that upon the termination of such prohibition or such consent being provided with respect to any license or contract, such license or contract shall automatically be included in the Collateral, (d) property for which the granting of a security interest therein is contrary to applicable law, provided that upon the cessation of any such restriction or prohibition, such property shall automatically be included in the Collateral; (e) any Excluded Accounts; and (f) any cash collateral deposit subject to a Permitted Lien hereunder, if the grant of a security interest with respect to such property pursuant to this Agreement would be prohibited by the agreement creating such Permitted Lien or would otherwise constitute a default thereunder or create a right of termination a party thereto (other than Borrower), provided that upon the termination and release of such cash collateral, such property shall automatically be included in the Collateral.

4.
CONDITIONS PRECEDENT TO LOAN

The obligations of Lenders to make the Loan hereunder are subject to the satisfaction by Borrower of the following conditions:

a. Initial Advance. On or prior to the Closing Date, Borrower shall have delivered to Agent the following:

i. duly executed copies of the Loan Documents, (except to the extent permitted to be delivered post-closing in accordance with Section 4.4) Account Control Agreements, and all other documents and instruments reasonably required by Agent to effectuate the transactions contemplated hereby or to create and perfect the Liens of Agent with respect to all Collateral., in all cases in form and substance reasonably acceptable to Agent;

ii. a legal opinion of Borrower's counsel in form and substance reasonably acceptable to Agent;

iii. a copy of resolutions of Borrower's Board evidencing approval of the Loan and other transactions evidenced by the Loan Documents, certified by an officer of Borrower;

iv. copies of the Charter of Borrower, certified by the Secretary of State of the applicable jurisdiction of organization and the other Organizational Documents, as amended through the Closing Date, of Borrower certified by an officer of Borrower;

v. certificates of good standing for Borrower from the applicable jurisdiction of organization and similar certificates from all other jurisdiction in which Borrower does business and where the failure to be qualified could have a Material Adverse Effect;

vi. payment of the Due Diligence Fee, Initial Facility Charge and reimbursement of Agent's and Lenders' current expenses reimbursable pursuant to this Agreement, which amounts may be deducted from the initial Advance;

vii. all certificates of insurance, endorsements, and copies of each insurance policy required pursuant to Section 6.2; and

viii. such other documents as Agent may reasonably request.

b. All Advances. On each Advance Date:

i. Agent shall have received (i) an Advance Request for the relevant Advance as required by Section 2.1(b), duly executed by Borrower's Chief Executive Officer or Chief Financial Officer, and (ii) any other documents Agent may reasonably request.

ii. The representations and warranties set forth in this Agreement shall be true and correct in all material respects on and as of the Advance Date with the same effect as though made on and as of such date, except to the extent such representations and warranties expressly relate to an earlier date.

iii. Borrower shall be in compliance with all the terms and provisions set forth herein and in each other Loan Document on its part to be observed or performed, and at the time of and immediately after such Advance no Event of Default shall have occurred and be continuing.

iv. With respect to ~~any Advance pursuant to Tranche III~~the Tranche II Advance and the Tranche IV Advance (and in consideration of the modifications to the terms and provisions applicable to the outstanding Tranche I Advance), Borrower shall have paid the ~~Tranche III~~Second Amendment Date Facility Charge.

iii. With respect to the Tranche V Advance, Borrower shall have paid the Tranche V Facility Charge.

iv. With respect to any Tranche VI Advance, Borrower shall have paid the Tranche VI Facility Charge.

v. ~~(c)~~ With respect to any Tranche VI Advance~~ pursuant to Tranche III~~, Lenders' investment committee shall have approved the requested ~~Advances~~Tranche VI Advance, as contemplated by Section 2.1(a)(~~iii~~vi).

Each Advance Request shall be deemed to constitute a representation and warranty by Borrower on the relevant Advance Date as to the matters specified in subsections (b) and (c) of this Section 4.2 and as to the matters set forth in the Advance Request.

c. No Default. As of the Closing Date and each Advance Date, (i) no fact or condition exists that could (or could, with the passage of time, the giving of notice, or both) constitute an Event of Default and (ii) no event that has had or could reasonably be expected to have a Material Adverse Effect has occurred and is continuing.

d. Post-Closing Deliveries. Borrower shall:

i. deliver to Agent, in form and substance satisfactory to Agent, an Account Control Agreement with respect to Borrower's Deposit Accounts maintained with Bank of America within thirty (30) days of the Closing Date (or such longer period as the Agent may agree in its sole discretion); and

ii. use its commercially reasonable efforts to deliver to Agent, in form and substance satisfactory to Agent, a landlord waivers with respect to Borrower's leased location at 200 Sidney Street, Cambridge, MA 02139.

5.
REPRESENTATIONS AND WARRANTIES

Borrower represents and warrants that:

a. Organizational Status. Borrower is duly organized, legally existing and in good standing under the laws of its jurisdiction of organization, and is duly qualified as a foreign corporation, limited liability company or partnership, as the case may be, in all jurisdictions in which the nature of its business or location of its properties require such qualifications and where the failure to be qualified could reasonably be expected to have a Material Adverse Effect. Borrower's present name, former names (if any), locations, place of formation, tax identification number, organizational identification number and other information are correctly set forth in Exhibit B, as may be updated by Borrower in a written notice (including any Compliance Certificate) provided to Agent after the Closing Date in accordance with this Agreement (including in any Compliance Certificate).

b. Collateral. Borrower owns the Collateral and the Intellectual Property free of all Liens, except for Permitted Liens. Borrower has the power and authority to grant to Agent a Lien in the Collateral as security for the Secured Obligations.

c. Consents. Borrower's execution, delivery and performance of this Agreement and all other Loan Documents to which it is a party, (i) have been duly authorized by all necessary action in accordance with Borrower's Organizational Documents and applicable law, (ii) will not result in the creation or imposition of any Lien upon the Collateral, other than Permitted Liens, (iii) do not violate (A) any provisions of Borrower's Organizational Documents, or (B) any, law, regulation, order, injunction, judgment, decree or writ to which Borrower is subject in any material respect, and (iv) do not violate any material contract or agreement or require the consent or approval of any other Person which has not already been obtained. The individual or individuals executing the Loan Documents on behalf of Borrower are duly authorized to do so.

d. Material Adverse Effect. No Material Adverse Effect has occurred and is continuing, and Borrower is not aware of any event or circumstance that is likely to occur that is reasonably expected to result in a Material Adverse Effect.

e. Actions Before Governmental Authorities. There are no actions, suits or proceedings at law or in equity or by or before any governmental authority now pending or, to the knowledge of Borrower, threatened against or affecting Borrower or its property, that is reasonably expected to result in a Material Adverse Effect.

f. Laws.

i. Neither Borrower nor any of its Subsidiaries is in violation of any law, rule or regulation, or in default with respect to any judgment, writ, injunction or decree of any governmental authority, where such violation or default is reasonably expected to result in a Material Adverse Effect. Borrower is not in default under (i) any provision of any agreement or instrument evidencing material Indebtedness in any material respect, or (ii) any other agreement to which it is a party or by which it is bound that is reasonably expected to result in a Material Adverse Effect.

ii. Neither Borrower nor any of its Subsidiaries is an "investment company" or a company "controlled" by an "investment company" under the Investment Company Act of 1940, as amended. Neither Borrower nor any of its Subsidiaries 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). Borrower and each of its Subsidiaries has complied in all material respects with the Federal Fair Labor Standards Act. Neither Borrower nor any of its Subsidiaries 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. Neither Borrower's nor any of its Subsidiaries' properties or assets has been used by Borrower or such Subsidiary or, to Borrower's knowledge, by previous Persons, in disposing, producing, storing, treating, or transporting any hazardous substance other than in material

compliance with applicable laws. Borrower and each of its Subsidiaries 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.

iii. None of Borrower, any of its Subsidiaries, or, to the knowledge of Borrower, any of Borrower's 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. None of Borrower, any of its Subsidiaries, or to the knowledge of Borrower, any of their Affiliates or 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. None of the funds to be provided under this Agreement shall be used, directly or indirectly, (a) for any activities in violation of any applicable anti-money laundering, economic sanctions and anti-bribery laws and regulations laws and regulations or (b) for any payment to any governmental official or employee, political party, official of a political party, candidate for political office, or anyone else acting in an official capacity, in order to obtain, retain or direct business or obtain any improper advantage, in violation of the United States Foreign Corrupt Practices Act of 1977, as amended.

g. Information Correct and Current. No information, report, Advance Request, financial statement, exhibit or schedule furnished, by or on behalf of Borrower to Agent in connection with any Loan Document or included therein or delivered pursuant thereto contained, or, when taken as a whole, contains, or shall contain, any material misstatement of fact or, when taken together with all other such information or documents, omitted, omits or shall omit to state any material fact necessary to make the statements therein, in the light of the circumstances under which they were, are or shall be made, not materially misleading at the time such statement was made or deemed made. Additionally, any and all financial or business projections provided by a Borrower to Agent, whether prior to or after the Closing Date, shall be (i) provided in good faith and based on the most current data and information available to Borrower, and (ii) the most current of such projections provided to Borrower's Board (it being understood that the projections and forecasts provided by Borrower in good faith and based upon reasonable assumptions are not viewed as facts, that such projections are subject to significant uncertainties and contingencies, many of which are beyond the control of Borrower, that no assurance is given that any particular projections will be realized, and that actual results during the period or periods covered by such projections and forecasts may differ from the projected or forecasted results).

h. Tax Matters. Except as set forth on Schedule 5.8, (a) Borrower and its Subsidiaries have filed all federal and state income Tax returns and other material Tax returns that they are required to file, (b) Borrower and its Subsidiaries have duly paid all federal and state income Taxes and other material Taxes or installments thereof that they are required to pay, except Taxes being contested in good faith by appropriate proceedings and for which Borrower and its Subsidiaries maintain adequate reserves in accordance with GAAP, and (c) to the best of Borrower's knowledge, no proposed or pending Tax assessments, deficiencies, audits or other proceedings with respect to Borrower or any Subsidiary have had, or could reasonably be expected to have, individually or in the aggregate, a Material Adverse Effect.

i. Intellectual Property Claims. Except for Permitted Liens, Borrower is the sole owner of, or otherwise has the right to use, the Intellectual Property material to Borrower's business. Except as described on Schedule 5.11, each of the material Copyrights, Trademarks and Patents is valid and enforceable, no material part of the Intellectual Property has been judged invalid or unenforceable, in whole or in part, and, to Borrower's knowledge, no claim has been made to Borrower that any material part of the Intellectual Property violates the rights of any third party. Exhibit C is a true, correct and complete list of each of Borrower's Patents, registered Trademarks, registered Copyrights, and material agreements under which Borrower licenses Intellectual Property from third parties (other than shrink-wrap software licenses), together with application or registration numbers, as applicable, owned by Borrower or any Subsidiary, in each case as of the Closing Date. Borrower is not in breach of, nor has Borrower

failed to perform any obligations under, any of the foregoing contracts, licenses or agreements, except as could not reasonably be expected to result, individually or in the aggregate, in a Material Adverse Effect and, to Borrower's knowledge, no third party to any such contract, license or agreement is in breach thereof or has failed to perform any obligations thereunder, except as could not reasonably be expected to result, individually or in the aggregate, in a Material Adverse Effect.

j. Intellectual Property.

i. Borrower has all material rights with respect to Intellectual Property necessary or material in the operation or conduct of Borrower's business as currently conducted and proposed to be conducted by Borrower. Without limiting the generality of the foregoing, and in the case of Licenses, except for restrictions that are unenforceable under Division 9 of the UCC or restrictions that are permitted hereunder, Borrower has the right, to the extent required to operate Borrower's business, to freely transfer, license or assign Intellectual Property owned by Borrower and necessary or material in the operation or conduct of Borrower's business as currently conducted and proposed to be conducted by Borrower, without condition, restriction or payment of any kind (other than license payments in the ordinary course of business) to any third party. Borrower owns or has the right to use, pursuant to valid licenses, all software development tools, library functions, compilers and all other third-party software and other items that are material to Borrower's business and used in the design, development, promotion, sale, license, manufacture, import, export, use or distribution of Products except customary covenants in license agreements, joint venture or strategic alliances (to the extent such joint ventures or strategic alliances are Permitted Investments) and equipment leases where Borrower is the licensee or lessee.

ii. No material software or other material materials used by Borrower or any of its Subsidiaries (or used in any Products or any Subsidiaries' products) are subject to an open-source or similar license (including but not limited to the General Public License, Lesser General Public License, Mozilla Public License, or Affero License) in a manner that would cause such software or other materials to have to be (i) distributed to third parties at no charge or a minimal charge (royalty-free basis); (ii) licensed to third parties to modify, make derivative works based on, decompile, disassemble, or reverse engineer; or (iii) used in a manner that does could require disclosure or distribution in source code form.

k. Products. Except as set forth on Schedule 5.11, no material Intellectual Property owned by Borrower or Product has been or is subject to any actual or, to the knowledge of Borrower, threatened litigation, proceeding (including any proceeding in the United States Patent and Trademark Office or any corresponding foreign office or agency) or outstanding decree, order, judgment, settlement agreement or stipulation that restricts in any manner Borrower's use, transfer or licensing thereof or that may affect the validity, use or enforceability thereof. There is no decree, order, judgment, agreement, stipulation, arbitral award or other provision entered into in connection with any litigation or proceeding that obligates Borrower to grant licenses or ownership interest in any future Intellectual Property related to the operation or conduct of the business of Borrower or Products. Borrower has not received any written notice or claim, or, to the knowledge of Borrower, oral notice or claim, challenging or questioning Borrower's ownership in any material Intellectual Property (or written notice of any claim challenging or questioning the ownership in any licensed Intellectual Property of the owner thereof) or suggesting that any third party has any claim of legal or beneficial ownership with respect thereto nor, to Borrower's knowledge, is there a reasonable basis for any such claim. To Borrower's knowledge, neither Borrower's use of its material Intellectual Property nor the production and sale of Products materially infringes the Intellectual Property or other rights of others.

l. Financial Accounts. Exhibit D, as may be updated by Borrower in a written notice provided to Agent after the Closing Date, is a true, correct and complete list of (a) all banks and other financial institutions at which Borrower or any Subsidiary maintains Deposit Accounts and (b) all institutions at which Borrower or any Subsidiary maintains an account holding Investment Property, and such exhibit correctly identifies the name, address and telephone number of each bank or other institution, the name in which the account is held, a description of the purpose of the account, and the complete account number therefor.

m. Employee Loans. Other than loans constituting Permitted Investments, Borrower has no outstanding loans to any employee, officer or director of Borrower nor has Borrower guaranteed the payment of any loan made to an employee, officer or director of Borrower by a third party.

n. Subsidiaries. Borrower does not own any stock, partnership interest or other securities of any Person, except for Permitted Investments. Attached as Schedule 5.14, as may be updated by Borrower in a written notice provided after the Closing Date, is a true, correct and complete list of each Subsidiary.

6.
INSURANCE; INDEMNIFICATION

a. Coverage. Borrower shall cause to be carried and maintained commercial general liability insurance covering Borrower and each of its Subsidiaries, on an occurrence form, against risks customarily insured against in Borrower's line of business. Such risks shall include the risks of bodily injury, including death, property damage, personal injury, advertising injury, and contractual liability per the terms of the indemnification agreement found in Section 6.3. Borrower shall maintain a minimum of $2,000,000 of commercial general liability insurance for each occurrence. Borrower maintains and shall continue to maintain a minimum of $2,000,000 of directors' and officers' insurance for each occurrence and $5,000,000 in the aggregate. So long as there any Secured Obligations outstanding, Borrower shall maintain insurance upon the business and assets of Borrower and its Subsidiaries, insuring against all risks of physical loss or damage howsoever caused, in an amount not less than the full replacement cost of the Collateral, provided that such insurance may be subject to standard exceptions and deductibles. . If Borrower fails to obtain the insurance called for by this Section 6.1 or fails to pay any premium thereon or fails to pay any other amount which Borrower is obligated to pay under this Agreement or any other Loan Document or which may be required to preserve the Collateral, Agent may obtain such insurance or make such payment, and all amounts so paid by Agent are immediately due and payable, bearing interest at the then highest rate applicable to the Secured Obligations, and secured by the Collateral. Agent will make reasonable efforts to provide Borrower with notice of Agent obtaining such insurance at the time it is obtained or within a reasonable time thereafter. No payments by Agent are deemed an agreement to make similar payments in the future or Agent's waiver of any Event of Default.

b. Certificates. Borrower shall deliver to Agent certificates of insurance that evidence compliance with its insurance obligations in Section 6.1 and the obligations contained in this Section 6.2. Borrower's insurance certificate shall reflect Agent (shown as "Hercules Capital, Inc., as Agent, and its successors and/or assigns") as an additional insured for commercial general liability, and a lenders loss payable for property insurance and additional insured for liability insurance for any future insurance that Borrower may acquire from such insurer. Attached to the certificates of insurance will be additional insured endorsements for liability and lender's loss payable endorsements for all risk property damage insurance. All certificates of insurance shall provide for a minimum of thirty (30) days' advance written notice to Agent of cancellation (other than cancellation for non-payment of premiums, for which ten (10) days' advance written notice shall be sufficient) or any other change adverse to Agent's interests. Any failure of Agent to scrutinize such insurance certificates for compliance is not a waiver of any of Agent's rights, all of which are reserved. Upon Agent's reasonable request, Borrower shall provide Agent with copies of each insurance policy, and upon entering or amending any insurance policy required hereunder, Borrower shall provide Agent with copies of such policies and shall promptly deliver to Agent updated insurance certificates with respect to such policies.

c. Indemnity. Borrower agrees to indemnify and hold Agent, Lenders and their officers, directors, employees, agents, in-house attorneys, representatives and shareholders (each, an "Indemnified Person") harmless from and against any and all claims, costs, expenses, damages and liabilities (including such claims, costs, expenses, damages and liabilities based on liability in tort, including strict liability in tort), including reasonable attorneys' fees and disbursements and other costs of investigation or defense (including those incurred upon any appeal) (collectively, "Liabilities"), that may be instituted or asserted against or incurred by such Indemnified Person as the result of credit having been extended, suspended or terminated under this Agreement and the other Loan Documents or the administration of such credit, or in connection with or arising out of the transactions contemplated hereunder and thereunder, or any actions or failures to act in connection therewith, or arising out of the disposition or

utilization of the Collateral, excluding in all cases Liabilities to the extent resulting solely from any Indemnified Person's gross negligence or willful misconduct. This Section 6.3 shall not apply with respect to Taxes other than any Taxes that represent losses, claims, damages, etc. arising from any non-Tax claim. In no event shall any Indemnified Person be liable on any theory of liability for any special, indirect, consequential or punitive damages (including any loss of profits, business or anticipated savings). This Section 6.3 shall survive the repayment of indebtedness under, and otherwise shall survive the expiration or other termination of, the Loan Agreement, in each case subject to the applicable statute of limitations.

7.
COVENANTS

Borrower agrees as follows:

a. Financial Reports. Borrower shall furnish to Agent the financial statements and reports listed hereinafter (the "Financial Statements"):

i. as soon as practicable (and in any event within 30 days) after the end of each month, unaudited interim and year-to-date financial statements as of the end of such month (prepared on a consolidated basis), including balance sheet and related statement of income accompanied by a report detailing any material contingencies (including the commencement of any material litigation by or against Borrower) or any other occurrence that could reasonably be expected to have a Material Adverse Effect, all certified by Borrower's Chief Executive Officer or Chief Financial Officer to the effect that they have been prepared in accordance with GAAP, (i) except for the absence of footnotes, (ii) subject to normal year-end adjustments, and (iii) except for certain non-cash items that are customarily included in quarterly and annual financial statements;

ii. as soon as practicable (and in any event within 45 days) after the end of each calendar quarter, unaudited interim and year-to-date financial statements as of the end of such calendar quarter (prepared on a consolidated basis, if applicable), including balance sheet and related statements of income and cash flows accompanied by a report detailing any material contingencies (including the commencement of any material litigation by or against Borrower) or any other occurrence that could reasonably be expected to have a Material Adverse Effect, certified by Borrower's Chief Executive Officer or Chief Financial Officer or another authorized executive of Borrower to the effect that they have been prepared in accordance with GAAP, (i) except for the absence of footnotes, and (ii) subject to normal year-end adjustments;

iii. as soon as practicable (and in any event within 90 days) after the end of each fiscal year, unqualified (other than as to going concern qualification) audited financial statements as of the end of such year (prepared on a consolidated and consolidating basis, if applicable), including balance sheet and related statements of income and cash flows, and setting forth in comparative form the corresponding figures for the preceding fiscal year, certified by a firm of independent certified public accountants selected by Borrower and reasonably acceptable to Agent, accompanied by any management report from such accountants;

iv. as soon as practicable (and in any event within 30 days) after the end of each month, a Compliance Certificate in the form of Exhibit E;

v. as soon as practicable (and in any event within 30 days) after the end of each month, a report showing agings of accounts receivable and accounts payable;

vi. promptly after the sending or filing thereof, as the case may be, copies of any proxy statements, financial statements or reports that Borrower has made available to holders of its preferred stock, and copies of any regular, periodic and special reports or registration statements that Borrower files with the Securities and Exchange Commission or any governmental authority that may be substituted therefor, or any national securities exchange;

vii. promptly following each meeting of the Board, copies of all presentation materials that Borrower provides to its directors in connection with meetings of the board of directors, provided that in all cases Borrower may exclude any information or materials related to executive compensation, confidential information, any attorney-client privileged information and any information that would raise a conflict of interest with Agent or Lenders;

viii. financial and business projections promptly following their approval by Borrower's Board, and in any event, 60 days after the end of Borrower's fiscal year, as well as budgets, operating plans and other financial information reasonably requested by Agent;

ix. insurance renewal statements, annually or otherwise upon promptly upon renewal of insurance policies required to be maintained in accordance with Section 6.1~~, and~~;

x. prompt (but in any event no more than 3 Business Days) notice if Borrower or any Subsidiary has knowledge that Borrower, or any Subsidiary or controlled Affiliate of Borrower, 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~~.~~; and

vi. prompt (but in any event no more than 4 Business Days) notice of (i) any new material collaboration agreement or license agreement to which Borrower or any Subsidiary is a party to, or any material amendment or modification thereto, or (ii) the occurrence of any event or circumstance giving rise to a right on the part of a counterparty to a material collaboration agreement or license agreement, to terminate or exercise other remedies or similar rights in lieu of termination following a breach by Borrower or any Subsidiary thereof.

Borrower shall not make any change in its (a) accounting policies or reporting practices (other than as permitted under GAAP or pursuant to applicable securities laws or regulations of the SEC), or (b) fiscal years or fiscal quarters. The fiscal year of Borrower shall end on December 31.

The executed Compliance Certificate, all Financial Statements required to be delivered pursuant to clauses (a), (b) and (c) above shall be sent via e-mail to financialstatements@htgc.com with a copy to legal@htgc.com and kkosofsky@htgc.com, provided, that if e-mail is not available or sending such Financial Statements via e-mail is not possible, they shall be faxed to Agent at: (650) 473-9194, attention Account Manager: Seres Therapeutics, Inc.

Notwithstanding the foregoing, documents required to be delivered hereunder (to the extent any such documents are included in materials otherwise filed with the SEC) may be delivered electronically and if so delivered, shall be deemed to have been delivered on the date on which Borrower makes such documents or materials publically available.

b. Management Rights. Borrower shall permit any representative that Agent or Lenders authorizes, including its attorneys and accountants, to inspect the Collateral and examine and make copies and abstracts of the books of account and records of Borrower at reasonable times and upon reasonable notice during normal business hours; provided, however, that so long as no Event of Default has occurred and is continuing, such examinations shall be limited to no more often than once per fiscal year. In addition, any such representative shall have the right to meet with management and officers of Borrower to discuss such books of account and records at reasonable times and upon reasonable notice. In addition, Agent or Lenders shall be entitled at reasonable times and intervals to consult with and advise the management and officers of Borrower concerning significant business issues affecting Borrower. Such consultations shall not unreasonably interfere with Borrower's business operations. The parties intend that the rights granted Agent and Lenders shall constitute "management rights" within the meaning of 29 C.F.R. Section 2510.3-101(d)(3)(ii), but that any advice, recommendations or participation by Agent or Lenders with respect to any business issues shall not be deemed to give Agent or any Lender, nor be deemed an exercise by Agent or any Lender of, control over Borrower's management or policies.

c. Further Assurances. Borrower shall, and shall cause each other Loan Party to, from time to time execute, deliver and file, alone or with Agent, any financing statements, security agreements, collateral assignments, notices, control agreements, promissory notes or other documents to perfect or give the highest priority to Agent's Lien on the Collateral or otherwise evidence Agent's rights herein, in each case as reasonably requested by Agent. Borrower shall, from time to time procure any instruments or documents as may be reasonably requested by Agent, and take all further action that may be necessary, or that Agent may reasonably request, to perfect and protect the Liens granted hereby or pursuant to applicable Loan Documents. In addition, and for such purposes only, Borrower hereby authorizes Agent to execute and deliver on behalf of Borrower and to file such financing statements (including an indication that the financing statement covers "all assets or all personal property" of Borrower in accordance with Section 9-504 of the UCC), without the signature of Borrower, either in Agent's name or in the name of Agent as agent and attorney-in-fact for Borrower. Borrower shall in good faith and in its reasonable commercial discretion, in each case subject to the terms of this Agreement, protect and defend its title to the Collateral and Agent's Lien thereon against all Persons claiming any interest adverse to Borrower or Agent other than Permitted Liens.

d. Indebtedness. Borrower shall not create, incur, assume, guarantee or be or remain liable with respect to any Indebtedness, and shall not permit any Subsidiary to do so, other than Permitted Indebtedness, or prepay any Indebtedness or take any actions which impose on Borrower an obligation to prepay any Indebtedness, except (a) for the conversion of Indebtedness into equity securities and the payment of cash in lieu of fractional shares in connection with such conversion, (b) for purchase money Indebtedness pursuant to its then applicable payment schedule or with other purchase money Indebtedness permitted hereunder, (c) for prepayment (i) by any Loan Party or Subsidiary of intercompany Indebtedness owed to Borrower, or (ii) by any Subsidiary that is not a Loan Party of intercompany Indebtedness owed by such Subsidiary to another Subsidiary that is not a Loan Party, or (d) as may be permitted under any Subordination Agreement, (e) as otherwise permitted hereunder or approved in writing by Agent, and (f) Permitted Indebtedness with the proceeds of other Permitted Indebtedness. ~~Notwithstanding anything to the contrary herein, so long as (i) no Event of Default has occurred and is continuing, (ii) Borrower has used commercially reasonable efforts to use the proceeds of the PPP Loan in a manner that allows for the maximum amount of forgiveness of Indebtedness under the PPP Loan and (iii) Borrower has made a timely request (and in any event, prior to the first amortization payment) to the lender under the PPP Loan for forgiveness of the maximum amount of Indebtedness eligible for forgiveness thereunder, then Borrower may make payments of principal and interest on the PPP Loan in accordance with the amortization schedule thereunder.~~

Notwithstanding anything to the contrary in the foregoing, the issuance of, performance of obligations under (including any payments of interest), and conversion, exercise, repurchase, redemption (including, for the avoidance of doubt, a required repurchase in connection with the redemption of Permitted Convertible Debt upon satisfaction of a condition related to the stock price of Borrower's common stock), settlement or early termination or cancellation of (whether in whole or in part and including by netting or set-off) (in each case, whether in cash, common stock of Borrower or, following a merger event or other change of the common stock of Borrower, other securities or property), or the satisfaction of any condition that would permit or require any of the foregoing, any Permitted Convertible Debt shall not constitute a prepayment of Indebtedness by Borrower for the purposes of this Section 7.4 provided that principal payments in cash (other than cash in lieu of fractional shares) shall only be allowed with respect to any repurchase in connection with the redemption of Permitted Convertible Debt upon satisfaction of a condition related to the stock price of Borrower's common stock if the Redemption Conditions are satisfied in respect of such redemption and at all times after such redemption.

e. Collateral. Borrower shall at all times keep the Collateral, the Intellectual Property and all other property and assets used in Borrower's business or in which Borrower now or hereafter holds any interest free and clear from Liens whatsoever (except for Permitted Liens), and shall give Agent prompt written notice of any legal process that is reasonably likely to result in damages, expenses or liabilities in excess of $~~500,000~~1,500,000 affecting the Collateral, the Intellectual Property, such other property or assets, or any Liens thereon, provided however, that the Collateral and such other property and assets may be subject to Permitted Liens except that there shall be no Liens whatsoever on Intellectual Property. Borrower shall not agree with any Person other than Agent or Lenders not to encumber its property other than in connection with Permitted Liens. Borrower shall not enter into or suffer to exist or become effective any agreement that prohibits or limits the ability of Borrower to create, incur,

assume or suffer to exist any Lien upon any of its property (including Intellectual Property), whether now owned or hereafter acquired, to secure its obligations under the Loan Documents to which it is a party other than (a) this Agreement and the other Loan Documents, (b) any agreements governing any purchase money Liens or capital lease obligations otherwise permitted hereby (in which case, any prohibition or limitation shall only be effective against the assets financed thereby) and (c) customary restrictions on the assignment of leases, licenses and other agreements. Borrower shall cause each of its Subsidiaries to protect and defend such Subsidiary's title to its assets from and against all Persons claiming any interest adverse to such Subsidiary, and Borrower shall cause each of its Subsidiaries at all times to keep such Subsidiary's property and assets free and clear from Liens whatsoever (except for Permitted Liens), and shall give Agent prompt written notice of any legal process that is reasonably likely to result in damages, expenses or liabilities in excess of $~~500,000~~1,500,000.

f. Investments. Borrower shall not, directly or indirectly acquire or own, or make any Investment in or to any Person, nor permit any of its Subsidiaries so to do, other than Permitted Investments.

Notwithstanding the foregoing, and for the avoidance of doubt, this Section 7.6 shall not prohibit the conversion by holders of (including any cash payment upon conversion), or required payment of any principal or premium on (including, for the avoidance of doubt, in respect of a required repurchase in connection with the redemption of Permitted Convertible Debt upon satisfaction of a condition related to the stock price of Borrower's common stock) or required payment of any interest with respect to, any Permitted Convertible Debt in each case, in accordance with the terms of the indenture governing such Permitted Convertible Debt, provided that principal payments in cash (other than cash in lieu of fractional shares) shall be allowed with respect to any repurchase in connection with the redemption of Permitted Convertible Debt upon satisfaction of a condition related to the stock price of Borrower's common stock only if the Redemption Conditions are satisfied in respect of such redemption and at all times after such redemption.~~.~~

Notwithstanding the foregoing, Borrower may repurchase, exchange or induce the conversion of Permitted Convertible Debt by delivery of shares of Borrower's common stock and/or a different series of Permitted Convertible Debt and/or by payment of cash (in an amount that does not exceed the proceeds received by Borrower from the substantially concurrent issuance of shares of Borrower's common stock and/or Permitted Convertible Debt plus the net cash proceeds, if any, received by Borrower pursuant to the related exercise or early unwind or termination of the related Permitted Bond Hedge Transactions and Permitted Warrant Transactions, if any, pursuant to the immediately following proviso); provided that, for the avoidance of doubt, substantially concurrently with, or a commercially reasonable period of time before or after, the related settlement date for the Permitted Convertible Debt that are so repurchased, exchanged or converted, Borrower may exercise or unwind or terminate early (whether in cash, shares or any combination thereof) the portion of the Permitted Bond Hedge Transactions and Permitted Warrant Transactions, if any, corresponding to such Permitted Convertible Debt that are so repurchased, exchanged or converted.

g. Distributions. Borrower shall not, nor shall it permit any Subsidiary to, (a) repurchase or redeem any class of stock or other Equity Interest other than repurchases described in clause (c) of the defined term "Permitted Investments"; (b) declare or pay any cash dividend or make a cash distribution on any class of stock or other Equity Interest, except that a Subsidiary of Borrower may pay dividends or make distributions to Borrower or a Subsidiary of Borrower; (c) lend money to any employees, officers or directors or guarantee the payment of any such loans granted by a third party in excess of $~~500,000~~1,500,000 in the aggregate; or (d) waive, release or forgive any Indebtedness owed by any employees, officers or directors in excess of $~~500,000~~1,500,000 in the aggregate.

Notwithstanding the foregoing, and for the avoidance of doubt, this Section 7.7 shall not prohibit (i) the conversion by holders of (including any cash payment upon conversion), or required payment of any principal or premium on (including, for the avoidance of doubt, in respect of a required repurchase in connection with the redemption of Permitted Convertible Debt upon satisfaction of a condition related to the stock price of Borrower's common stock) or required payment of any interest with respect to, any Permitted Convertible Debt in each case, in accordance with the terms of the indenture governing such Permitted Convertible Debt or (ii) the entry into (including the payment of premiums in connection therewith) or any required payment with respect to, or required early unwind or settlement of, any Permitted Bond Hedge Transaction or Permitted Warrant Transaction, in each

case, in accordance with the terms of the agreement governing such Permitted Bond Hedge Transaction or Permitted Warrant Transaction.

Notwithstanding the foregoing, Borrower may repurchase, exchange or induce the conversion of Permitted Convertible Debt by delivery of shares of Borrower's common stock and/or a different series of Permitted Convertible Debt and/or by payment of cash (in an amount that does not exceed the proceeds received by Borrower from the substantially concurrent issuance of shares of Borrower's common stock and/or Refinancing Convertible Notes plus the net cash proceeds, if any, received by Borrower pursuant to the related exercise or early unwind or termination of the related Permitted Bond Hedge Transactions and Permitted Warrant Transactions, if any, pursuant to the immediately following proviso); provided that, for the avoidance of doubt, substantially concurrently with, or a commercially reasonable period of time before or after, the related settlement date for the Permitted Convertible Debt that are so repurchased, exchanged or converted, Borrower may exercise or unwind or terminate early (whether in cash, shares or any combination thereof) the portion of the Permitted Bond Hedge Transactions and Permitted Warrant Transactions, if any, corresponding to such Permitted Convertible Debt that are so repurchased, exchanged or converted.

h. Transfers. Except for Permitted Transfers, Borrower shall not, and shall not permit any Subsidiary to, voluntarily or involuntarily transfer, sell, lease, license, lend or in any other manner convey any equitable, beneficial or legal interest in any material portion of its assets (including Cash).

i. Mergers or Acquisitions. Borrower shall not merge or consolidate, nor permit any of its Subsidiaries to merge or consolidate, with or into any other business organization, other than mergers or consolidations of (a) a Subsidiary which is not a Loan Party into another Subsidiary or into a Loan Party, or (b) a Loan Party into another Loan Party (provided that Borrower shall be the surviving entity in any transaction involving Borrower), or acquire, or permit any of its Subsidiaries to acquire, in each case including for the avoidance of doubt through a merger, purchase, in-licensing arrangement or any similar transaction, all or substantially all of the capital stock or property of another Person, provided however, that Borrower shall be permitted to enter into Permitted Acquisitions.

j. Taxes. Borrower shall, and shall cause each of its Subsidiaries to, pay when due all material Taxes of any nature whatsoever now or hereafter imposed or assessed against Borrower or such Subsidiary or the Collateral or upon Borrower's (or such Subsidiary's) ownership, possession, use, operation or disposition thereof or upon Borrower's (or such Subsidiary's) rents, receipts or earnings arising therefrom. Borrower shall, and shall cause each of its Subsidiaries to accurately file on or before the due date therefor (taking into account proper extensions) all federal and state income Tax returns and other material Tax returns required to be filed. Notwithstanding the foregoing, Borrower and its Subsidiaries may contest, in good faith and by appropriate proceedings diligently conducted, Taxes for which Borrower and its Subsidiaries maintain adequate reserves in accordance with GAAP.

k. Certain Changes. Neither Borrower nor any Subsidiary shall change its jurisdiction of organization, organizational form or legal name without twenty (20) days' prior written notice to Agent. Neither Borrower nor any Subsidiary shall suffer a Change in Control. Neither Borrower nor any Subsidiary shall relocate its chief executive office or its principal place of business unless: (i) it has provided prior written notice to Agent; and (ii) such relocation shall be within the continental United States of America. Neither Borrower nor any Subsidiary shall relocate any item of Collateral (other than (x) sales of Inventory in the ordinary course of business, (y) relocations of Equipment within the United States having an aggregate value of up to $~~1,500,000~~2,500,000 in any fiscal year, and (z) relocations of Collateral from a location described ~~on Exhibit B~~in the Perfection Certificate to another location described ~~on Exhibit B~~therein) unless (i) it has provided prompt written notice to Agent, (ii) such relocation is within the continental United States of America and, (iii) if such relocation is to a third party bailee, it has used commercially reasonable efforts to deliver a bailee agreement in form and substance reasonably acceptable to Agent.

l. Deposit Accounts. Subject to Section 4.4, other than Excluded Accounts, neither Borrower nor any Subsidiary (other than an Excluded Subsidiary) shall maintain any Deposit Accounts, or accounts holding Investment Property, except with respect to which Agent has an Account Control Agreement.

m. Joinder of Subsidiaries; Limitation on Foreign Subsidiaries. Borrower shall notify Agent of each Subsidiary formed subsequent to the Closing Date and, within 20 days of formation, shall cause any such Domestic Subsidiary (other than an Excluded Subsidiary) to execute and deliver to Agent a Joinder Agreement, or, if requested by Agent, a Guaranty and appropriate collateral security documents to secure the obligations pursuant to such Guaranty. Borrower shall not permit Foreign Subsidiaries to maintain Cash balances in excess of $~~500,000~~1,500,000 at any time.

n. MSC Investment Conditions. At any time that the MSC Subsidiary holds any Cash, Borrower shall satisfy the MSC Investment Conditions at all times.

o. Notification of Event of Default. Borrower shall notify Agent promptly, in any event within three (3) Business Days, of the occurrence of any Event of Default.

p. SBA Addendum. One or more affiliates of Agent have received a license from the U.S. Small Business Administration ("SBA") to extend loans as a small business investment company ("SBIC") pursuant to the Small Business Investment Act of 1958, as amended, and the associated regulations (collectively, the "SBIC Act"). Portions of the Loan to Borrower may be made by a Lender that is an SBIC. Addendum 2 to this Agreement outlines various responsibilities of Agent, each Lender and Borrower associated with a loan made by an SBIC, and such Addendum 2 is hereby incorporated in this Agreement.

q. Use of Proceeds. Borrower agrees that the proceeds of the Loans shall be used solely to pay related fees and expenses in connection with this Agreement and for working capital and general business purposes. The proceeds of the Loans shall not be used in violation of Anti-Corruption Laws or applicable Sanctions.

r. Compliance with Laws.

i. Borrower shall maintain, and shall cause each of its Subsidiaries to maintain compliance in all material respects with all applicable laws, rules or regulations, and shall, or cause its Subsidiaries to, obtain and maintain all required governmental authorizations, approvals, licenses, franchises, permits or registrations reasonably necessary in connection with the conduct of Borrower's business. Borrower shall not become an "investment company" or a company controlled by 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 X, T and U of the Federal Reserve Board of Governors).

ii. Neither Borrower nor any of its Subsidiaries shall, nor shall Borrower or any of its Subsidiaries permit any controlled Affiliate to, directly or indirectly, knowingly enter into any documents, instruments, agreements or contracts with any Person listed on the OFAC Lists. Neither Borrower nor any of its Subsidiaries shall, nor shall Borrower or any of its Subsidiaries permit any controlled Affiliate to, directly or indirectly, (i) 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, (ii) 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 (iii) 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.

iii. Borrower has implemented and shall maintain in effect policies and procedures designed to reasonably ensure compliance by Borrower and its Subsidiaries and their respective directors, officers, employees and agents with Anti-Corruption Laws and applicable Sanctions, and Borrower and its Subsidiaries and their respective officers and employees and to the knowledge Borrower, its directors and agents, are in compliance with Anti-Corruption Laws and applicable Sanctions in all material respects

iv. Neither Borrower nor its Subsidiaries nor any of their respective directors, officers or employees, or to the knowledge of Borrower, any agent for Borrower or any of its Subsidiaries that shall act in any capacity in connection with or benefit from the credit facility established hereby, is a Sanctioned Person. No Loan, use of proceeds or other transaction contemplated by this Agreement shall violate Anti-Corruption Laws or applicable Sanctions.

s. Financial Covenant – Minimum Cash.

vii. If the Regulatory Approval Milestone has not been achieved on or prior to June 15, 2023, then on June 15, 2023 and at all times thereafter until the Regulatory Approval Milestone has been achieved, Borrower shall maintain Unrestricted Cash in an amount not less than $35,000,000, provided that if the Regulatory Approval Milestone is achieved, the foregoing covenant shall permanently cease to apply.

~~(a) On the earlier of (i) October 31, 2020 (or if Performance Milestone I has been achieved, December 31, 2020) or (ii) the date of the announcement of Phase 2b ECORESET data and at all times thereafter, Borrower shall maintain Unrestricted Cash in amounts not less than the applicable amount, determined by reference to the schedule below:~~

~~Milestones Achieved~~	~~Minimum Cash Required~~
~~Performance Milestone I achieved; Performance Milestone II achieved~~	~~$0~~
~~Performance Milestone I failed; Performance Milestone II achieved~~	~~$10,000,000~~
~~Performance Milestone I achieved; Performance Milestone II failed~~	~~$12,500,000~~
~~Performance Milestone I failed; Performance Milestone II failed~~	~~$20,000,000~~

~~Notwithstanding the foregoing, for so long as Borrower's Market Capitalization is greater than $350,000,000, this Section 7.19(a) shall not apply.~~

i. In the event Borrower makes a redemption or other cash payment in respect of Permitted Convertible Debt subject to satisfaction of the Redemption Conditions, or enters into a license agreement constituting a Permitted Transfer in accordance with clause (b)(iv)(B) of the defined term "Permitted Transfer", Borrower shall maintain Unrestricted Cash at all times in the amount required by the defined term "Redemption Conditions" or clause (b)(iv)(B) of the defined term "Permitted Transfer", at all times.

t. Intellectual Property. Borrower shall (i) protect, defend and maintain the validity and enforceability of its Intellectual Property in its good faith business judgment; (ii) promptly advise Agent in writing of material infringements of its Material Intellectual Property; and (iii) not allow any Material Intellectual Property material to Borrower's business to be abandoned, forfeited or dedicated to the public without Agent's written consent.

u. Transactions with Affiliates. Borrower shall not, and shall not permit any Subsidiary to, directly or indirectly, enter into or permit to exist any transaction of any kind with any Affiliate of Borrower or such Subsidiary on terms that are less favorable to Borrower or such Subsidiary, as the case may be, than those that might be obtained in an arm's length transaction from a Person who is not an Affiliate of Borrower or such Subsidiary, other

than (a) any equity investments in Borrower by existing investors of Borrower not constituting a Change of Control, or Subordinated Indebtedness, (b) any compensation, director indemnification or similar arrangements in the ordinary course of business of Borrower and as approved by Borrower's Board, (c) any intercompany arrangements entered into in the ordinary course of business and not prohibited hereunder, or (d) any transaction otherwise permitted under this Article 7.

8.
[RESERVED.]

9.
EVENTS OF DEFAULT

The occurrence of any one or more of the following events shall be an Event of Default:

a. Payments. A Loan Party fails to (a) pay principal or interest on any Loan on its due date or (b) pay any other Secured Obligations within three (3) Business Days after the applicable due date; provided, however, that, in each case, an Event of Default shall not occur on account of a failure to pay due solely to an administrative or operational error of Agent or Lenders or Borrower's bank if Borrower had the funds to make the payment when due and makes the payment within three (3) Business Days following Borrower's knowledge of such failure to pay; or

b. Covenants. A Loan Party breaches or defaults in the performance of any covenant or Secured Obligation under this Agreement, or any of the other Loan Documents or any other agreement among any Loan Party, Agent and Lenders, and (a) with respect to a default under any covenant under this Agreement other than the Sections specifically identified in clause (b) hereof, any other Loan Document or any other agreement between any Loan Party and Agent or Lenders, and such default continues for more than fifteen (15) Business Days after the earlier of the date on which (i) Agent or Lenders has given notice of such default to Borrower and (ii) Borrower has actual knowledge of such default (provided that, with respect to a default due to a failure to comply with Section 7.12 with respect to any new account, Borrower shall be deemed to have knowledge of the default as of the time such account is opened) or (b) with respect to a default under any of Sections 4.4, 6, 7.1, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 7.14, 7.15, 7.17, 7.18, 7.19, 7.20 and 7.21, the occurrence of such default; or

c. Material Adverse Effect. A circumstance has occurred that could reasonably be expected to have a Material Adverse Effect; provided that the failure to achieve ~~Performance~~Regulatory Approval Milestone ~~I or Performance Milestone II~~ shall not in and of itself constitute a Material Adverse Effect under this Section 9.3; or

d. Representations. Any representation or warranty made by any Loan Party in any Loan Document, when taken as a whole, shall have been false or misleading in any material respect when made or when deemed made; or

e. Insolvency. Any Loan Party (i) (A) shall make an assignment for the benefit of creditors; or (B) shall be unable to pay its debts as they become due; or (C) shall file a voluntary petition in bankruptcy; or (D) shall file any petition, answer, or document seeking for itself any reorganization, arrangement, composition, readjustment, liquidation, dissolution or similar relief under any present or future statute, law or regulation pertinent to such circumstances; or (E) shall seek or consent to or acquiesce in the appointment of any trustee, receiver, or liquidator of any Loan Party or of all or any substantial part (i.e. 33-1/3% or more) of the assets or property of any Loan Party; or (F) shall cease operations of its business as its business has normally been conducted, or terminate substantially all of its employees; or (G) any Loan Party or its directors or a majority of the holders of its Equity Interests shall take any action initiating any of the foregoing actions described in clauses (A) through (F); or (ii) either (A) forty-five (45) days shall have expired after the commencement of an involuntary action against any Loan Party seeking reorganization, arrangement, composition, readjustment, liquidation, dissolution or similar relief under any present or future statute, law or regulation, without such action being dismissed or all orders or proceedings thereunder affecting the operations or the business of any Loan Party being stayed; or (B) a stay of any such order or proceedings shall thereafter be set aside and the action setting it aside shall not be timely appealed; or (C) any Loan Party shall file any answer admitting or not contesting the material allegations of a petition filed against such Loan Party in any such proceedings; or (D) the court in which such proceedings are pending shall enter a decree or order

granting the relief sought in any such proceedings; or (E) forty-five (45) days shall have expired after the appointment, without the consent or acquiescence of any Loan Party, of any trustee, receiver or liquidator of such Loan Party or of all or any part of the properties of such Loan Party without such appointment being vacated; or

f. Attachments; Judgments. Any portion of any Loan Party's assets in aggregate value of $~~500,000~~1,500,000 or more, is attached or seized, or a levy is filed against any such assets, or a judgment or judgments is/are entered for the payment of money (not covered by independent third party insurance as to which liability has not been rejected by such insurance carrier) individually or in the aggregate, of at least $~~500,000~~1,500,000, or any Loan Party is enjoined or in any way prevented by court order from conducting any part of its business; or

g. Other Obligations. The occurrence of any default under any agreement or obligation of any Loan Party involving any Indebtedness in excess of $~~500,000~~1,500,000, or any early payment is required or unwinding or termination occurs with respect to any Permitted Bond Hedge Transaction and Permitted Warrant Transaction, or any condition giving rise to the foregoing is met, in each case, with respect to which Borrower or its Affiliates is the "defaulting party" under the terms of such Permitted Bond Hedge Transaction or Permitted Warrant Transaction.

10.
REMEDIES

a. General. Upon and during the continuance of any one or more Events of Default, Agent may, and at the direction of the Required Lenders shall, accelerate and demand payment of all or any part of the Secured Obligations together with a Prepayment Charge and declare them to be immediately due and payable (provided, that upon the occurrence of an Event of Default of the type described in Section 9.5, all of the Secured Obligations (including, without limitation, the Prepayment Charge and the End of Term Charge) shall automatically be accelerated and made due and payable, in each case without any further notice or act). Borrower hereby irrevocably appoints Agent as its lawful attorney-in-fact to: exercisable following the occurrence of an Event of Default, (i) sign Borrower's name on any invoice or bill of lading for any account or drafts against account debtors; (ii) demand, collect, sue, and give releases to any account debtor for monies due, settle and adjust disputes and claims about the accounts directly with account debtors, and compromise, prosecute, or defend any action, claim, case, or proceeding about any Collateral (including filing a claim or voting a claim in any bankruptcy case in Agent's or Borrower's name, as Agent may elect); (iii) make, settle, and adjust all claims under Borrower's insurance policies; (iv) pay, contest or settle any Lien, charge, encumbrance, security interest, or other claim in or to the Collateral, or any judgment based thereon, or otherwise take any action to terminate or discharge the same; (v) transfer the Collateral into the name of Agent or a third party as the UCC permits; and (vi) receive, open and dispose of mail addressed to Borrower. Borrower hereby appoints Agent as its lawful attorney-in-fact to sign Borrower's name on any documents necessary to perfect or continue the perfection of Agent's security interest in the Collateral regardless of whether an Event of Default has occurred until all Secured Obligations have been satisfied in full and the Loan Documents have been terminated. Agent's foregoing appointment as Borrower's attorney in fact, and all of Agent's rights and powers, coupled with an interest, are irrevocable until all Secured Obligations have been fully repaid and performed and the Loan Documents have been terminated. Agent may, and at the direction of the Required Lenders shall, exercise all rights and remedies with respect to the Collateral under the Loan Documents or otherwise available to it under the UCC and other applicable law, including the right to release, hold, sell, lease, liquidate, collect, realize upon, or otherwise dispose of all or any part of the Collateral and the right to occupy, utilize, process and commingle the Collateral. All Agent's rights and remedies shall be cumulative and not exclusive.

b. Collection; Foreclosure. Upon the occurrence and during the continuance of any Event of Default, Agent may, and at the direction of the Required Lenders shall, at any time or from time to time, apply, collect, liquidate, sell in one or more sales, lease or otherwise dispose of, any or all of the Collateral, in its then condition or following any commercially reasonable preparation or processing, in such order as Agent may elect. Any such sale may be made either at public or private sale at its place of business or elsewhere. Borrower agrees that any such public or private sale may occur upon ten (10) calendar days' prior written notice to Borrower. Agent may require Borrower to assemble the Collateral and make it available to Agent at a place designated by Agent that is reasonably

convenient to Agent and Borrower. The proceeds of any sale, disposition or other realization upon all or any part of the Collateral shall be applied by Agent in the following order of priorities:

First, to Agent and Lenders in an amount sufficient to pay in full Agent's and Lenders' reasonable costs and professionals' and advisors' fees and expenses as described in Section 11.11;

Second, to Lenders, ratably, in an amount equal to the then unpaid amount of the Secured Obligations (including principal, interest, subject to increase in accordance with Section 2.3), in such order and priority as Agent may choose in its sole discretion; and

Finally, after the full and final payment in Cash of all of the Secured Obligations (other than inchoate obligations), to any creditor holding a junior Lien on the Collateral, or to Borrower or its representatives or as a court of competent jurisdiction may direct.

Agent shall be deemed to have acted reasonably in the custody, preservation and disposition of any of the Collateral if it complies with the obligations of a secured party under the UCC.

c. No Waiver. Agent shall be under no obligation to marshal any of the Collateral for the benefit of Borrower or any other Person, and Borrower expressly waives all rights, if any, to require Agent to marshal any Collateral.

d. Waivers. Borrower waives 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 Agent on which Borrower is liable.

e. Cumulative Remedies. The rights, powers and remedies of Agent hereunder shall be in addition to all rights, powers and remedies given by statute or rule of law and are cumulative. The exercise of any one or more of the rights, powers and remedies provided herein shall not be construed as a waiver of or election of remedies with respect to any other rights, powers and remedies of Agent.

11.
MISCELLANEOUS

a. Severability. Whenever possible, each provision of this Agreement shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Agreement shall be prohibited by or invalid under such law, such provision shall be ineffective only to the extent and duration of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Agreement.

b. Notice. Except as otherwise provided herein, any notice, demand, request, consent, approval, declaration, service of process or other communication (including the delivery of Financial Statements) that is required, contemplated, or permitted under the Loan Documents or with respect to the subject matter hereof shall be in writing, and shall be deemed to have been validly served, given, delivered, and received upon the earlier of: (i) the day of transmission by electronic mail or hand delivery or delivery by an overnight express service or overnight mail delivery service; or (ii) the third calendar day after deposit in the United States of America mails, with proper first class postage prepaid, in each case addressed to the party to be notified as follows:

i. If to Agent:

HERCULES CAPITAL, INC.
Legal Department
Attention: Chief Legal Officer and Kristen Kosofsky
400 Hamilton Avenue, Suite 310
Palo Alto, CA 94301

email: legal@htgc.com; kkosofsky@htgc.com
Telephone: 650-289-3060

ii. If to Lenders:

HERCULES CAPITAL, INC.
Legal Department
Attention: Chief Legal Officer and Kristen Kosofsky
400 Hamilton Avenue, Suite 310
Palo Alto, CA 94301

email: legal@htgc.com; kkosofsky@htgc.com
Telephone: 650-289-3060

iii. If to Borrower:

Seres Therapeutics, Inc.
Attention: Thomas J. DesRosier, Chief Legal Officer
200 Sidney Street
Cambridge, MA 02139

email: tdesrosier@serestherapeutics.com
Telephone: 617-945-9626

with a copy to

Latham & Watkins LLP
Attention: ~~Haim Zaltzman~~Peter N. Handrinos
~~505 Montgomery~~200 Clarendon Street
Boston, MA 02116

~~Suite 2000~~
~~San Francisco, CA 94111-6538~~

Email: ~~haim.zaltzman~~peter.handrinos@lw.com
Telephone: ~~415-395-8870~~617-948-6060

or to such other address as each party may designate for itself by like notice.

c. Entire Agreement; Amendments.

i. This Agreement and the other Loan Documents constitute the entire agreement and understanding of the parties hereto in respect of the subject matter hereof and thereof, and supersede and replace in their entirety any prior proposals, term sheets, non-disclosure or confidentiality agreements, letters, negotiations or other documents or agreements, whether written or oral, with respect to the subject matter hereof or thereof (including Agent's proposal letter dated September 19, 2019 and accepted by Borrower on September 25, 2019 and the Non-Disclosure Agreement).

ii. Neither this Agreement, any other Loan Document, nor any terms hereof or thereof may be amended, supplemented or modified except in accordance with the provisions of this Section 11.3(b). The Required Lenders and Loan Parties party to the relevant Loan Document may, or, with the written consent of the Required Lenders, Agent and Loan Parties party to the relevant Loan Document may, from time to time, (i) enter into written amendments, supplements or modifications hereto and to the other Loan Documents for the purpose of adding any provisions to this Agreement or the other Loan Documents or

changing in any manner the rights of Lenders or of Loan Parties hereunder or thereunder or (ii) waive, on such terms and conditions as the Required Lenders or Agent, as the case may be, may specify in such instrument, any of the requirements of this Agreement or the other Loan Documents or any default or Event of Default and its consequences; provided, however, that no such waiver and no such amendment, supplement or modification shall (A) forgive the principal amount or extend the final scheduled date of maturity of any Loan, extend the scheduled date of any amortization payment in respect of any Term Loan Advance, reduce the stated rate of any interest or fee payable hereunder, or extend the scheduled date of any payment thereof, in each case without the written consent of each Lender directly affected thereby; (B) eliminate or reduce the voting rights of any Lender under this Section 11.3(b) without the written consent of such Lender; (C) reduce any percentage specified in the definition of Required Lenders, consent to the assignment or transfer by Loan Parties of any of its rights and obligations under this Agreement and the other Loan Documents, release all or substantially all of the Collateral or release a Loan Party from its obligations under the Loan Documents, in each case without the written consent of all Lenders; or (D) amend, modify or waive any provision of Section 11.17 without the written consent of Agent. Any such waiver and any such amendment, supplement or modification shall apply equally to each Lender and shall be binding upon the applicable Loan Parties, Lenders, Agent and all future holders of the Loans.

d. No Strict Construction. The parties hereto have participated jointly in the negotiation and drafting of this Agreement. In the event an ambiguity or question of intent or interpretation arises, this Agreement shall be construed as if drafted jointly by the parties hereto and no presumption or burden of proof shall arise favoring or disfavoring any party by virtue of the authorship of any provisions of this Agreement.

e. No Waiver. The powers conferred upon Agent and Lenders by this Agreement are solely to protect their rights hereunder and under the other Loan Documents and their interest in the Collateral and shall not impose any duty upon Agent or Lenders to exercise any such powers. No omission or delay by Agent or Lenders at any time to enforce any right or remedy reserved to them, or to require performance of any of the terms, covenants or provisions hereof by Borrower at any time designated, shall be a waiver of any such right or remedy to which Agent or Lenders is entitled, nor shall it in any way affect the right of Agent or Lenders to enforce such provisions thereafter.

f. Survival. All agreements, representations and warranties contained in this Agreement and the other Loan Documents or in any document delivered pursuant hereto or thereto shall be for the benefit of Agent, Lenders and Borrower, as applicable, and shall survive the execution and delivery of this Agreement. Sections 6.3, 11.8, 11.9, 11.10, 11.14, 11.15 and 11.17, shall survive the termination of this Agreement.

g. Successors and Assigns. The provisions of this Agreement and the other Loan Documents shall inure to the benefit of and be binding on Borrower and its permitted assigns (if any). No Loan Party shall assign its obligations under this Agreement or any of the other Loan Documents without Agent's express prior written consent, and any such attempted assignment shall be void and of no effect. Agent and Lenders may assign, transfer, or endorse its rights hereunder and under the other Loan Documents without prior notice to Borrower, and all of such rights shall inure to the benefit of Agent's and Lenders' successors and assigns; provided that as long as no Event of Default has occurred and is continuing, neither Agent nor any Lenders may assign, transfer or endorse its rights hereunder or under the Loan Documents to any party that is a direct competitor of Borrower or a distressed debt or vulture fund (as reasonably determined by Agent), it being acknowledged that in all cases, any transfer to a controlled Affiliate of any Lenders or Agent shall be allowed. 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 Agent and Lenders may assign, transfer or indorse its rights hereunder and under the other Loan Documents to any Person or party and (y) in connection with a Lender's own financing or securitization transactions, the restrictions set forth herein shall not apply and Agent and Lenders may assign, transfer or indorse its rights hereunder and under the other Loan Documents to 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 Agent shall have received and accepted an effective assignment agreement from such Person or party in form satisfactory to Agent executed, delivered and fully completed by the applicable parties thereto, and shall have received such other information regarding such assignee as Agent reasonably shall require. Agent, acting solely for this purpose as an agent of Borrower, shall maintain at one of its offices in the United States a register for the recordation of the names and addresses of Lender(s), Term Commitments of, and principal amounts (and stated interest) of the 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, Agent and Lender 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.

h. Governing Law. This Agreement and the other Loan Documents have been negotiated and delivered to Agent and Lenders in the State of California, and shall have been accepted by Agent and Lenders in the State of California. Payment to Agent and Lenders by Borrower of the Secured Obligations is due in the State of California. This Agreement and the other Loan Documents shall be governed by, and construed and enforced in accordance with, the laws of the State of California, excluding conflict of laws principles that would cause the application of laws of any other jurisdiction.

i. Consent to Jurisdiction and Venue. All judicial proceedings (to the extent that the reference requirement of Section 11.10 is not applicable) arising in or under or related to this Agreement or any of the other Loan Documents may be brought in any state or federal court located in the State of California. By execution and delivery of this Agreement, each party hereto generally and unconditionally: (a) consents to nonexclusive personal jurisdiction in Santa Clara County, State of California; (b) waives any objection as to jurisdiction or venue in Santa Clara County, State of California; (c) agrees not to assert any defense based on lack of jurisdiction or venue in the aforesaid courts; and (d) irrevocably agrees to be bound by any judgment rendered thereby in connection with this Agreement or the other Loan Documents. Service of process on any party hereto in any action arising out of or relating to this Agreement shall be effective if given in accordance with the requirements for notice set forth in Section 11.2, and shall be deemed effective and received as set forth in Section 11.2. Nothing herein shall affect the right to serve process in any other manner permitted by law or shall limit the right of either party to bring proceedings in the courts of any other jurisdiction.

j. Mutual Waiver of Jury Trial / Judicial Reference.

i. Because disputes arising in connection with complex financial transactions are most quickly and economically resolved by an experienced and expert Person and the parties wish applicable state and federal laws to apply (rather than arbitration rules), the parties desire that their disputes be resolved by a judge applying such applicable laws. EACH OF BORROWER AGENT AND LENDERS SPECIFICALLY WAIVES ANY RIGHT IT MAY HAVE TO TRIAL BY JURY OF ANY CAUSE OF ACTION, CLAIM, CROSS-CLAIM, COUNTERCLAIM, THIRD PARTY CLAIM OR ANY OTHER CLAIM (COLLECTIVELY, "CLAIMS") ASSERTED BY BORROWER AGAINST AGENT, LENDERS OR THEIR RESPECTIVE ASSIGNEE OR BY AGENT, LENDERS OR THEIR RESPECTIVE ASSIGNEE AGAINST BORROWER. This waiver extends to all such Claims, including Claims that involve Persons other than Agent, Borrower or any Lenders; Claims that arise out of or are in any way connected to the relationship among Borrower, Agent and Lenders; and any Claims for damages, breach of contract, tort, specific performance, or any equitable or legal relief of any kind, arising out of this Agreement, any other Loan Document.

ii. If the waiver of jury trial set forth in Section 11.10(a) is ineffective or unenforceable, the parties agree that all Claims shall be resolved by reference to a private judge sitting without a jury, pursuant to Code of Civil Procedure Section 638, before a mutually acceptable referee or, if the parties cannot agree, a referee selected by the Presiding Judge of the Santa Clara County, California. Such proceeding shall be conducted in Santa Clara County, California, with California rules of evidence and discovery applicable to such proceeding.

iii. In the event Claims are to be resolved by judicial reference, either party may seek from a court identified in Section 11.9, any prejudgment order, writ or other relief and have such prejudgment order, writ or other relief enforced to the fullest extent permitted by law notwithstanding that all Claims are otherwise subject to resolution by judicial reference.

k. Professional Fees. Borrower promises to pay Agent's and Lenders' reasonable fees and expenses necessary to finalize the loan documentation, including but not limited to reasonable attorneys' fees, UCC searches, filing costs, and other miscellaneous expenses, provided that the Due Diligence Fee shall be applied in its entirety to the Lenders' non-legal transaction costs and due diligence expenses. In addition, Borrower promises to pay any and all reasonable attorneys' and other professionals' fees and expenses incurred by Agent and Lenders after the Closing Date in connection with or related to: (a) the Loan; (b) the administration, collection, or enforcement of the Loan; (c) the amendment or modification of the Loan Documents; (d) any waiver, consent, release, or termination under the Loan Documents; (e) the protection, preservation, audit, field exam, sale, lease, liquidation, or disposition of Collateral or the exercise of remedies with respect to the Collateral; (f) any legal, litigation, administrative, arbitration, or out of court proceeding in connection with or related to Borrower or the Collateral, and any appeal or review thereof; and (g) any bankruptcy, restructuring, reorganization, assignment for the benefit of creditors, workout, foreclosure, or other action related to Borrower, the Collateral, the Loan Documents, including representing Agent or Lenders in any adversary proceeding or contested matter commenced or continued by or on behalf of Borrower's estate, and any appeal or review thereof.

l. Confidentiality. Agent and Lenders acknowledge that certain items of Collateral and information provided to Agent and Lenders by Borrower are confidential and proprietary information of Borrower, if and to the extent such information either (i) is marked as confidential by Borrower at the time of disclosure, or (ii) should reasonably be understood to be confidential (the "Confidential Information"). Accordingly, Agent and Lenders agree that any Confidential Information it may obtain in the course of acquiring, administering, or perfecting Agent's security interest in the Collateral shall not be disclosed to any other Person or entity in any manner whatsoever, in whole or in part, without the prior written consent of Borrower, except that Agent and Lenders may disclose any such information: (a) to its Affiliates and its partners, investors, lenders, directors, officers, employees, agents, advisors, accountants, counsel, representative and other professional advisors if Agent or Lenders in their reasonable discretion determines that any such party should have access to such information in connection with such party's responsibilities in connection with the Loan or this Agreement and, provided that such recipient of such Confidential Information either (i) agrees to be bound by the confidentiality provisions of this paragraph or (ii) is otherwise subject to confidentiality restrictions that reasonably protect against the disclosure of Confidential Information pursuant to similar terms; (b) if such information is generally available to the public or to the extent such information becomes publicly available other than as a result of a breach of this Section or becomes available to Agent or any Lender, or any of their respective Affiliates on a non-confidential basis from a source other than Borrower and not in violation of any confidentiality obligations known to the Agent or such Lender; (c) if required or appropriate in any report, statement or testimony submitted to any governmental authority having or claiming to have jurisdiction over Agent or Lenders and any rating agency; (d) if required or appropriate in response to any summons or subpoena or in connection with any litigation, to the extent permitted or deemed advisable by Agent's or Lenders' counsel; (e) to comply with any legal requirement or law applicable to Agent or Lenders or demanded by any governmental authority; (f) to the extent reasonably necessary in connection with the exercise of, or preparing to exercise, or the enforcement of, or preparing to enforce, any right or remedy under any Loan Document, including Agent's sale, lease, or other disposition of Collateral after default, or any action or proceeding relating to any Loan Document; (g) to any participant or assignee of Agent or Lenders or any prospective participant or assignee; provided, that such participant or assignee or prospective participant or assignee is subject to confidentiality restrictions no less protective than the provisions of this Section 11.12; (h) otherwise to the extent consisting of general portfolio information that does not identify Borrower; or (i) otherwise with the prior consent of Borrower; provided, that any disclosure made in violation of this Agreement shall not affect the obligations of Borrower or any of its Affiliates or any guarantor under this Agreement or the other Loan Documents. Agent's and Lenders' obligations under this Section 11.12 shall supersede all of their respective obligations under the Non-Disclosure Agreement.

m. Assignment of Rights. Borrower acknowledges and understands that Agent or Lenders may, subject to Section 11.7, sell and assign all or part of its interest hereunder and under the Loan Documents to any Person or entity (an "Assignee"). After such assignment the term "Agent" or "Lender" as used in the Loan Documents shall mean and include such Assignee, and such Assignee shall be vested with all rights, powers and remedies of Agent and Lenders hereunder with respect to the interest so assigned; but with respect to any such interest not so transferred, Agent and Lenders shall retain all rights, powers and remedies hereby given. No such assignment by Agent or Lenders shall relieve Borrower of any of its obligations hereunder. Lenders agree that in the event of any transfer by it of any promissory notes, it shall endorse thereon a notation as to the portion of the principal of such promissory notes, which shall have been paid at the time of such transfer and as to the date to which interest shall have been last paid thereon.

n. Revival of Secured Obligations; Termination. Other than as set forth in Section 11.6, his Agreement and the other Loan Documents shall terminate on the payment in full in cash of the Secured Obligations (other than any obligations that specifically survive termination). Notwithstanding the preceding sentence, this Agreement and the Loan Documents shall remain in full force and effect and continue to be effective if any petition is filed by or against Borrower for liquidation or reorganization, if Borrower becomes insolvent or makes an assignment for the benefit of creditors, if a receiver or trustee is appointed for all or any significant part of Borrower's assets, or if any payment or transfer of Collateral is recovered from Agent or Lenders. The Loan Documents and the Secured Obligations and Collateral security shall continue to be effective, or shall be revived or reinstated, as the case may be, if at any time payment and performance of the Secured Obligations or any transfer of Collateral to Agent, or any part thereof is rescinded, avoided or avoidable, reduced in amount, or must otherwise be restored or returned by, or is recovered from, Agent, Lenders or by any obligee of the Secured Obligations (other than obligations that survive termination), whether as a "voidable preference," "fraudulent conveyance," or otherwise, all as though such payment, performance, or transfer of Collateral had not been made. In the event that any payment, or any part thereof, is rescinded, reduced, avoided, avoidable, restored, returned, or recovered, the Loan Documents and the Secured Obligations shall be deemed, without any further action or documentation, to have been revived and reinstated except to the extent of the full and final payment to Agent or Lenders in cash.

o. Counterparts. This Agreement and any amendments, waivers, consents or supplements hereto may be executed in any number of counterparts, and by different parties hereto in separate counterparts, each of which when so delivered shall be deemed an original, but all of which counterparts shall constitute but one and the same instrument.

p. No Third Party Beneficiaries. No provisions of the Loan Documents are intended, nor will be interpreted, to provide or create any third-party beneficiary rights or any other rights of any kind in any Person other than Agent, Lenders and Borrower unless specifically provided otherwise herein, and, except as otherwise so provided, all provisions of the Loan Documents shall be personal and solely among Agent, Lenders and the Loan Parties which are a party thereto.

q. Agency. Agent and each Lender hereby agree to the terms and conditions set forth on Addendum 3 attached hereto. Borrower acknowledges and agrees to the terms and conditions set forth on Addendum 3 attached hereto.

r. Publicity. None of the parties hereto nor any of its respective member businesses and Affiliates shall, without the other parties' prior written consent (which shall not be unreasonably withheld or delayed), publicize or use (a) the other party's name (including a brief description of the relationship among the parties hereto), logo or hyperlink to such other parties' web site, separately or together, in written and oral presentations, advertising, promotional and marketing materials, client lists, public relations materials or on its web site (together, the "Publicity Materials"); (b) the names of officers of such other parties in the Publicity Materials; and (c) such other parties' name, trademarks, servicemarks in any news or press release concerning such party; provided however, notwithstanding anything to the contrary herein, no such consent shall be required (i) to the extent necessary to comply with the requests of any regulators, legal requirements or laws applicable to such party, pursuant to any listing agreement with any national securities exchange (so long as such party provides prior notice to the other party hereto to the extent reasonably practicable) and (ii) to comply with Section 11.12.

s. Multiple Borrowers. If another party is joined as a Borrower hereunder after the Closing Date, each Borrower hereby agrees to the terms and conditions set forth on Addendum 4 attached hereto.

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263757953 v7

[SIGNATURE PAGE TO LOAN AND SECURITY AGREEMENT]

IN WITNESS WHEREOF, Borrower, Agent and Lenders have duly executed and delivered this Loan and Security Agreement as of the date set forth above.

BORROWER:

SERES THERAPEUTICS, INC.

Signature: _____

Print Name: _____

Title: _____

~~212788652 v9~~

263757953 v7

Accepted in Palo Alto, California:

AGENT:

HERCULES CAPITAL, INC.

Signature: _____

Print Name: _____

Title: _____

LENDERS:

HERCULES CAPITAL, INC.

Signature: _____

Print Name: _____

Title: _____

~~212788652 v9~~

263757953 v7

Table of Addenda, Exhibits and Schedules

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is both (i) not material and (ii) the type that the Registrant treats as private or confidential.

EXECUTION VERSION

LONG TERM MANUFACTURING AGREEMENT

THIS LONG TERM MANUFACTURING AGREEMENT (the "**Agreement**"), effective as of November 8, 2021 (the "**Effective Date**"), is made and entered into by and between Seres Therapeutics, Inc. ("**Seres**"), a corporation organized and existing under the laws of Delaware, having its principal place of business at 200 Sidney Street, Cambridge, MA 02139, USA; and BacThera AG, a joint venture between Chr. Hansen A/S and Capsugel Belgium NV, a Lonza Group Affiliate, ("**Lonza**"), having a place of business at Hochbergerstrasse 60A, 4057 Basel, Switzerland ("**Bacthera**"). Seres and Bacthera may be referred to herein individually as a "**Party**" or collectively as the "**Parties**."

WHEREAS, Bacthera and its Affiliates are in the business of evaluation, development and manufacture of live biotherapeutic products; and

WHEREAS, Seres desires to have its products SER-109 and, if agreed by the Parties, SER-287 (each a "**Product**" and collectively, the "**Products**") Manufactured by one or more entities, including Bacthera, for commercial supply. All Manufacturing to be provided in relation to the Product or work to be performed under this Agreement may be performed by Bacthera, or, subject to Section 11 herein, (i) by an Affiliate of Bacthera or (ii) by a third party contractor acting on Bacthera's behalf.

WHEREAS, Bacthera and its Affiliates intend to finance and construct a Microbiome Center of Excellence (the "**CoE**") in Visp, Switzerland, and, subject to the terms and conditions herein, have agreed to establish a dedicated full-scale production suite for Seres within the CoE as further defined in Exhibit 1 and its Attachments, such production suite to be dedicated to the Manufacture of the Products (hereinafter, the "**Facility**"); and

WHEREAS, on May 17, 2021, the Parties entered into that certain Letter Agreement, which was amended on August 16, 2021 and October 22, 2021 ("**LOI**") pursuant to which Bacthera was to perform certain services in connection with the design and construction of the CoE and the Facility during the negotiation of this Agreement (the **"LOI Services"**) and Seres paid Bacthera a [***] (the "**Deposit**").

WHEREAS, Bacthera has agreed to Manufacture the Product(s) at the CoE in the Facility in accordance with this Agreement;

NOW, THEREFORE, in consideration of the mutual covenants and obligations set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

1. DEFINITIONS

As used in the Agreement, the following terms are defined as indicated:

1.1 **"Affiliate"** means with respect to either Party, any business entity controlling, controlled by, or under common control with such Party. For the purpose of this definition only, "control" means (a) the possession, directly or indirectly, of the power to direct the management or policies of a business entity, whether through the ownership of voting securities, by contract or otherwise, or (b) the ownership, directly or indirectly, of at least fifty percent (50%) of the voting securities or

other ownership interest of a business entity; provided that, if local law requires a minimum percentage of local ownership, control will be established by direct or indirect beneficial ownership of one hundred per cent (100%) of the maximum ownership percentage that may, under such local law, be owned by foreign interests.

1.2 "**Applicable Law**" shall mean all international, national, federal, state, provincial and local laws, statutes, codes, guidelines, rules, regulations, ordinances, orders, decrees or other pronouncements of any governmental, administrative or judicial authority or applicable engineering, construction, safety, or electrical code, whether or not contained in any applicable permit or approval, that apply to either of the Parties' respective obligations hereunder, including cGMP and/or the Design and Construction Work.

1.3 "**Approved Specifications**" mean the Initial Design Document, as may be adjusted by a Change Order issued pursuant to Exhibit 1.

1.4 "**Bacthera Intellectual Property**" means Bacthera Background Intellectual Property and New Bacthera Intellectual Property.

1.5 **"Batch"** means either a Scale A Batch or Scale B Batch.

1.6 "**Bacthera Personnel**" mean employees of Bacthera or one of its Affiliates or one of their respective contractors who are assigned to perform Bacthera's obligations under this Agreement.

1.7 "**Bacthera Competitor**" means an entity primarily engaged in the Manufacture of drug products and drug substances for third parties.

1.8 "**Business Day**" means Monday through Friday, excluding public holidays observed by Bacthera in Switzerland.

1.9 "**CapEx Target**" has the meaning set forth in Exhibit 1.

1.10 **"Certificate of Analysis"** means a document prepared by Bacthera listing tests performed by Bacthera or approved external laboratories on representative Batch sample(s), setting forth the Product Specifications, test methods used, actual results, date and signature of authorised personnel, and other technical information deemed necessary for its proper use, and, if external laboratories have performed any such tests, the name and address of such external laboratories.

1.11 **"Certificate of Compliance"** means a document signed by the responsible person or its delegates of Bacthera in connection with the Manufacture of a Batch of Product that evidences such Batch's compliance with cGMPs, the applicable Product Specifications, and Master Batch Record.

1.12 **"Change of Control"** means the occurrence of any one of the following: (a) any person (as the term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934, as amended (the Exchange Act)) is or becomes the beneficial owner (as defined in Rule 13d-3 under the Exchange Act), directly or indirectly, of voting securities of Seres representing more than 50% of Seres' outstanding voting securities or rights to acquire such securities; (b) any sale, lease, exchange or other transfer (in one transaction or a series of transactions) of all or substantially all of the assets

of Seres; or (c) a plan of liquidation of Seres or an agreement for the sale or liquidation of Seres is approved and completed.

1.13 "**Charges**" mean the amounts to be paid by Seres pursuant to Exhibit 4.

1.14 "**Commencement Date**" means [***], or other date as may be agreed by the Parties pursuant to a Change Order under Exhibit 1.

1.15 **"Commercially Reasonable Efforts"** mean taking such steps and performing in such a manner as a well-managed company would undertake where such company was acting in a determined, prudent, and reasonable manner to achieve the particular result provided that such steps are within the reasonable control of the Party required to exert such efforts.

1.16 **"Confidential Disclosure Agreement"** means that certain Mutual Confidential Disclosure Agreement, dated as of September 3, 2020 and as amended on September 9, 2021, by and between the Parties.

1.17 **"Consumables"** mean the consumable products and packaging supplies and components, required by Bacthera to Manufacture a Product as set forth in the applicable Master Batch Record.

1.18 **"Controlled"** means, with respect to an item or an intellectual property right, possession of the ability, whether arising by ownership or license, to grant a license or sublicense as provided for in this Agreement under such item or right without violating the terms of any written agreement with any third party.

1.19 "**CQV Completion**" has the meaning given in Exhibit 1.

1.20 **"Current Good Manufacturing Practices"** or **"cGMP"** means those laws and regulations applicable in the U.S., European Union and Switzerland, relating to the manufacture of medicinal products for human use, including, without limitation, current good manufacturing practices as specified in the ICH guidelines, including without limitation, ICH Q7 "ICH Good Manufacturing Practice Guide for Active Pharmaceutical Ingredients", US Federal Food Drug and Cosmetic Act at 21CFR (Chapters 210, 211, 600, 610 and 820) and Commission Directive 2003/94/EC of 8 October 2003, laying down the principles and guidelines of good manufacturing practice in respect of medicinal products for human use and investigational medicinal products for human use, Commission Delegated Regulation (EU) No 1252/2014 of 28 May 2014 supplementing Directive 2001/83/EC of the European Parliament and of the Council with regard to principles and guidelines of good manufacturing practice for active substances for medicinal products for human use, the EU Guidelines to Good Manufacturing Practice for Medicinal Products and the Swiss Federal Act on Medicinal Products and Medical Devices 812.21. For the avoidance of doubt, Bacthera's operational quality standards are defined in internal cGMP policy documents.

1.21 "**Design and Construction Work**" means all tangible and intangible goods and services to be provided, and all acts or actions required under this Agreement (including under Exhibit 1) or reasonably necessary, for the design, engineering, supply and procurement, manufacturing, packing and transportation, construction, commissioning, start-up, testing, guaranteeing the

performance of the Facility, and other acts required under this Agreement or reasonably necessary to deliver with a fully-operational Facility, until Final Acceptance of the Facility.

1.22 "**Facility Materials**" means the equipment, machinery and materials required for the Design and Construction Work according to Exhibit 1. The term "Facility Materials" shall include equipment, machinery, tools, consumables, supplies and systems, purchased, owned, rented, or leased by Bacthera, its Affiliates or third parties for use in accomplishing the Design and Construction Work, but not intended for incorporation into the Facility.

1.23 **"FDA"** means the United States Food and Drug Administration or any successor entity thereto.

1.24 **"FD&C Act"** means the United States Federal Food, Drug and Cosmetic Act, as may be amended from time to time.

1.25 "**Forecast**" means the requests for an estimated number of binding and non-binding Scale A and Scale B Batches for the next [***] months for each Product by Seres.

1.26 **"Governmental Authority"** means any supranational, national, regional, state or local government, court, governmental agency, authority, board, bureau, instrumentality, or regulatory body.

1.27 "**Initial Design Document"** means Attachment A to Exhibit 1.

1.28 **"Intellectual Property"** means ideas, concepts, discoveries, inventions, patents, copyrights, trademarks, trade names and domain names, rights in designs, rights in computer software, database rights developments, rights in confidential information (including know-how), trade secrets, techniques, methodologies, modifications, innovations, improvements, writings, documentation, data and rights (whether or not protectable under state, federal or foreign patent, trademark, copyright or similar laws) or the like, whether or not written or otherwise fixed in any form or medium, regardless of the media on which contained and whether or not patentable or copyrightable and whether registered or unregistered. The foregoing includes all applications (or rights to apply) for, and renewals or extensions of, any of the rights described in the foregoing clause (where applicable) and all rights and applications that are similar or equivalent to the rights and application described in the foregoing clauses, which exist now, or which come to exist in the future, in any part of the world.

1.29 "**Interest Rate**" means [***]% per year.

1.30 **"Licensed Know-How**" means any and all technology, information, expertise, know-how, and/or trade secrets Controlled by Bacthera that is necessary or useful for the Manufacture of the Products and/or the Manufacture, use, sale, offer for sale, and importation of the Products.

1.31 "**Manufacture**," "**Manufacturing**," and "**Manufactured**" mean all activities involved in the manufacture and production of a Product, including, without limitation, Materials sourcing, storage, handling and testing; packaging (primary and secondary); preparation; formulation; processing; production; filling; component assembly; finishing; analysis; labelling; warehousing; quality control testing (including in-process, release and stability testing, when applicable);

Release; storage; making Product available for delivery; and the handling, storage and disposal of any residues or wastes generated thereby.

1.32 "**Marketing Approval**" means all approvals, licenses, registrations, authorizations or clearances of any Regulatory Authority necessary for the commercialization, distribution, marketing, offer for sale, use, importation into, storage, and sale in the territory of the Product at either Scale Manufactured by Bacthera at the Facility.

1.33 **"Master Batch Record"** or **"MBR"** means, with respect to each Product to be Manufactured hereunder, a formal set of instructions given by Seres for the Manufacture of each such Product and shall include, without limitation, the applicable Material Specifications, other procedures, directions and controls associated with the Manufacture and testing of the Product and Product Specifications. The MBR shall be developed and maintained in Bacthera's standard format by Bacthera, as per Seres' instructions and agreement, and using master formulation and technical support.

1.34 "**Material Loss**" means the cost of the SRM, Exhibit 7 Materials, or Products (including Products in any state of Manufacture) lost during the performance of Bacthera's obligations hereunder to the extent caused by (a) [***] of or any Bacthera Personnel or (b) breach by Bacthera of any material term of this Agreement or the Quality Agreement.

1.35 **"Materials"** as used in this Agreement collectively means all materials required for Manufacture of Product, including the SRM, Consumables, and Raw Materials, including any in-process materials, processing aids, substances, intermediates, components, and ingredients (active and inactive) and primary packaging supplies

1.36 "**Material Specifications**" means the specifications for Materials, including, but not limited to, written release specifications and testing instructions, as specified in the Master Batch Record or as otherwise mutually agreed upon in writing by the Parties.

1.37 "**Operating Documents**" mean the corporate standards, standard operating procedures, standard manufacturing procedures, Bacthera customized manufacturing procedures developed prior to the Effective Date or outside the scope of this Agreement, electronic programs and files, protocols, validation documentation, and supporting documentation used by Bacthera, that a third party manufacturer or any facility operated by Seres would reasonably be expected to have, excluding any of the foregoing that (i) are unique to the Manufacture of the Product(s); (ii) are otherwise reasonably required for a reasonably skilled manufacturer to seamlessly assume responsibility for Manufacture of the Products or (iii) relate to environmental monitoring of the Facility.

1.38 "**Person**" means any individual, corporation, partnership, limited liability company, firm, joint venture, association, joint-stock company, trust, unincorporated organization, Regulatory Authority or other entity.

1.39 "**Product Specifications**" means the specifications for a Product, including the [***]. The Product Specifications for SER-109 as of the Effective Date are set forth in Exhibit 2. If Seres elects to add

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SER-287 as a Product to this Agreement, Exhibit 2 shall be updated to include the specifications for SER-287.

1.40 "**Prudent Industry Practice**" means the codes and standards specified in this Agreement (including Exhibit 1) and the Approved Specifications, except to the extent such codes and standards do not address or are not otherwise applicable to the circumstances at issue, then Prudent Industry Practice shall mean those sound and prudent practices, methods, specifications or standards of design, engineering, construction, performance, safety, workmanship, equipment and components prudently and generally engaged in or observed by the majority of the professional engineering, equipment supply and construction contractors in the pharmaceutical industries for similar types of facilities as of the Effective Date, in the exercise of reasonable judgment, skill, diligence and care that would have been expected from experienced and qualified contractors, engineers, equipment manufacturers, or operators to accomplish the desired result in a manner consistent with Applicable Law, reliability, safety, environmental protection and local conditions.

1.41 **"Purchase Order"** means written orders from Seres to Bacthera which shall specify (a) the number of Batches of Product ordered, (b) the Product ordered, (c) shipping instructions (e.g. choice of container, temperature requirements), (d) requested Delivery Dates, and (e) delivery destinations.

1.42 **"Quality Agreement"** means the quality agreement, setting out the responsibilities of the Parties in relation to quality as required for compliance with cGMP.

1.43 **"Raw Materials"** means all excipients, inactive ingredients and other substances used by Bacthera in the Manufacture of a Product, with the exception of SRM and Consumables, as specified in the applicable Master Batch Record.

1.44 **"Regulatory Authority"** means FDA, EMA, Swissmedic or other governmental or regulatory body, agency authority or entity which regulates, directs or controls the Manufacture, testing, commercialization or use of the Product in the country where the Product is Manufactured or sold.

1.45 "**Regulatory Filings**" means the governmental filings required to obtain authorizations for or approval to conduct clinical trials or to market and sell a Product in a given country where the Product is Manufactured or sold, including, but not limited to, Product registrations and Marketing Approvals, as applicable, in each such country, and any other notice, submission or filing to a Regulatory Authority.

1.46 "**Release**" means, with respect to a Batch, the date on which Bacthera has provided to Seres the Certificate of Analysis and Certificate of Compliance.

1.47 **"Scale A Batch"** means a specific quantity of Product that (a) is intended to have uniform character and quality within specified limits, and (b) is Manufactured according to a single manufacturing order during the same cycle of manufacture as further specified in the Quality Agreement and applicable Master Batch Record, and (c) requires [***] and including [***]. The [***] limit of required SRM for a Scale A Batch shall be confirmed through process validation.

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1.48 **"Scale B Batch"** means a specific quantity of Product that (a) is intended to have uniform character and quality within specified limits, and (b) is Manufactured according to a single manufacturing order during the same cycle of manufacture as further specified in the Quality Agreement and applicable Master Batch Record, and (c) requires [***] than [***]. The [***] limit of required SRM for a Scale B Batch shall be confirmed through process validation.

1.49 **"Seres Supplied Materials"** means the SRM.

1.50 **"SOP"** means Bacthera's standard operating procedures applicable to the Manufacture of the Product.

1.51 **"SRM"** means the active pharmaceutical or biological ingredient as further set forth in Exhibit 3 provided by Seres.

1.52 **"Swissmedic"** means the national authorisation and supervisory authority for drugs and medical products.

1.53 "**Termination Assistance Period**" means the period specified by Seres, which shall not exceed [***] days total (of which [***] days may extend the Term) unless otherwise approved by the JSC.

1.54 "**Theoretical Capacity**" means the design capacity of the Facility for the Manufacture of Product.

2. FACILITY DESIGN AND CONSTRUCTION

The Parties' rights and obligations with respect to the Design and Construction Work are set forth in Exhibit 1. The Facility shall meet the requirements of the Approved Specifications and Sections 2 and 4 of Exhibit 1.

3. PROGRAM GOVERNANCE

3.1 The Parties shall form a joint development team (the "**JSC**"), made up of an equal number of representatives of Seres and Bacthera (not to exceed three (3) each), each of whom shall have sufficient decision-making authority, which shall have responsibility for planning, coordinating and directing all activities under, and pursuant to, this Agreement. In particular, the JSC shall provide program oversight and facilitate and review the Design and Construction Work (including amendments to the Approved Specifications or any changes to CapEx Target for the Facility), Manufacturing operations hereunder and key personnel changes. For the avoidance of doubt, Bacthera shall not depend on the decisions of the JSC and Seres for the construction of the CoE. In addition to the JSC members, each Party shall designate a project manager who will sit on the JSC and who shall be responsible for ensuring clear and responsive communication between the Parties and the effective exchange of information, serving as the primary point of contact for any issues arising under this Agreement, implementing and coordinating activities, and facilitating the exchange of information between the Parties, with respect to the Facility and Manufacturing operations hereunder.

3.2 Each of the Parties shall cause their representatives who are members of the JSC to fulfil all of the obligations of the JSC under this Agreement, and to act in accordance with the requirements of

this Agreement. The representatives for either Party on the JSC may be changed at any time upon written notice to the other Party.

3.3 Until completion of the Design and Construction Work in accordance with Exhibit 1, the JSC shall meet no less than once per calendar month (and more often as is reasonably considered necessary at the request of any Party with reasonable notice) to provide an update on progress of the Design and Construction Work, carry out the JSC's responsibilities under this Agreement and to make decisions regarding progress against the timelines set out in Exhibit 1 and the allocation of resources for the Design and Construction Work and any modifications to the CapEx targets.

3.4 From the Commencement Date until the second anniversary thereof, the JSC shall meet no less than once per quarter (and more often as is reasonably considered necessary at the request of any Party with reasonable notice). Thereafter, the JSC shall meet twice per year (and more often as is reasonably considered necessary at the request of any Party with reasonable notice).

3.5 Either Party may call a meeting of the JSC upon no less than [***] days' notice to all other members of the JSC unless otherwise agreed by the JSC.

3.6 Meetings of the JSC may be held as a face-to-face meeting, teleconference or video conference, provided that all representatives participating in such meeting can communicate with each other simultaneously and instantaneously. The JSC shall hold one face-to-face meeting as agreed by JSC members per year (or other frequency agreed by the JSC). The presence of at least one member of the JSC from each Party shall be required for a quorum, and each Party may have a reasonable number of non-voting participants at such meetings, who shall be subject to confidentiality provisions at least as restrictive as those referred to in Section 14 of this Agreement.

3.7 The JSC will [***], with each Party's members [***]. When [***] on any matter, [***].

3.8 All decisions made by the JSC shall be reflected in the minutes taken at each meeting of the JSC. The responsibility for preparing and delivering such minutes shall alternate between the Parties. Such minutes shall be communicated to each of the members of the JSC by means of facsimile or electronic mail. Any objection by a member of the JSC to the contents of the minutes of any meeting of the JSC must be by communication to the other members of the JSC within [***] business days following the communication of those minutes to the members.

4. BACTHERA PERSONNEL

4.1 Bacthera shall use Commercially Reasonable Efforts to ensure that the individuals identified as "Key Personnel" in Exhibit 5 and FTEs specified are available to Manufacture each Batch of Product ordered by Seres hereunder.

(a) Before assigning an individual to be one of the Key Personnel, Bacthera will notify Seres of the proposed assignment, introduce the individual to appropriate Seres representatives and provide Seres with a résumé and other information about the individual reasonably requested by Seres. If Seres in good faith objects to the proposed assignment, Bacthera will propose alternatives within a time period as to not leave a role vacant for more than [***] days or than otherwise reasonably agreed by both Parties.

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(b) Other than in the case of a resignation without notice, departures due to incapacity or death, or termination for cause under circumstances in which termination without notice is appropriate, Bacthera may not remove an individual assigned to be one of the Key Personnel until Seres has approved a suitable replacement (which approval shall not be unreasonably withheld, conditioned or delayed) and such replacement has been properly trained and made familiar with the Manufacture of the Products.

(c) The Project Manager (as defined in Exhibit 1) assigned to work for Seres under this Agreement and the Direct FTEs in the Facility may [***] that [***] during [***]. [***].

4.2 Bacthera shall employ or engage a sufficient number of qualified and adequately trained Bacthera Personnel to ensure that Bacthera is able to meet its obligations under this Agreement, including Manufacture and delivery of Products in accordance with this Agreement (including delivery of the Products on or before the Delivery Date specified in the applicable Purchase Order).

4.3 Bacthera shall use Commercially Reasonable Efforts to guarantee that any absences due to illness and vacation of the trained Bacthera Personnel will not affect the compliance of its obligations, up to and including retaining appropriately experienced and trained staff for overtime work at its own expense.

4.4 The initial staffing plan for the Facility is set forth on Exhibit 6. The personnel filling the roles set forth therein (the "**Direct FTEs**") [***]. Bacthera will cause each of the Direct FTEs to devote substantially full time and effort to the Manufacture of Products unless otherwise approved by Seres.

4.5 The Bacthera Personnel assigned to perform Bacthera's obligations will be qualified and adequately trained. Bacthera will promptly remove an individual from Manufacturing under this Agreement upon Seres' reasonable request if removal is in the interest of Manufacture. The Parties will immediately convene a meeting of the JSC to discuss the matter and vote on whether removal was reasonable and its impact on the production schedule. If either Party disputes the vote, resolution will follow the escalation pathway in Section 17.

4.6 As between Bacthera and Seres, Bacthera Personnel will be and remain employees, contractors, consultants or agents of Bacthera and/or its Affiliates, and Bacthera and/or its Affiliates will be solely responsible for the payment of compensation for the employees of Bacthera and/or its Affiliates (including applicable workers' compensation insurance, social security contributions, and other similar statutory and fringe benefits). Bacthera covenants and agrees that Bacthera and/or its Affiliates will maintain workers' compensation benefits and employers' liability insurance as required by Applicable Laws with respect to all employees of Bacthera and/or its Affiliates working at the CoE.

5. FACILITY

5.1 Person in Plant. Seres shall be permitted to have, at no additional cost, [***] based at the Facility (the "**Observer**") for the purpose of observing, reporting on, and consulting as to the performance of the Manufacture of the Product. Upon Seres' reasonable request, Bacthera will allow Seres up to [***] additional Personnel to visit the Facility, any other relevant areas for Manufacturing of

the Products and any other common areas inside the CoE (e.g. entrance) and in particular the Facility, [***] from time to time for purposes of consulting on Manufacture of the Product, knowledge transfer and quality issues (the Observer and the [***] additional ones are referred to as "**Personnel**"). Subject to the terms of this Agreement, such Personnel shall not disrupt Manufacturing. For the avoidance of doubt, Bacthera shall not be obliged to make office space available for such Personnel other than the Observer. Such Personnel, while at the Facility, shall be subject to and agree to abide by (i) confidentiality obligations towards third parties, including by signing appropriate confidentiality agreements, and (ii) Bacthera's customary practices and operating procedures and security procedures and general site policies of accessing the Visp manufacturing site and entering the Facility provided to the Personnel. Such Personnel will comply with all reasonable instructions of Bacthera's employees at the Facility. Seres will be liable for any breaches of security by the Personnel. In addition, Seres will reimburse Bacthera for the cost of any lost security cards issued to the Personnel, at the rate of $ 50 per security card.

5.2 As between Bacthera and Seres, Personnel working at the Facility will be and remain employees, contractors, consultants or agents of Seres, and Seres will be solely responsible for the payment of compensation for such Personnel (including applicable Federal, state and local withholding, FICA and other payroll taxes, workers' compensation insurance, health insurance, and other similar statutory and fringe benefits). Seres covenants and agrees to maintain workers' compensation benefits and employers' liability insurance as required by Applicable Laws with respect to all Personnel working at the Facility.

5.3 Seres will pay for the actual cost of repairing or replacing to its previous status (to the extent that Bacthera determines, in its reasonable judgments, that repairs cannot be adequately effected) any property of Bacthera damaged or destroyed by Personnel, provided Seres shall not be liable for repair or replacement costs resulting from ordinary wear and tear.

5.4 The Facility will be in operation[***] weeks per year, with no more than [***] weeks of shutdown each year following PPQ completion or as otherwise agreed by the Parties. Bacthera will be responsible for maintenance (including preventative maintenance) of the Facility (and equipment therein). Seres will reimburse Bacthera for additional capital expenses it incurs to replace equipment dedicated to Seres in the Facility at the end of its useful life.

5.5 Prior to [***] without Seres prior consent.

6. SERES OBLIGATIONS

6.1 Excuse:

(a) Bacthera shall not be responsible for any delays directly arising out of Seres' failure to perform its obligations under this Agreement, and Bacthera shall be excused from any failure to perform its obligations under this Agreement (including a failure to perform an obligation within the timeframes required under this Agreement), if and to the extent:

(i) Seres' failure to perform its obligations under this Agreement or any of its Exhibits prevented Bacthera from performing its obligations;

(ii) such failure by Bacthera would not have occurred but for Seres' failure to perform its obligations; and

(iii) Bacthera provides Seres with prompt notice following discovery of such nonperformance by Seres and uses Commercially Reasonable Efforts to perform notwithstanding Seres' failure to perform. Seres acknowledges and agrees that such notice from Bacthera of a delay in delivery of SRM will be deemed to satisfy Bacthera's notice provision hereunder in the event of such a delay.

(b) To the extent any delay in performance by Bacthera is excused under this Section 6.1, (i) the deadlines for Bacthera performance shall be extended for a reasonable period of time to accommodate the delay actually and reasonably caused by Seres' failure to perform its obligations in accordance with this Agreement; and (ii) Seres shall be responsible for any actual and reasonable out of pocket costs and expenses incurred by Bacthera as a result of such delay.

(c) To the extent any delay in performance by Bacthera is excused under this Section 6.1 and such delay causes [***], Bacthera shall be entitled to commence invoicing the Suite Fee as of the date the [***].

(d) If an extension under Section 6.1(b) results in a cancellation of a Batch that is not included in the Suite Fee, then Seres will pay a cancellation fee calculated in accordance with Exhibit 4.

6.2 Seres Obligations.

(a) Without limiting the generality of Seres' other obligations under this Agreement, Seres' obligations during each of the following three phases are:

CONSTRUCTION (UP TO CQV COMPLETION)	PERFORMING SERES OBLIGATIONS UNDER EXHIBIT 1 IN ACCORDANCE WITH THE TIMELINES SET FORTH THEREIN.
Technology Transfer	Performing Seres' obligations under Exhibit 8 (Technology Transfer) in accordance with the timelines set forth therein.
Following Marketing Approval at either Scale A or B	•Providing Forecasts in accordance with this Agreement • Providing SRM [***] • Performing Seres' obligations under the Quality Agreement in accordance with the timelines set forth therein • [***] • [***] • Market release

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is both (i) not material and (ii) the type that the Registrant treats as private or confidential.

(b) Seres will make decisions in a timely manner and provide Bacthera such information regarding the Manufacturing process as may be reasonably requested by Bacthera and otherwise perform the functions expressly stated as a Seres responsibility in this Agreement and its Exhibits in accordance with the timelines, if any, set forth therein.

7. **PURCHASE AND SUPPLY**

7.1 [***] months prior to the Commencement Date, Seres shall provide to Bacthera a non-binding rolling Forecast of its requests for each Product and update it monthly.

7.2 Promptly upon Seres' receipt of Marketing Approval for a Product, Seres shall provide to Bacthera a non-binding [***] month Forecast of the number of Batches of each Product to be Manufactured in each month to be updated monthly. The first [***] months of a Forecast shall be binding.

7.3 Following receipt of each Forecast, and without limiting its obligations to supply the Product in accordance with this Agreement, Bacthera shall promptly provide Seres with a production schedule for the number of Batches included in such Forecast.

7.4 Seres may change the monthly quantity of Batches in the [***] month of a Forecast by up to the greater of [***]% or [***] per month or, upon Bacthera approval, more than [***]%. Seres may change the monthly quantity of Batches in the [***] month of the latest [***] month Forecast without limitation; provided that Seres shall not increase the Forecast for a month to Batches in excess of the [***].

7.5 Seres shall submit in writing or electronically Purchase Orders for the Batch(es) to Bacthera. Bacthera shall deliver the requested Batch(es) per the date specified by Seres in the Purchase Order consistent with the [***] of [***] and [***] of [***] ("**Delivery Date**"). If Seres submits a Purchase Order to Bacthera without providing at least the Minimum Lead Time, Bacthera will not be required to deliver the ordered Batch by the requested Delivery Date, but will use Commercially Reasonable Efforts to deliver the Batch in the Purchase Order on the requested date. The "**Minimum Lead Time**" for a Batch of SER-109 is [***] days, and for SER-287 shall be defined by the JSC. For clarity the Minimum Lead Time starts with receipt of the Purchase Order by Bacthera and ends at the Release.

7.6 Unless Bacthera expressly notifies Seres otherwise, Bacthera shall be deemed to have accepted any and all such Purchase Orders from Seres consistent with the [***] of the Forecast of [***]. In the event that Seres places Purchase Orders for Batches in excess of such binding period of the Forecast, then Bacthera shall, subject to available capacity and as reasonable as possible, deliver the excess Batches on the Delivery Date.

7.7 Seres may cancel a Batch, including production of a Batch to be Manufactured under a Purchase Order, upon written notice to Bacthera. Seres shall pay the cancellation fee (the "**Cancellation Fee**") as set forth in Exhibit 4.

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is both (i) not material and (ii) the type that the Registrant treats as private or confidential.

8. MATERIALS

8.1 Seres or its designees shall obtain and supply to Bacthera the SRM [***]. Seres shall further provide to Bacthera such data and information as necessary to apprise Bacthera of the proper storage and safe handling requirements for the SRM delivered by Seres or its designees, compliant to the Material Specifications. Bacthera will notify Seres as to Bacthera's requirements for the SRM with reasonable lead-time prior to commencement of Manufacturing a Batch. Bacthera will promptly notify Seres of any SRM damaged or lost while in the possession of or under the control of Bacthera. Bacthera will promptly reimburse Seres for the costs of the SRM, such cost not to exceed [***].

8.2 Exhibit 7 sets forth the Parties' understanding as of the Effective Date of the Raw Materials and Consumables that are to be used in the testing; packaging (primary and secondary); preparation; formulation; processing; production; filling; component assembly; finishing; analysis; labelling; quality control testing (including in-process, release, when applicable); and Release of the Products (the "**Exhibit 7 Materials**"). At least [***], the Parties will update Exhibit 7 to reflect any [***] that should be included thereon.

8.3 Bacthera will [***]

8.4 Bacthera shall [***].

8.5 Bacthera shall be responsible for and supply in accordance with the relevant Material Specifications, [***] in adequate quantities to be used by Bacthera for the Manufacture of the Product. The Parties agree that Bacthera is [***].

8.6 Bacthera shall procure [***], in each case that are compliant to the applicable Material Specifications.

8.7 Bacthera will instruct the suppliers [***]. Promptly, but in any event, within [***].

8.8 Upon full payment, [***]. Bacthera shall procure [***].

8.9 Bacthera shall handle the Materials in accordance with the applicable requirements of this Agreement and the Quality Agreement. For Exhibit 7 Materials that do not meet applicable requirements of this Agreement and the Quality Agreement, [***]. Bacthera shall use Materials on a first-in first-out basis.

8.10 Bacthera shall maintain an accurate inventory of Materials on hand throughout the Term and provide Seres a monthly report (each, an "**Inventory Report**") of the quantity of each Material in its inventory (which report shall include identification, quantity and value). On each anniversary of the Commencement Date, Bacthera shall conduct, with a Seres representative, a physical inventory of all Materials and equipment and a quarterly risk-based physical inventory thereof and promptly provide Seres with a report indicating any variations from the latest Inventory Report.

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8.11 Without limiting each Party's obligation to comply with the terms of this Agreement, each Party shall use Commercially Reasonable Efforts to minimize the other Party's Raw Material and Consumable costs.

8.12 Upon cancellation of any Batch or termination or expiration of the Agreement, all unused Materials shall, at Seres' election, be (a) held by Bacthera for future use for the Manufacture of Product for up to [***] months under the provisions of Section 9.10, (b) delivered to Seres, or (c) disposed of by Bacthera. Destruction and delivery costs will be borne by Seres, unless Seres terminates this Agreement under Section 18.2(a)(i), in which case Bacthera shall bear such costs.

9. MANUFACTURE AND DELIVERY

9.1 **Generally**. Bacthera is responsible for providing resources (facilities, personnel, infrastructure) necessary to Manufacture the Product in accordance with the Forecast.

9.2 **Testing**. [***] prior to delivery of such Batch by Bacthera to Seres or its designee. [***] shall conduct the [***]. Notwithstanding the foregoing, [***].

9.3 **Facility**. Bacthera shall Manufacture each Product at the Facility. Bacthera shall maintain, the Facility and any other area relevant for the Manufacture of the Product(s) in a state of repair and operating efficiency consistent with the requirements of cGMP and other Applicable Law. In the event any change in the requirements of cGMP and other Applicable Law results in any regulatory or other costs to Bacthera, or requires that Bacthera make any expenditures at the Facility, such costs and expenditures shall be made and reimbursed in accordance with the procedures set forth in Exhibit 4.

9.4 **Changes to Product Specifications**. In the event any change in the applicable Product Specifications for a Product (as they may have changed from time to time under this Agreement) requested by Seres or mandated by Applicable Law results in any regulatory or other costs to Bacthera, or requires that Bacthera make any expenditures at the Facility, such costs and expenditures shall be made and reimbursed in accordance with the procedures set forth in Exhibit 4. Any change to the Product Specifications will be subject to Bacthera approval, which approval shall not be unreasonably withheld, conditioned or delayed.

9.5 **[***]**.

(a) Bacthera will use Commercially Reasonable Efforts to [***].

(b) Promptly after the completion of each of the first [***] Batches [***] of each Product, Bacthera will report to Seres the [***].

(c) Following (b) the Parties shall discuss and agree on an [***] based on the [***] in respect of such Batches, to be determined by the JSC from review of [***].

9.6 **Acceptance and Rejection**.

(a) Bacthera shall deliver to Seres, concurrently with the delivery of each Batch of Product that has met the Product Specifications, a Certificate of Compliance and such other

documents and materials required to be delivered under the applicable Quality Agreement. Seres shall promptly examine such Batch to determine whether the Product conforms to the applicable Product Specifications. Seres shall notify Bacthera in writing of any investigation or rejection of a Product based on any claim that it fails to meet the Product Specifications or shortage in quantity of any individual shipment of any Product within [***] Business Days after Bacthera's Release (or, in the case of any defects not reasonably susceptible to discovery upon receipt of the Product, within [***] after discovery by Seres); provided that Bacthera will not have any liability under this paragraph for rejected Product more than [***] after Release. If Seres fails to notify Bacthera of the non-conformity within the applicable period, then the delivery will be considered to have been accepted by Seres. Bacthera will have no liability for any non-conformance for which it has not received notice within the applicable period. Seres shall return any defective Batches to Bacthera or place such Batches in quarantine. Any such notice shall describe in reasonable detail the defect or non-conformity, and Seres shall initiate an investigation in consultation with Bacthera to determine whether the Batch should be accepted or rejected.

(b) If the Parties disagree on the outcome of the investigation, either Party may treat the matter as a dispute under Section 17.

9.7 **Costs Associated with Non-Conforming Batches (including In-Process Batches)**.

(a) Until the [***] has been defined, [***].

(b) Subject to Section 9.7(c), if a Batch fails to conform to the applicable Product Specifications, and such failure was attributable to Bacthera's breach of this Agreement or the Quality Agreement, or [***], Bacthera shall replace the non-conforming Batch as promptly as practicable. Unless the SRM contained latent defects that were not reasonably detectable by Bacthera upon receipt thereof, (i) Bacthera shall not charge for the replacement Batch and (ii) [***].

(c) Upon Bacthera's instructions, Seres shall destroy or return any non-conforming Batch, the costs of which will be borne by Bacthera if the non-conformance was attributable to Bacthera's failure to comply with this Agreement or the Quality Agreement.

(d) The costs of handling, storage, transportation, treatment and disposal of Products, or reproduction thereof, pursuant to Section 9.1 shall be allocated between the Parties in accordance with Sections 9.7(a) and 9.7(b).

9.8 **Delivery**. Bacthera shall deliver all released Products [***] at the Facility. On or before the Delivery Date specified in the applicable Purchase Order, Bacthera shall, as directed by Seres, deliver the Product to a carrier designated by Seres or into storage at the Facility. Bacthera will package and label the Product for shipment in accordance with the Master Batch Record and Bacthera's standard practices in effect at the time of performance by Bacthera. All Purchase Orders shall be filled in compliance with the terms and conditions of this Agreement and the Master Batch Record. Bacthera shall be responsible for preparation and submission of export declaration documents to Seres required for the Swiss export procedure of the Products. Any

third-party costs (e.g. duties, taxes, shipment) related to exporting will be reimbursed by Seres. Seres shall be responsible for the performance of the export clearance, import processes and clearances of the Products into the destination countries.

9.9 **Title**.

(a) [***].

(b) [***].

9.10 **Storage**. Bacthera will store the Materials, intermediates, and Products. In the event that storage outside the CoE is required, both Parties shall evaluate if storage outside of the Facility is possible. Bacthera may charge for such storage to the extent permitted under Exhibit 4. Bacthera shall store all Materials and Products in accordance with Applicable Law and Seres' reasonable instructions. With respect to Products intended for commercial distribution, Bacthera shall maintain at least the amount of safety stock of Materials (the "**Safety Stock**") necessary to supply the volume of Product included in the latest Forecasts for the next [***] days, to be further defined prior to CQV Completion. Such Safety Stock shall be stored in accordance with Seres' reasonable instructions and cGMPs, and shall be maintained for the period required by cGMPs, unless otherwise approved by Seres. Bacthera shall use Materials from Safety Stock on a first-in first-out basis.

9.11 **Batch Failure**. After completion of the ***subject to Section 7.4, if during a calendar year Bacthera fails to deliver more than [***] if the cause of the defect was that (i) the SRM contained latent defects that were not reasonably detectable by Bacthera upon receipt thereof or (ii) the root cause of the failure is deemed to be the analytical method itself, which was executed by Seres. [***].

9.12 **Improvements.** Bacthera shall use Commercially Reasonable Efforts to improve productivity and Batch yield, including the achievement of efficiency gains resulting from continuous improvement activities and improvements to Manufacturing processes, and other opportunities to reduce the costs and Charges that are to be paid by Seres. Upon identification of an opportunity for improved productivity or other cost reduction, Bacthera shall prepare a proposal for submission to the JSC. Such proposal shall identify any investment that will be required from each Party and how the Charges and costs will be reduced to reflect a reasonable return to each Party of its investment as described in Exhibit 4, [***]. Bacthera shall report on its efforts under this Section 9.12 at each JSC meeting.

9.13 **[***]. [***].

10. **INTELLECTUAL PROPERTY**

10.1 **Intellectual Property**.

(a) Except as the Parties may otherwise expressly agree in writing, each Party shall continue to own its existing patents, trademarks, copyrights, trade secrets and other Intellectual

Property ("**Background Intellectual Property**"), without conferring any interests therein on the other Party.

(b) Without limiting the generality of Section 10.1(a), but subject to Section 10.1(c), as between Bacthera and Seres, Seres shall own all right, title and interest arising under Applicable Law in and to the following developed by Bacthera or Seres under this Agreement: (i) all Products and the SRM, (ii) the processes, technology, know-how and techniques related to the Manufacture thereof that are not usable other than in the Manufacture of the Products, (iii) the labels for the Products (including any trademarks and copyrights associated therewith), and (iv) except as provided in Section 10.1(c), any inventions, discoveries, innovations, developments and improvements to any of the foregoing, in each case, whether patentable or copyrightable or not (collectively, **"New Seres Intellectual Property"**). [***].

(c) Without limiting the generality of Section 10.1(a), as between Bacthera and Seres, Bacthera shall own all right, title and interest arising under Applicable Law in and to (i) all and any Intellectual Property developed by Bacthera in the course of its performance of its obligations under this Agreement to the extent that its use can reasonably be considered to be generally and primarily applicable to manufacturing chemical or biological products or product components or intermediates thereof for multiple products (including the Products) that do not involve New Seres Intellectual Property, and (ii) any inventions, discoveries, innovations, developments and improvements based on Bacthera's Background Intellectual Property (collectively, **"New Bacthera Intellectual Property"**). Neither Seres nor any third party shall acquire any right, title or interest in New Bacthera Intellectual Property by virtue of this Agreement or otherwise, except to the extent expressly provided herein. [***].

(d) Neither Party shall disclose the other Party's Confidential Information that is included in the other Party's Intellectual Property in any patent application without the other Party's prior consent, which may not be unreasonably withheld, conditioned or delayed.

10.2 **License**.

(a) Subject to the terms of this Agreement, Seres will grant Bacthera on the Commencement Date a non-exclusive, royalty-free, revocable license to make the Products in the Facility during the Term and solely at the Facility. Such license shall not be sublicensable, assignable or transferable in whole or in part. In the event that Bacthera becomes aware of any possible or actual infringement by a third party of New Seres Intellectual Property, it shall provide immediate written notice to Seres.

(b) [***].

1.1 **Technology Transfer**.

(c) Seres shall be responsible for providing complete and correct information regarding the Manufacture of the Products reasonably requested by Bacthera and making personnel knowledgeable about the Products and the Manufacturing process thereof reasonably

available to Bacthera upon Bacthera's reasonable request, in each case to the extent required to enable the Bacthera Personnel responsible for the Design and Construction Work and the Manufacture of the Products to perform their obligations under this Agreement ("**Technology Transfer Plan**", a draft of which is attached hereto as Exhibit 8 and shall be finalized within [***] days of the Effective Date). The Technology Transfer Plan will entail a description of the services to be provided, Product Specifications, a schedule for the completion of the technology transfer, and such other information as is necessary for the Manufacture of the Product.

(d) [***].

10.3 **Disclaimer.** Except as otherwise expressly provided herein, nothing contained in this Agreement shall be construed or interpreted, either expressly or by implication, or otherwise, as: (i) a grant, transfer or other conveyance by either Party to the other of any right, title, license or other interest of any kind in any of its Intellectual Property, (ii) creating an obligation on the part of either Party to make any such grant, transfer or other conveyance or (iii) requiring either Party to participate with the other Party in any cooperative development program or project of any kind or to continue with any such program or project.

10.4 **Confidentiality of Intellectual Property**. Intellectual Property shall be deemed to be the Confidential Information of the Party owning such Intellectual Property. The protection of each Party's Confidential Information is described in Section 14.

11. SUBCONTRACTORS

11.1 Bacthera shall not subcontract its obligations under this Agreement (other than for the Design and Construction Work or to an Affiliate) without the prior written consent of Seres, which consent shall not be unreasonably withheld, conditioned or delayed. As of the Effective Date, Seres has given its consent to the subcontractors set forth in Exhibit 9.

11.2 [***].

11.3 Bacthera will cause each subcontractor, Affiliate, and person who is involved in the conception or development of Intellectual Property that is to be owned by Seres or is provided access to Seres' Confidential Information to sign non-disclosure and assignment of invention agreements reasonably acceptable to Seres.

11.4 Subject to Section 11.1, all Manufacturing to be provided in relation to the Product or the Design and Construction Work to be performed under this Agreement according to Exhibit 1 may be performed by Bacthera, a subcontractor or by an Affiliate of Bacthera.

12. REGULATORY AND QUALITY MATTERS

12.1 **Permits, Registrations and Licenses.**

(a) Seres will be responsible, at its expense, for obtaining, maintaining, updating and remaining in compliance with all permits, licenses and other authorizations during the Term, which are necessary or required under Applicable Laws and which are applicable to

the use and commercial distribution of Product Manufactured by Bacthera hereunder. Bacthera will provide reasonable cooperation and assistance in connection with Seres filing the applicable Marketing Approvals at the rates set forth in Section 2.5 of Exhibit 4.

(b) Bacthera will be responsible for, at its expense, obtaining and maintaining all generally required permits, registrations and licenses applicable to the Facility, including any such permits, registrations and licences applicable to the CoE and necessary for the occupancy, access and use of the Facility (other than the permits, licenses and authorizations that Seres is obligated to obtain under Section 12.1(a)), including any that are required for the performance of the Design and Construction Work and to the production of pharmaceutical and biological products generally to the extent required for Bacthera to carry out its regulatory and Manufacturing obligations hereunder.

(c) Additional requirements for permits, licenses and other authorizations relating to the design and construction of the Facility, any other relevant areas for Manufacturing of the Products and any other common areas inside the CoE are set forth in Exhibit 1.

12.2 **Quality Agreement.** At least [***], the Parties shall agree in writing to a Quality Agreement. [***]. The Quality Agreement is intended to supplement this Agreement and shall be incorporated in this Agreement in its entirety, except that in the event of a conflict between any term, condition or provision of this Agreement and any term, condition or provision of the Quality Agreement, the applicable term, condition or provision of the Quality Agreement shall control unless specifically set forth otherwise in this Agreement or otherwise agreed in writing by the Parties.

12.3 **Facility Audits**. Representatives (including internal and external auditors) of Seres and its Affiliates (a) shall, upon Seres' request, be permitted to review Bacthera's quality system records, including, without limitation, quality control and standard operating procedures and related documents; and (b) may at Seres' costs, during normal business hours and with reasonable advance notice, conduct a supplier audit of the Facility. Bacthera shall promptly remedy or cause the remedy of any deficiencies that may be noted in any such audit. The time spent by Bacthera Personnel in connection with Seres' audits of the Facility in excess of one per twelve (12) month period (excluding inspections by Regulatory Authorities) shall be charged at a daily rate of [***].

12.4 **Inspections by Regulatory Authorities**. Seres shall give Bacthera advance notice, to the extent that advance notice is given to Seres, of any site visit to the Facility by any Government Authority, the purpose of which is to inspect the Manufacture of any Product or the compliance status of the Facility under Applicable Law, in accordance with the terms and conditions of the Quality Agreements. In any event, Bacthera shall advise Seres of the occurrence of any such visit immediately upon such visit, including visits that are unrelated to the Products and any safety or environmental inspections, and Bacthera shall furnish to Seres all material information supplied to, or supplied by, any Government Authority, including the Form 483 (and foreign equivalent) observations and responses, to the extent that such information relates to such Product or the ability of Bacthera to comply with the terms of this Agreement or Applicable Law. In addition, and without limitation on the foregoing, to the extent permitted by the applicable Government Authority, representatives of Seres shall be permitted to participate as observer or active as subject matter expert if required in any such site visit by a Government Authority, and Bacthera shall provide Seres with a reasonable opportunity to review and comment upon any response to

the Government Authority to the extent the response relates to Product prior to delivery to the Government Authority.

12.5 **Adverse Event Reporting**. Seres shall be responsible for reporting adverse events and complaints with respect to any Product (including the Materials), and for responding to any such reports and complaints, in accordance with the terms and conditions of the applicable Quality Agreement. Bacthera shall promptly notify Seres of any information Bacthera receives related to an adverse event or complaint.

12.6 **Recalls**. In the event Seres is required to recall any Product, or elects to institute a voluntary recall, Seres will be responsible for coordinating such recall. Seres will promptly notify Bacthera of such recall and provide Bacthera with a copy of all documents relating to such recall. Bacthera will cooperate with Seres in connection with any recall, at Seres' expense, unless the recall is determined to have been necessitated by [***] to perform the Manufacturing activities at issue in accordance with Applicable Law or this Agreement. [***] will be responsible for all of the costs and expenses of recalls (including but not limited to costs associated with receiving and administering the recalled Product and notification of the recall to those persons whom [***] deems appropriate), except for recalls determined to have been necessitated by [***] to perform the Manufacturing activities at issue in accordance with Applicable Law or this Agreement, in which case [***] will be responsible for all of the costs and expenses of such recalls to the extent caused [***] to perform Manufacturing activities at issue in accordance with Applicable Law or this Agreement.

12.7 **Health, Safety and Environmental Compliance**. All Manufacturing operations shall be performed using appropriate safety measures and containment techniques as dictated by Applicable Law and industry standards. Bacthera shall be solely responsible for implementing and maintaining health and safety procedures for the Manufacture of Product and performance of services under this Agreement and for the handling of any materials or hazardous waste used in or generated by such activities. Bacthera, in consultation with Seres, shall develop safety and handling procedures for Materials and Product; provided, however, that Seres shall have no responsibility for Bacthera's health and safety program. The generation, collection, storage, handling, transportation, movement and release of hazardous materials and waste generated in connection with the Manufacture of Product and other services under this Agreement shall be the responsibility of Bacthera at Bacthera's cost and expense, unless otherwise agreed to in writing by the Parties for special situations or conditions. Without limiting other legally applicable requirements, Bacthera shall prepare, execute and maintain, as the generator of waste, all licenses, registrations, approvals, authorizations, notices, shipping documents and waste manifests required under Applicable Law. Bacthera shall promptly notify Seres of any significant safety or environmental issues discovered by Bacthera (whether or not in connection with a visit by Regulatory Authorities).

12.8 **Distribution.** In the event that Seres seeks to distribute Product, including as an investigational medicinal product, Seres will be responsible at its own expense for obtaining all permits, licenses and other authorizations required by Applicable Law to distribute Product in the applicable jurisdiction.

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13. CHARGES, INVOICING, PAYMENT AND TAXES

13.1 **Charges**.

The Charges under this Agreement (and permitted and required adjustments thereto) are set forth in Exhibit 4.

13.2 **Invoicing**.

(a) Bacthera shall promptly invoice Seres for the Suite Fee under Exhibit 4 on a monthly basis in arrears or Milestone Payments under Section 11.1 of Exhibit 1 upon achievement of the milestone. The invoice for the Suite Fee must be issued by the first Business Day of each month. Bacthera shall send invoices to [***].

(b) Bacthera shall invoice Seres for the Additional Batch Fee for each Batch in accordance with Exhibit 4 upon Release of the Batch.

13.3 **Payment Terms**. Except as otherwise stated in Exhibit 4, Seres shall pay all undisputed amounts pursuant to this Agreement within [***] days after receipt of an invoice therefor from Bacthera by direct wire transfer of Swiss Francs in immediately available funds in the requisite amount to [***].

13.4 **Disputed Amounts**. [***].

13.5 **Payment Default**. If Seres fails to pay any undisputed invoice on the due date, interest shall accrue on any amount overdue at the Interest Rate on a day-to-day basis until full payment. If such payment exceeds [***] and Seres fails to pay within [***] days after notice of non-payment, Bacthera may, at its sole discretion, and without prejudice to any other of its accrued rights, be entitled to suspend the provision of the Manufacture and or delivery of Product until all undisputed amounts that are overdue have been paid in full, including the Interest Rate.

13.6 **Taxes.**

(a) *Retained Taxes*. Each Party will be responsible for the payment of any taxes, levies and charges on its own personal and real property, business and franchise and privilege taxes on its business, and for taxes based on its net income or gross receipts ("**Income Taxes**"), in each case that are imposed by applicable Government Authorities (collectively, the "**Retained Taxes**"). If required by Applicable Law, Seres will be entitled to withhold an amount in respect of any Income Tax from any payment to Bacthera only to the extent Bacthera does not benefit of any exemption of withholding tax under applicable tax treaties or to the limit of any reduced withholding tax Bacthera may benefit under applicable tax treaties. Seres shall inform Bacthera in writing in advance of any such required tax withholding, as well as of any reduced withholding tax or exemption of withholding tax Bacthera may benefit under applicable tax treaties and the respective formalities, and Bacthera shall provide applicable internal revenue service forms or other tax authority forms to ensure that any withholding tax treaty benefits qualifications are met. If any amounts in respect of Income Taxes are withheld by Seres, Seres shall pay such

amounts over to the applicable Governmental Authority and provide documentation to Bacthera evidencing such payment.

(b) *Export/Import Taxes*. Seres shall be responsible for the taxes, duties, tariffs, consular fees, levies, penalties, and other charges (other than VAT, as defined in Section 13.6(d)) imposed by applicable Governmental Authorities on the import or export of the Products ("**Export/Import Taxes**") to the extent such Party is responsible for such amounts in accordance with the Incoterms® 2020 delivery terms set forth in Section 9.8.

(c) *Other Taxes*. Seres shall be responsible for all goods, VAT(as defined in Section 13.6(d)) , sales, use, consumption and other similar taxes, levies and charges (other than Retained Taxes and Export/Import Taxes) imposed by applicable Governmental Authorities in connection with the delivery of the Products to Seres or any invoice to the extent that such taxes, levies or charges cannot be recovered by Bacthera (or representative member of any group of which Bacthera forms part for VAT purposes) from the applicable Governmental Authorities. If Bacthera is required to pay any part of such taxes, levies and charges, Seres shall reimburse Bacthera for such taxes, levies and charges. Notwithstanding the foregoing, Seres will not be responsible for any VAT (and therefore any payments by Seres under this Agreement will be inclusive of VAT) to the extent that such VAT is not recoverable by Bacthera (or representative member of any group of which Bacthera forms part for VAT purposes) but which would have been recoverable by it (or representative member of any group of which it forms part for VAT purposes) had it qualified as an importer of Materials and other goods imported to Switzerland under this Agreement for the purposes of Swiss import VAT (art. 51 Swiss Federal Act on Value Added Tax (SR 641.20)).

(d) VAT.

(i) Value Added Tax ("**VAT**") means (i) on Swiss territory the value added tax (VAT) which is levied in accordance with the Federal Act on Value Added Tax (SR 641.20) and the Ordinance on Value Added Tax (SR 641.201), (ii) within the European Union, such Tax as may be levied in accordance with (but subject to derogations from) the Directive 2006/112/EC and (iii) outside the European Union, any Tax levied by reference to added value, sales and/or consumption.

(ii) Each Party intends and expects that to the extent that Bacthera (or its Affiliate) makes any supply of Product or any other supply of goods and services to Seres under this Agreement that is within the scope of VAT, such a supply will be zero rated for VAT purposes; and

(iii) Each Party agrees that to the extent that a supply of Materials is subject to a charge to import VAT, Bacthera expects to reclaim any such VAT as input tax and will use Commercially Reasonable Efforts to maximize its VAT recovery position.

(e) *Cooperation*. Each Party shall cooperate, as reasonably requested by the other, to minimize the amount of all amounts payable to Government Authorities under this Section 13.6, including by claiming any available exemption or any available refund, credit

or other recovery, and by executing and filing any invoices, forms or certificates reasonably required, in each case, to the extent that doing so would not adversely and materially affect such Party.

13.7 **Audits.** Bacthera shall maintain full and accurate financial records pertaining to amounts invoiced under this Agreement on a consistent basis and in accordance with [***]. Bacthera shall maintain such records for three (3) years after their creation or such longer period as may be required under Applicable Law. Such records shall include all invoices (including invoices from subcontractors) and the original documentation for any out-of-pocket expenses incurred in connection with this Agreement. Upon Seres' request, Bacthera will provide Seres or its independent auditor with access to financial records and other documentation and information (including third party invoices and any other amounts paid or incurred by Bacthera that are paid directly or indirectly by Seres under this Agreement) as reasonably necessary for Seres to verify the accuracy of invoices.

13.8 **Foreign Corrupt Practices Act**. The Parties confirm that any compensation payable hereunder does not constitute remuneration or other means to attempt to corruptly influence any person to act in his official capacity to assist either Seres or Bacthera in obtaining or retaining business in violation of the U.S. Foreign Corrupt Practices Act, the UK Bribery Act, any Applicable Laws enacted to implement the Organisation for Economic Co-operation and Development (OECD) Convention on Combating Bribery of Foreign Officials in International Business Transactions or other Applicable Laws relating to bribery, corruption, kick-backs or other improper payments ("**Anti-Corruption Laws**"). In connection with each Party's obligations under this Agreement, neither Seres nor Bacthera has made or offered, or hereafter will make or offer, directly or indirectly, any payment or inducement to any person with the intent to corruptly influence such person to act in his official capacity to assist either Seres or Bacthera in obtaining or retaining business in violation of applicable Anti-Corruption Laws. In connection with this Agreement, neither Party will give to or accept from any other person anything of value in order to obtain an improper business advantage. Any breach of the foregoing provision will be deemed a material breach of this Agreement that is not capable of relief and will entitle the nonbreaching Party to terminate this Agreement with immediate effect.

14. CONFIDENTIALITY

14.1 **Confidential Information**. In connection with this Agreement, Seres may disclose certain confidential information that is Seres Intellectual Property to Bacthera and its Affiliates and Bacthera may disclose certain confidential information that is Bacthera Intellectual Property and Licensed Know-How to Seres (such confidential information, "**Confidential Information**"). Without limiting the foregoing, the terms of this Agreement and the information shared thereunder are the Confidential Information of both Parties and shall be treated confidentially by each of the Parties, subject to the exceptions set forth in Section 14.6. In addition, [***] and shall be treated confidentially by Bacthera and the Bacthera Personnel. Information that was exchanged by the Parties prior to the Effective Date pursuant to the Confidential Disclosure Agreement shall be governed by such Confidential Disclosure Agreement, provided that any such information that is subsequently exchanged by the Parties under this Agreement shall, from that time, be governed by the terms of this Agreement.

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is both (i) not material and (ii) the type that the Registrant treats as private or confidential.

14.2 **Restrictions**. A Party and its Affiliates (the "**Receiving Party**") that receives Confidential Information from the other Party and its Affiliates (the "**Disclosing Party**") shall keep all of the Disclosing Party's Confidential Information in confidence with the same degree of care with which the Receiving Party holds its own Confidential Information (but in no event use less than Commercially Reasonable Efforts to prevent unauthorized disclosure). A Receiving Party shall not use the Disclosing Party's Confidential Information except in connection with the performance of its obligations and exercise of its rights under this Agreement.

14.3 **Exceptions**. The obligations of confidentiality and restrictions on use of Confidential Information under Section 14.2 do not apply to any information that the Receiving Party can prove by competent written evidence: (a) is now, or hereafter becomes, through no act or failure to act on the part of the Receiving Party, generally known or available to the public; (b) is known by the Receiving Party at the time of receiving such information, other than by previous disclosure of the Disclosing Party, or its Affiliates, employees, agents, consultants, or contractors; (c) is hereafter furnished to the Receiving Party without restriction by a third party who has no obligation of confidentiality or limitations on use with respect thereto, as a matter of right; or (d) is independently discovered or developed by the Receiving Party without the use of Confidential Information belonging to the Disclosing Party. Specific information shall not be deemed to be within any of the foregoing exclusions merely because it is embraced by more general information falling within those exclusions.

14.4 **Permitted Disclosures**. The Receiving Party may disclose Confidential Information belonging to the Disclosing Party as expressly permitted by this Agreement or if and to the extent such disclosure is reasonably necessary in the following instances:

(a) prosecuting or defending disputes between the Parties;

(b) Regulatory Filings for a Product;

(c) complying with Applicable Laws, including securities laws;

(d) disclosure to its and its Affiliates' employees, consultants, contractors, subcontractors and agents, and to sublicensees upon informing the Disclosing Party in writing, in each case on a need-to-know basis in connection with the Manufacture (and in the case of Seres as Receiving Party, importing, exporting, offering for sale, selling, commercialization, or other exploitation) of the Products, in each case under written obligations of confidentiality and, except as necessary for the provision of the Manufacture under this Agreement, non-use at least as stringent as those herein; and

(e) [***].

Notwithstanding the foregoing, if a Party is required to make a disclosure of the other Party's Confidential Information pursuant to Section 14.4(b) or (c), it shall, except where impracticable, give reasonable advance notice to the other Party of such disclosure and use efforts to secure confidential treatment of such Confidential Information at least as diligent as such Party would use to protect its own Confidential Information, but in no event less than Commercially Reasonable Efforts . Any information disclosed pursuant to Section 14.4(b) or (c) remains

Confidential Information and subject to the restrictions set forth in this Agreement, including the foregoing provisions of this Section 14.4.

14.5 **Public Domain Information and Residual Knowledge**. Nothing in this Agreement shall prevent a Party from using any know-how that is in the public domain. A Party shall also not be restricted under, and shall not be in breach of, this Agreement from using, within or outside this Agreement and for any purpose, any general knowledge, skill, and expertise acquired by its employees (or its Affiliates' employees) in their performance of this Agreement ("**Residuals**") solely to the extent such Residuals shall have been retained in the unaided memory (without intentional memorization) of such employees in intangible form and without use by the Party or such employees of tangible copies of any Confidential Information of the other Party; provided that this provision will not be deemed in any event to provide any right to infringe the patent rights of the other Party or of third parties that have licensed or provided materials to the other Party; provided, further, that a Party's use of such Residuals is on an "as is, where is" basis, with all faults and all representations and warranties disclaimed and at such Party's sole risk.

14.6 **Disclosure of Agreement**. Notwithstanding the foregoing, either Party or its Affiliates may disclose the relevant terms of this Agreement: (a) to the extent required or advisable to comply with the rules and regulations promulgated by the U.S. Securities and Exchange Commission or any equivalent governmental agency in any country in the territory where the Product is sold, provided that such Party shall submit a confidential treatment request in connection with such disclosure and shall submit with such confidential treatment request only such redacted form of this Agreement as may be mutually agreed in writing by the Parties; (b) upon request from a Governmental Authority (such as a tax authority), provided the Disclosing Party uses reasonable efforts to ensure the Governmental Authority maintains such terms as confidential; [***].

14.7 **Publication**. Seres shall be entitled to issue scientific publications and make presentations with respect to the Products, and their Manufacture without approval by Bacthera, and Seres shall be in control of any publications or scientific presentations regarding the Products or their Manufacture (including testing) subject to this Section 14.7, provided that no Confidential Information of Bacthera or its Affiliates is being shared in such publications and presentations without Bacthera's or its Affiliates prior written consent. Bacthera shall not issue any scientific publications regarding the Products or their Manufacture (including testing) without Seres' prior written consent, which shall not be unreasonably withheld.

15. REPRESENTATIONS, WARRANTIES, UNDERTAKINGS AND COVENANTS

15.1 **By Each Party**. Each Party represents, warrants, undertakes and covenants to the other that: (i) it is duly organized and validly existing under the laws of the jurisdiction of its incorporation and has full corporate power and authority to enter into this Agreement; (ii) it has all necessary power and authority to execute and deliver this Agreement to perform its obligations hereunder and to consummate the transactions contemplated hereby; (iii) its execution and delivery of this Agreement have been duly and validly authorized by all necessary action, and no other proceedings on its part are necessary to authorize this Agreement or to consummate the transactions contemplated hereby; and (iv) this Agreement has been duly authorized and validly executed and delivered by it and constitutes a legal, valid and binding obligation on it, enforceable against it in accordance with the terms of this Agreement.

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is both (i) not material and (ii) the type that the Registrant treats as private or confidential.

15.2 **By Bacthera (Manufacturing)**. Bacthera represents, warrants, undertakes and covenants that: [***].

15.3 **By Bacthera (Design and Construction Work)**. Bacthera represents, warrants, undertakes and covenants that:

(a) [***];

(b) [***];

(c) [***]; and

(d) [***].

15.4 **By Bacthera (Importing)**. Bacthera represents, warrants, undertakes and covenants that [***].

15.5 **By Seres**. Seres represents, warrants, undertakes and covenants that: [***].

15.6 **Disclaimer of Warranties.** EXCEPT AS SPECIFICALLY SET FORTH IN THIS SECTION 15, NEITHER PARTY MAKES ANY REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR USE, NON-INFRINGEMENT AND ANY OTHER STATUTORY WARRANTY.

16. **INDEMNIFICATION**

16.1 **Indemnification by Seres**. Seres shall indemnify, defend and hold Bacthera and its Affiliates, and their respective agents, employees, officers and directors (the "**Bacthera Indemnitees**") harmless from and against [***]; provided, however, that Seres' obligations pursuant to this Section 16.1 will not apply to the extent such claims or suits result from the acts or omissions of any of the Bacthera Indemnitees.

16.2 **Indemnification by Bacthera**. Bacthera shall indemnify, defend and hold Seres and its Affiliates, and their respective agents, employees, officers and directors (the "**Seres Indemnitees**") harmless from and against [***]; provided, however, that Bacthera's obligations pursuant to this Section 16.2 will not apply to the extent such claims or suits result from the acts or omissions of any of the Seres Indemnitees.

16.3 **Notification of Claim**. A Party seeking indemnification shall: (a) promptly notify ("**Claim Notice**") the indemnifying Party as soon as it becomes aware of a claim or suit for which indemnification may be sought pursuant hereto (provided that the failure to give a Claim Notice promptly shall not prejudice the rights of an indemnified Party except to the extent that the failure to give such prompt notice materially adversely affects the ability of the indemnifying Party to defend the claim or suit); (b) cooperate with the indemnifying Party in the defense of such claim or suit, at the expense of the indemnifying Party; and (c) if the indemnifying Party confirms in writing to the indemnified Party its intention to defend such claim or suit within ten (10) days after receipt of the Claim Notice, permit the indemnifying Party to control the defense of such claim or suit, including without limitation the right to select defense counsel; provided that if the indemnifying Party fails to (i) provide such confirmation in writing within the ten (10) day period; or (ii) diligently

and reasonably defend such suit or claim at any time, its right to defend the claim or suit shall terminate immediately upon ten (10) days' written notice to the indemnifying Party and the indemnified Party may assume the defense of such claim or suit [***]. In no event, however, may the indemnifying Party [***]. Seres shall promptly notify Bacthera in writing if it receives or is notified of a formal written claim from a third party that Seres Information and/or Seres Intellectual Property or that the use by Bacthera thereof for the provision of the Manufacturing process infringes, misappropriates or violates (as the case may be) any proprietary or Intellectual Property or other rights of any third party.

17. DISPUTE RESOLUTION

Any dispute between the Parties arising out of or relating to this Agreement, including with respect to the interpretation of any provision of this Agreement and with respect to the performance by a Party, shall be finally settled as provided in this Section 17.

17.1 **Informal Dispute Resolution**.

(a) Any claim or dispute between the Parties arising out of or relating to this Agreement shall be resolved as follows:

(i) First by the JSC; then

(ii) If the JSC cannot resolve the claim or dispute within [***], either Party may escalate the matter to the Chief Executive Officers of each Party; then

(iii) If the Chief Executive Officers cannot resolve the claim or dispute within [***], either Party may escalate the matter to their respective boards of directors.

(b) If a claim or dispute is not resolved within [***] days after the matter has been provided to the board members using the procedures set out in Section 17.1(a), and if either Party so chooses, the claim or dispute shall be finally settled as set out in Section 17.2.

(c) This Section 17.1 shall not preclude either Party from obtaining equitable relief on an urgent basis from a court of competent jurisdiction or from avoiding the lapse of a contractual or statutory limitations period pending the decision of the arbitrator.

17.2 **Formal Dispute Resolution**.

(a) Each Party hereto agrees to submit to the exclusive jurisdiction of the [***] for any dispute of whatsoever nature which arises out of or in connection with this Agreement, including any dispute as to the validity, existence, enforceability, interpretation, application, implementation, breach, termination or cancellation of this Agreement or as to the Parties' rights and/or obligations in terms of this Agreement or in connection with any documents furnished by the Parties in terms of this Agreement, which are not resolved in the manner referred to in Section 17.1 (each, a "**Proceeding**"). Each Party further agrees (a) to commence any Proceeding arising out of or relating to this Agreement or the transactions contemplated by this Agreement only in the Specified Courts; (b) to waive any objection to the laying of venue of any Proceeding arising out of or relating to this

Agreement or the transactions contemplated hereby in the Specified Courts; and (c) to waive and not to plead or claim that any such Proceeding brought in any of the Specified Courts has been brought in an inconvenient forum; provided, however, that such submission to the jurisdiction of the Specified Courts is solely for the purpose referred to herein and shall not be deemed to be a general submission to the jurisdiction of such courts or any other courts other than for such purpose.

17.3 **[***].** [***].

17.4 **Obligation to Perform**. Subject to each Party's termination rights hereunder and Seres' right to withhold disputed amounts, each Party shall continue to perform its obligations under this Agreement during a dispute.

18. **TERM AND TERMINATION**

18.1 **Term**. The initial term of this Agreement commences on the Effective Date and continues until the 10th anniversary of the earlier of the (a) CQV Completion or (b) commencement of Manufacturing, unless earlier terminated in accordance with this Section or extended for a Termination Assistance Period (the "**Initial Term**", and, together with the Initial Renewal Term and Additional Renewal Term(s), the "**Term**"). Thereafter, Seres may extend the Term for an additional three-year period (the "**Initial Renewal Term**"). After the Initial Renewal Period, the Term shall automatically extend for additional three-year periods (each, an "**Additional Renewal Term**") on the terms and conditions then in effect, unless either (i) Seres provides notice two (2) years before the end of the Term of its intent not to renew or (ii) Bacthera, at least thirty-six (36) months prior to the end of the Initial Renewal Term or the applicable Additional Renewal Term, notifies Seres of Bacthera's intention to terminate the Agreement, in which case, this Agreement will terminate at the end of the then-current Term. No termination charges other than the charges in Section 18 shall be applicable to any termination or the expiration of the Initial Term, the Initial Renewal Term or any Additional Renewal Term.

18.2 **Termination for Cause**.

(a) Upon written notice to Bacthera, Seres may terminate this Agreement in its entirety or with respect to a Product if:

(i) [***];

(ii) [***];

(iii) [***];

(iv) [***];

(v) [***]; or

(vi) [***].

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is both (i) not material and (ii) the type that the Registrant treats as private or confidential.

(b) Upon written notice to Seres, Bacthera may terminate this Agreement immediately in its entirety or with respect to a Product if:

(i) [***];

(ii) [***].

(iii) [***].

(iv) Seres [***].

18.3 **Termination for Convenience**. Seres may terminate this Agreement in whole or in part for convenience upon [***].

18.4 **Consequences of Termination or Expiration**. Any termination or expiration of this Agreement shall be accomplished without penalty and shall not relieve or release either Party from any rights, liabilities or obligations that may have accrued under Applicable Law or this Agreement. In the event of any such termination or expiration, the requirements set forth in this Section shall apply.

(a) If the Agreement is terminated prior to the applicable Term, Seres shall pay the applicable Charges for the Purchase Orders [***] as of the last day of the Term to the extent Manufactured and delivered in accordance with Applicable Law and this Agreement. To the extent payable under Exhibit 4, Seres shall pay the Cancellation Fee for all Purchase Orders and the respective Batches that cannot be irrevocably cancelled. [***].

(b) In the case of a termination, in addition to all other amounts payable under this Section 18.4, Seres shall reimburse Bacthera for all documented and reasonable out-of-pocket costs to which Bacthera has irrevocably committed as of the effective date of termination [***].

(c) Within [***] days after the effective date of termination or expiration, Bacthera shall deliver to Seres or destroy, as directed by Seres, all unused Materials ordered and paid for by Seres that are not required by Bacthera to meet its obligations under this Agreement. [***].

(d) Seres shall reimburse Bacthera for all unrecovered capital expenses incurred by Bacthera in support of Seres, including fixtures in the Facility that are required solely for the Manufacture of the Products hereunder [***].

(e) Upon termination or expiration of this Agreement, Bacthera will make all equipment (other than fixtures) in the Facility available to Seres for removal and shall reasonably cooperate with Seres' efforts to de-install, package, remove and ship such equipment at Seres' expense.

(f) Seres shall pay all third-party costs reasonably required for decommissioning and decontamination of the Facility in accordance with Applicable Law. Bacthera shall use Commercially Reasonable Efforts to support the decommissioning and decontamination activities so that they are completed as quickly as practicable.

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is both (i) not material and (ii) the type that the Registrant treats as private or confidential.

(g) If there is a termination of the Agreement prior to the expiration of the Initial Term, Seres shall continue to pay the applicable Suite Fee under Exhibit 4 during the Ramp-Down Period [***]. The "**Ramp-Down Period**" shall be [***] months in the case of a termination by Seres under Section 18.2(a)(v) or 18.3, and for any other termination by Seres, the earlier of (i) the date on which Bacthera notifies Seres that it has vacated the Facility and completed decontamination or decommissioning or (ii) [***] after such a termination.

(h) Seres can only place Purchase Orders with a Delivery Date prior to the effective date of expiration of the Term. If the Agreement is terminated by Seres, Seres can only place Purchase Orders with a Delivery Date that is earlier than [***] prior to the end of the Ramp-Down Period. Bacthera will fill all Purchase Orders placed in accordance with this Section 18.4(h).

(i) On the effective date of termination or expiration, the applicable rights granted to either Party in Section 14 shall terminate and eitherParty shall (i) deliver to the other Party a current copy of that other Party's Intellectual Property and other Confidential Information in the form in use as of such date; and (ii) destroy or erase all other copies of the other Party's Intellectual Property and Confidential Information in the possession of the other Party or its agents. Either Party shall, upon the other Party's request, certify in writing to the other Party, in a form acceptable to that other Party and executed by an authorized officer of the Party, that all such copies have been destroyed or erased.

(j) The Parties shall reasonably cooperate to document a copy of all the Bacthera Intellectual Property necessary for the Manufacture of the Products, in the form in use as of the date of termination or expiration of this Agreement.

18.5 **Termination Assistance**. If this Agreement terminates or expires, in whole or in part, for any reason, Seres may require Bacthera, during the Termination Assistance Period, to:

(a) [***];

(b) provide complete and correct information regarding the Manufacture of the Products reasonably requested by Seres or another supplier designated by Seres and making Bacthera Personnel who are knowledgeable about the Manufacturing process thereof reasonably available to Seres or such supplier upon Seres' reasonable request, in each case to the extent required to enable Seres or its designated supplier who are assuming responsibility for the Manufacture of the Products to do so; and

(c) perform any other activities reasonably requested by Seres to transfer the Manufacture of the Products to Seres or another supplier (the activities in clauses (a) through (c) in this Section 18.5, the "**Termination Assistance Activities**").

During a Termination Assistance Period, the Termination Assistance Activities shall be of the same quality, level of performance and scope as provided prior to termination, but not less than as required under the Agreement. Bacthera shall invoice the Termination Assistance Activities at the rates set forth in Section 4.3 of Exhibit 4 ("**Termination Assistance Charges**").

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is both (i) not material and (ii) the type that the Registrant treats as private or confidential.

18.6 **[***].**

(a) [***].

(b) [***].

(c) [***].

(d) [***].

18.7 **Survival**. Sections [***] shall survive the expiration or termination of this Agreement.

19. **INSURANCE**

19.1 The Parties acknowledge that at the time of signing this Agreement they are not yet in a position to reach an agreement on the subject of insurance due to the fact that the Parties are currently reviewing their respective insurance policies. Therefore, they agree to reach an agreement in good faith at the appropriate time.

19.2 Bacthera or its Affiliates shall provide the following insurance coverage [***].

(a) [***];

(b) [***].

19.3 [***], each Party shall obtain and thereafter provide for appropriate property insurance coverage in respect of [***].

19.4 The foregoing insurance coverage shall be primary and non-contributing with respect to any other insurance or self-insurance that may be maintained by the other Party and its Affiliates. [***]. The Party required to maintain such insurance shall cause its insurers to issue a certificate of insurance from the applicable insurer that evidences that the coverage and policy endorsements required under this Agreement are maintained in force. The insurers selected by Bacthera shall have an [***] rating of [***].

19.5 In the event that any of the required policies of insurance are written on a claims-made basis, then such policies shall be maintained during the entire Term and for a period of not less than [***] years following the termination or expiration of the Term. During the Term and such [***] year period, the Party required to maintain insurance shall use Commercially Reasonable Efforts not to permit any insurance set forth in Section 19.2 or Section 19.3 to be reduced, expired or cancelled without the prior written consent of the other Party.

20. **MISCELLANEOUS**

20.1 **Independent Contractors**. This Agreement does not create a joint venture, partnership, employment relationship or other agency relationship between the Parties or their Affiliates. Neither Party shall be obligated with respect to any transaction, and no obligation or rights or liabilities of any kind whatsoever are created (or shall be deemed to be created) as a result of this

Agreement or any other written or oral statement or any further actions by the Parties, except in the case of this Agreement for the provisions expressly contained herein.

20.2 **Assignment**. [***].

20.3 **Third-Party Beneficiaries**. The Agreement is for the sole benefit of the Parties and their permitted assigns and each such Party intends that the Agreement shall not benefit, or create a right or cause of action in or on behalf of, any Person or entity other than the Parties, their permitted assigns, and with respect to Section 16, the Seres Indemnitees and Bacthera Indemnitees.

20.4 **Further Actions**. Each Party agrees to execute, acknowledge and deliver such further instruments and to do all such other acts as may be necessary or appropriate in order to carry out the express provisions of this Agreement.

20.5 **Force Majeure**.

(a) Neither Party shall be liable to the other Party for failure or delay in the performance of any of its obligations under this Agreement (except for payment of any amounts due under this Agreement) for the time and to the extent such failure or delay is caused by earthquake, riot, civil commotion, the adoption, application or enactment of any legal measure or order from any Governmental Authority enacted or issued after the date hereof arising out of or in connection with the coronavirus disease known as SARS-CoV-2 ("**COVID-19**"); or other act of government or state, epidemic, pandemic, war, terrorist acts, flood, fire, insurrection, embargo, prevention from or hindrance in obtaining energy or other utilities, a global supply shortage of one or more of the Facility Materials, Materials or necessary components for which there is not a reasonable substitute, or other event that is both beyond the reasonable control of the respective Party and could not be avoided through reasonable precautions ("**Force Majeure Event**").

(b) The Parties acknowledge that COVID-19 is currently causing global disruption, and Bacthera's performance under this Agreement may be affected by consequences of COVID-19, including but not limited to any measures taken by authorities, and/or the availability of human resources and raw materials, and that any such event may be deemed a Force Majeure Event.

(c) Notwithstanding the foregoing, (a) any Applicable Law in Switzerland, which is in effect immediately prior to the Effective Date ("**Relevant COVID-19 Law(s)**") shall not constitute a force majeure; (b) a Party shall not be entitled to an extension of time in the performance of any of its obligations in respect of any Relevant COVID-19 Law; (c) the effects of any Relevant COVID-19 Law shall be deemed not to prevent the performance by a Party of its obligations under this Agreement; and (d) Relevant COVID-19 Laws are a risk borne by the obligor.

(d) The Party affected by such Force Majeure Event will provide the other Party with full particulars thereof as soon as it becomes aware of the same (including its best estimate of the likely extent and duration of the interference with its activities), and will use Commercially Reasonable Efforts to overcome the difficulties created thereby and to

resume performance of its obligations as soon as practicable. If there is a Force Majeure Event, the Party affected by the Force Majeure Event is excused from any default or delay for as long as and to the extent that: (i) such circumstances prevail; (ii) the affected Party is not at fault in causing the Force Majeure Event and could not have avoided the default or delay through the use of reasonable precautions; and (iii) the affected Party continues to use its Commercially Reasonable Efforts to recommence performance.

(e) If the performance by Bacthera of any obligation under this Agreement is delayed owing to a force majeure for any continuous period of more than [***] days (or such longer period as may be agreed by the JSC), [***].

20.6 **Entire Agreement of the Parties; Amendments; Waiver; Exhibits**. This Agreement constitutes and contains the entire understanding and agreement of the Parties respecting the subject matter hereof and cancels and supersedes any and all prior and contemporaneous negotiations, correspondence, understandings and agreements, other than the Confidential Disclosure Agreement and the LOI between the Parties, whether oral or written, regarding such subject matter. No waiver, modification or amendment of any other provision of this Agreement will be valid or effective unless made in writing and signed by both Parties. A waiver by either Party of any of the terms and conditions of this Agreement in any instance will not be deemed or construed to be a waiver of such term or condition for the future, or of any subsequent breach hereof. The following Exhibits attached hereto are incorporated by reference:

EXHIBIT	TITLE
1	Design and Construction Work
2	Product Specifications
3	Seres Supplied Materials
4	Charges
5	Key Personnel
6	Direct FTE
7	Materials Acquired on Behalf of Seres
8	DRAFT Technology Transfer
9	Approved Subcontractors

20.7 **Captions**. The captions to this Agreement are for convenience only and are to be of no force or effect in construing or interpreting any of the provisions of this Agreement.

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is both (i) not material and (ii) the type that the Registrant treats as private or confidential.

20.8 **Governing Law**. This Agreement shall be governed by, and construed and interpreted, in accordance with the internal laws of [***] without giving effect to any choice of law rule that would cause the application of the laws of any jurisdiction. It is hereby agreed that the United Nations' Convention on Contracts for the International Sale of Goods shall have no application to this Agreement and it is hereby specifically excluded.

20.9 **Notices and Deliveries**. Any notice, request, delivery, approval or consent required or permitted to be given under this Agreement will be in writing and will be deemed to have been sufficiently given if delivered in person, transmitted by email (receipt verified) or by express courier service (signature required) or five (5) days after it was sent by registered letter, return receipt requested (or its equivalent), provided that no postal strike or other disruption is then in effect or comes into effect within two (2) days after such mailing, to the Party to which it is directed at its address or email address shown below or such other address or email address as such Party will have last given by notice to the other Parties.

If to Seres, addressed to:

Seres Therapeutics, Inc.
200 Sydney Street
Cambridge, MA 02139, USA
Attention: [***]

If to Bacthera, addressed to:

Bacthera AG
Hochbergerstrasse 60A
4057 Basel, Switzerland
Attention: [***]

20.10 **No Consequential Damages**. IN NO EVENT WILL ANY PARTY OR ANY OF ITS RESPECTIVE AFFILIATES BE LIABLE TO THE OTHER PARTY OR ANY OF ITS AFFILIATES FOR SPECIAL, INDIRECT, CONSEQUENTIAL OR PUNITIVE DAMAGES, WHETHER IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE [***].

20.11 **Limitation of Liability.** [***].

20.12 **Cumulative Remedies**. All rights, remedies, undertakings, obligations and agreements contained in this Agreement will be cumulative and none of them will be in limitation of any other remedy, right, undertaking, obligation or agreement of either Party.

20.13 **Severability**. When possible, each provision of this Agreement will be interpreted in such manner as to be effective and valid under Applicable Law, but if any provision of this Agreement is held to be prohibited by or invalid under Applicable Law, such provision will be ineffective only to the extent of such prohibition or invalidity, without invalidating the remainder of this Agreement. The

Parties will make a good faith effort to replace the invalid or unenforceable provision with a valid one so long as the essential benefits of this Agreement remain enforceable and obtainable.

20.14 **Counterparts**. This Agreement may be executed simultaneously in any number of counterparts, any one of which need not contain the signature of more than one Party but all such counterparts taken together will constitute one and the same agreement.

[Signature page follows]

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item (601)(b)(10). Such excluded information is both (i) not material and (ii) the type that the Registrant treats as private or confidential.

In Witness Whereof, the Parties have caused this Agreement to be executed by their respective duly authorized officers as of the Effective Date, each copy of which will for all purposes be deemed to be an original.

SIGNED BY:
FOR AND ON BEHALF OF
SERES THERAPEUTICS, INC.

/S/ ERIC D. SHAFF
NAME ERIC D. SHAFF
TITLE PRESIDENT, CEO
DATE 08 NOVEMBER 2021

SIGNED BY:
For and on behalf of
BacThera AG

/s/ [***]
Name [***]
Title [***]
Date 07 November 2021 / 11:25 CET

SIGNED BY:
For and on behalf of
BacThera AG

/s/ [***]
Name [***]
Title [***]
Date 07 November 2021 / 12:27 CET

EXHIBIT 1

DESIGN AND CONSTRUCTION WORK

1. DEFINITIONS

The following terms when capitalized in this Exhibit (including the Attachments) shall have the following meanings unless otherwise expressly provided or dictated by the context. All capitalized terms used but not defined herein shall have the meanings set forth in the Agreement.

"**Approval Matrix**" means agreed delegation of approval(s) table required for the different types of Work documentation, as may be modified or amended from time to time by mutual agreement of the Parties.

"**CQV Completion**" means the date upon which the following criteria have been met: Successful IQ/OQ completion and system acceptance.

"**Design Documents**" means the drawings, documentation and specifications in respect of the Work either (a) described in or attached to this Exhibit as Attachment A, or (b) prepared by Bacthera, its Affiliates or any subcontractor and submitted to, and approved by, Seres for use under this Agreement.

"**Environmental Law**" shall mean any Applicable Law relating in any way to the environment, and the protection, preservation or reclamation of natural resources (including without limitation any surface water, groundwater, land surface, subsurface strata, river sediment, plant or animal life, air and soil), to the release or threatened release of any Hazardous Substance, including investigation, monitoring, clean up, removal, treatment or any other action to address such release or threatened release, or to health and safety matters.

"Project Quality Management System (pQMS)" means Bacthera and its Affiliates' formalized system that documents processes, procedures, and responsibilities for achieving quality design, construction and commissioning activities.

"**Hazardous Substance**" means any waste, substance, product, pollutant or material, whether solid, liquid or gaseous, that (i) is or contains, oil, petroleum or any fraction thereof, (ii) requires removal, remediation or reporting under any environmental law, or is defined, listed or identified as a "contaminant", "pollutant", "toxic substance", "toxic material", "hazardous waste" or "hazardous substance" or words of similar meaning and regulatory effect thereunder or (iii) is toxic, corrosive, flammable, infectious, , carcinogenic, mutagenic or otherwise hazardous and is regulated as such by any governmental authority under any environmental law in Switzerland

"Project Execution Plan" means the governing document that establishes the means to execute, monitor, and control of the Work.

"**Permits**" mean any authorization, consent, approval, license, lease, ruling, permit, exemption, filing, variance, order, judgment, decree, publication, notice to, declaration of or with or regulation by or of any Governmental Authorities relating to the acquisition, ownership, occupation, construction, performance of the Work, start-up, testing, operation, maintenance or warranty of any part of the Facility. It is understood that any permit concerning the GMP

manufacturing/establishment licenses and the respective GMP certificate by any Regulatory Authority is excluded from this definition and is not in scope of this Exhibit 1.

"**Project**" means the construction of the Facility, the Facility site and all other appliances, parts, instruments, appurtenances, accessories and other property that may be incorporated or installed in or otherwise become part of any of the foregoing at any stage of development, construction or operation.

"**Project Manager**" means the responsible person for implementing the Seres Facility.

"**System Acceptance**" means the successful completion of a process for approval and release of GMP systems after successful completion of commissioning and qualification activities. Documentation requirements includes an overview of the results of the qualification, a review of all discrepancies and deviations generated as part of the qualification, including the resolution method, a clear statement as to whether the GMP system is fit for purpose, approval of effective operating procedures, maintenance, and calibration programs, and receipt of engineering turnover documentation.

"**Work**" means Design and Construction Work (as defined in the Agreement).

"**Work Scope**" shall mean all requirements for the Work, set forth in this Agreement the Design Documents.**2. GENERAL OBLIGATIONS OF THE PARTIES**

2.1 Without limiting the generality of Seres other obligations under this Exhibit, Seres' obligations are to:

(a) Provide all relevant documentation reasonably required by Bacthera regarding the Product and the Manufacturing process for the Product, to the extent relevant to the construction, fit-out and qualification of the Facility; and

(b) Provide the Seres approved and effective URS (User Requirement Specification) for all process equipment, single use equipment and QC equipment relevant for performing production of the Product. The URS shall be substantially consistent with the information provided to Bacthera prior to the Effective Date. Bacthera shall review and approve such URS.

2.2 Without limiting the generality of Bacthera's other obligations under this Exhibit, Bacthera's obligations are to:

(a) Furnish the Facility and any other area relevant for the Manufacture of the Product(s) free and clear of all Hazardous Substances according to Swiss Law existing above the ground and in the soil and assure that there shall be no legal encumbrances on the Facility and any other area relevant for the Manufacture of the Product(s) that will impede the ingress and egress of Bacthera and its subcontractors thereto and therefrom as necessary to allow the performance of the Work;

(b) Obtain all necessary Permits, licenses and other authorizations relating to the Work, (e.g. piling permit, building permit, waste water permit, environmental permit);

(c) On or before the commencement of construction of the CoE, acquire real property rights necessary for performance of the Work (e.g. rights for power lines, gas lines, water lines, waste lines, sewer lines, for any area relevant for the Manufacture of the Product(s));

(d) Perform the Work in accordance with the Work Scope and as otherwise provided in this Agreement. Without limiting the generality of the foregoing, Bacthera shall perform the Work in accordance with, and so that the Facility and any other area relevant for the Manufacture of the Product(s) meets all the requirements of, Applicable Law, Permits, Prudent Industry Practices, and the Product Specifications;

(e) Prepare and keep up to date a complete set of "as built" records of the execution of the Work, showing the "as built" locations, sizes and details of the Work as executed, with cross-references to relevant specifications, data sheets, change orders ("**Change Orders**") and amendments. Such records shall be kept on the CoE site and shall be made available for inspection by Seres, its agents and designees upon request;

(f) In accordance with the Approval Matrix, cooperate with Seres and its agents and assignees in connection with the review of any Facility Materials or Design Documents, any inspections and performance tests, and in any other matters relating to the Work;

(g) Ensure all Facility Materials and equipment provided by Affiliates and subcontractors for use in the Facility are new and unused;

(h) Arrange for the handling of all Facility Materials and storage and maintenance of such Facility Materials; and

(i) Comply with all reasonable Seres instructions, subject to Bacthera's agreement and Bacthera's right (if applicable) to issue a Change Order under Section 12.2.

3. GENERAL PROVISIONS.

3.1 **General Oversight**. As soon as reasonably practicable, Seres may maintain a staff at the construction site to perform the activities set forth in Section 2.1 hereof. During the period that Work is to be performed under this Exhibit 1, Bacthera shall provide reasonable facilities [***], including field office space at the construction site, to accommodate the Seres staff.

3.2 **Seres Not Responsible for Acts of Bacthera**. No inspection of the Work or the Design Documents, or failure to inspect the same, by Seres or any of its agents or designees shall be a waiver of Bacthera's obligations hereunder, or be construed as approval or acceptance of the Work or any part thereof. Notwithstanding the foregoing, if Seres detects any error or failure in any part of the Work, it shall inform Bacthera in order to mitigate any damage arising from such failure.

3.3 **Time for Seres Review of Design Documents.** In accordance with the Approval Matrix, Seres shall use Commercially Reasonable Efforts to inspect, review and/or approve Design Documents as soon as reasonably practicable (but in no event later than [***] Business Days or such other period of time that is reasonable under the circumstances and agreed by Seres and Bacthera) after receipt of such Design Documents by Seres.

4. FACILITY

4.1 Bacthera will design, supply, construct, commission, and test the Facility and any other area relevant for the Manufacture of the Product(s) according to and in compliance with:

(a) cGMP requirements (FDA, EMA and Swissmedic); and

(b) Applicable Laws.

5. DESIGN DOCUMENTS; PROJECT/EXECUTION PLAN.

5.1 **Initial Design Document**. The Parties have agreed on the conept report attached hereto as Attachment A for the Facility ("**Initial Design Document**"). Bacthera, its Affiliates or subcontractors shall update the Initial Design Document and Bacthera shall submit the final Initial Design Documents to Seres for its approval on or before [***].

5.2 **Key Deliverables**. Bacthera will use Commercially Reasonable Efforts to provide the following draft reports as deliverables as part of the Work on or before the date specified below, for Seres review and approval in accordance with the Approval Matrix.

"KEY DELIVERABLE"	**DATE**
Concept Report	[***]
Basis of Design	[***]
Detailed Schedule	[***]
Project Execution Plan	[***]
Validation Master Plan	[***]
Detailed Design (IFC P&IDs)	[***]

5.3 **Key Milestones**. Bacthera will use Commercially Reasonable Efforts to achieve the following milestones on or before the date specified below

"KEY MILESTONE"	**DATE**
Issue of final building permit	[***]
Start of building construction	[***]
Building weatherproof	[***]
Mechanical completion	[***]
Substantial completion	[***]
CQV Completion	[***]

5.4 **Storage**. Bacthera will provide at least the following storage for Seres for storage of the SRM, Raw Materials and Product:

(a) SRM: storage at [***] at a capacity of [***]

(b) Consumables and Raw Materials: [***] equal to [***].

(c) Product: [***] equal to [***].

6. SCHEDULES/PROGRESS REPORTS.

6.1 **General**. Within [***] days after the Effective Date, Bacthera, its Affiliates and/or subcontractors will provide a Project Execution Plan identifying the tasks to be performed by each Party in connection with the Project.

6.2 **Detailed Schedule**. A detailed schedule (the "**Detailed Schedule**") shall be developed and maintained by Bacthera its Affiliates and/or subcontractors and revised and updated not less than monthly or as otherwise agreed by the Parties. The Detailed Schedule shall include all applicable milestones with respect to the construction, completion and commissioning of the Facility. The Detailed Schedule shall incorporate and be consistent with the milestones and milestone dates above. The Key Deliverables shall be achieved per the dates provided in Section 5.2 and the Key Milestones shall be achieved per the dates provided in Section 5.3. Bacthera shall cooperate with Seres in coordinating the execution of the Detailed Schedule. Bacthera its Affiliates and/or subcontractors shall incorporate all reasonable changes to the Detailed Schedule from Seres, after approval from JSC. Bacthera, its Affiliates and/or subcontractors will resubmit the Detailed Schedule for Seres's review within [***] days of receipt of such comments from Seres.

6.3 **CQV Completion**. CQV Completion is planned for [***]. The CQV Completion may be adjusted after the Detailed Design by mutual agreement of Seres and Bacthera, the Parties acting in good faith and not unreasonably withholding such agreement.

6.4 **Progress Reports**. Monthly progress reports (each a "**Progress Report**") shall be prepared by Bacthera and submitted to Seres. Such Progress Reports shall be reviewed against Key Performance Indicators ("**KPIs**"), that are to be determined and provided by the [***] within [***]

days after the Effective Date. Bacthera shall provide the first draft of the Progress Report [***] after the Effective Date. The Progress Report will be in a Power Point format.

6.5 **Risk Register.** Bacthera will provide access to a digitally stored risk register, with the first draft being provided by [***].

7. TESTING.

7.1 **Factory Tests**. As customary or otherwise required by the Work Scope or by Prudent Industry Practices, one or more factory tests of relevant Facility Materials and equipment reasonably identified by Bacthera and approved by Seres shall be performed by Bacthera. For Seres owned process equipment, a test memo shall be issued by Bacthera to Seres in advance of the conduct of each factory test. Such memo shall describe the test to be performed, the applicable item of Facility Material or equipment being tested, the standards and method of testing, and the testing facility's capabilities and shall state a proposed test date (each a "**Factory Acceptance Tests**" or "**FAT**"). If Seres or its agent attends such test, Bacthera shall provide the results of such required tests to Seres and its agent within [***] days of the completion of each such test. If Seres and its agent do not attend such test, whether the test has been successfully completed shall be determined from Bacthera's test certificates to be provided by Bacthera to Seres and its agent within [***] days of the test completion date. Successful completion of the applicable FAT shall be a precondition to shipment to the Facility for installation of the tested item of Facility Material or equipment as mutually determined by Bacthera and Seres.

7.2 **Performance Tests**

(a) "**Performance Tests**" will include calibrations, commissioning, site acceptance testing, installation qualification, and/or operational qualification, and/or performance qualification as required by each piece of equipment and testing requirements agreed by Bacthera and Seres.

(b) Bacthera shall submit Performance Test procedures to Seres in sufficient time to allow Seres' review and final approval of the equipment in the table below, including commencement of the applicable Performance Tests. Performance Tests of all equipment other than the equipment listed below shall be performed by Bacthera without prior approval by Seres. Unless Seres otherwise consents in writing, Bacthera must complete all applicable FAT of Facility Material and equipment, and remedy all defects or deficiencies which have been identified by such applicable FAT or otherwise, before commencing any applicable Performance Tests. Notwithstanding any other provision of this Agreement, at least [***] days prior to the commencement of any applicable Performance Tests, Bacthera shall have delivered draft as-built drawings of the Facility to Seres.

DRUG SUBSTANCE EQUIPMENT	**DRUG PRODUCT EQUIPMENT**
[***]	[***]

(c) Bacthera shall perform the Performance Tests and any reruns thereof in accordance with the applicable Performance Test procedures. Bacthera shall provide the services

necessary at the Facility site for the installation, commissioning, start-up and check-out of the Facility and the running or rerunning of the Performance Tests. Bacthera shall provide notice to Seres [***] prior to the date that Bacthera expects the Work to be ready for the Performance Tests, together with a proposed schedule for such Performance Tests and the instruments to be used during the Performance Tests. The applicable Performance Tests shall be run as soon as practicable after installation at the CoE and/or Facility.

7.3 **Correction of Performance Defects or Deficiencies**. At any time during and promptly after completion (whether or not successful) of the applicable Performance Tests (or any rerun of such tests), Bacthera shall advise Seres in writing of any defects or deficiencies that were discovered or that occurred during the applicable Performance Tests. Bacthera shall as soon as reasonably practicably commence and complete corrective measures to remedy such defects or deficiencies at [***]. All portions of the Work which contain defects or deficiencies not so corrected shall be removed from the Facility site if necessary at [***]. Both Parties shall decide in their reasonable judgment if the defects or deficiencies discovered during the applicable Performance Tests will require a re-run of such Performance Tests. [***] of any Performance Test re-run, uncovering, recovering, correcting and removing Work that contains defects or deficiencies, as well as all costs of modifying, removing, disassembling, uncovering, rebuilding, re-engineering, replacing, repairing or covering or otherwise handling all other Work affected by such defects or deficiencies or the correction thereof; provided, however, [***]. If Bacthera fails to initiate correction of Work having defects or deficiencies as soon as reasonably practicable (and in any event within twenty (20) Business Days or other time period agreed by the Parties), Seres may support the correction at [***], if the defect or deficiencies were caused by [***]. If, within [***] days of notice from Seres, Bacthera does not remove Work or initiate removal thereof, which has defects or deficiencies, Seres may after [***] after written notice to Bacthera, remove, store, sell or dispose of such defective Work, all at the expense of Bacthera, except to the extent such defect or deficiencies were caused by Seres. Bacthera shall promptly provide notice to Seres in writing that such corrective measures have been completed and shall specify in such notice the date on which the Facility will be ready for the applicable Performance Tests to be rerun.

8. COMPLETION.

8.1 **Substantial Completion**.

(a) Upon successful completion of conditions to Substantial Completion set forth in this Section 8.1 ("**Substantial Completion**"), Bacthera shall give Seres notice that Substantial Completion has occurred. Such Notice shall include a request by Bacthera that Seres issue the Substantial Completion Report in accordance with this Section 8.1. Substantial Completion shall only occur when the following conditions have been satisfied:

(i) Bacthera has performed its obligations under this Exhibit in respect of the Facility in all material respects and the Facility is free of defects or deficiencies, and has been designed, constructed, commissioned, started up, tested, maintained and is operating in accordance with the Work Scope and the other requirements of this Exhibit;

(ii) Seres shall have access to all Design Documents in respect of the Facility (excluding any redlined as-built drawings), test data, training and other technical

information required hereunder or necessary for Manufacturing at the Facility in a safe and reliable manner;

(iii) Seres has received results, confirmed by a professional engineer employed by a subcontractor listed in Exhibit 9, demonstrating that Bacthera has successfully completed the Work and equipment is installed and ready to begin Performance Testing;

(iv) All special tools (e.g. specific keys to access Facility areas and equipment) then to have been furnished in respect of the Facility pursuant to this Agreement have been delivered;

(v) The Facility is ready for normal continuous and safe operation; and

(vi) Bacthera has performed its other obligations in respect of the Facility under all other provisions of this Exhibit, and delivered all items in respect of the Facility required by this Exhibit as are then expressly required to be performed or delivered.

(b) Once all of the foregoing conditions have been satisfied (or waived by Seres), the "**Substantial Completion Date**" shall be deemed to have occurred.

9. QUALIFICATION AND ACCEPTANCE.

9.1 **Provisional Acceptance**.

(a) Upon successful completion of the Performance Tests and compliance with all other conditions to Provisional Acceptance set forth in this Section 9.1 ("**Provisional Acceptance**"), Bacthera shall give Seres notice that Provisional Acceptance has occurred. Such notice shall include a request by Bacthera that Seres issue the Provisional Acceptance Report in accordance with this Section 9.1. Provisional Acceptance shall only occur when, in addition to the conditions of 8.1, the following conditions have been satisfied:

(i) Seres has received results, confirmed by an independent engineer, employed by a subcontractor listed in Exhibit 9, demonstrating that Bacthera has successfully achieved Substantial Completion

(ii) Seres has access to the Design Documents in respect of the Facility (including redlined draft as built drawings), test data, training and other technical information to be provided on or before Provisional Acceptance, including, at a minimum, those Design Documents and related technical information reasonably required for the safe and reliable operation of the Facility;

(iii) Seres has received a written notification by the Project Manager confirming the satisfaction of each of the foregoing items in this Section 9.1; and

(iv) The qualified engineer (employed by a subcontractor listed in Exhibit 9) has certified that each of the foregoing items (and the requirements set forth therein) has been satisfied in accordance with this Exhibit.

(b) Once all of the foregoing conditions have been satisfied (or waived by Seres), the Provisional Acceptance Date shall be deemed to have occurred on the date on which all of the conditions set forth in this Section 9.1 have been achieved.

9.2 **Final Acceptance**.

(a) Bacthera shall ensure that CQV Completion and Final Acceptance of the Facility occurs no later than [***] days after the Provisional Acceptance Date. Final Acceptance shall occur only when Bacthera issues a final handover report (the "**Final Acceptance Report**"), documenting that the following conditions have been satisfied ("**Final Acceptance**"):

(i) all of the conditions for Provisional Acceptance have been met;

(ii) Bacthera has completed final clean up, final grading, final painting and insulation in respect of the Facility site and the Facility;

(iii) Bacthera has obtained all final Permits required to be obtained by Bacthera in respect of the Facility and any other area relevant for the Manufacture of the Product(s);

(iv) Bacthera made access available to Seres to the final, electronic "as built" drawings for the Facility;

(v) The Facility complies with Applicable Law.

(vi) Bacthera has delivered evidence satisfactory (as part of the Final Acceptance Report) to Seres that all liens arising out of, or in connection with, any Facility Material, equipment, the Facility, or the performance by Bacthera or any Subcontractor of the Work have been satisfied or discharged;

(vii) Bacthera has fully performed all other provisions of and delivered all items required by this Exhibit;

(viii) Seres has received a written notification by the Project Manager confirming the satisfaction of each of the foregoing items in this Section 9.2; and

(ix) a qualified engineer (employed under a subcontractor listed in Exhibit 9) has certified that each of the foregoing items (and the requirements set forth therein) has been satisfied in accordance with the Exhibit.

(b) The Final Acceptance Report shall be conclusive evidence that the Facility is in accordance with this Exhibit; provided, however, that nothing contained in this Section 9.2 shall relieve Bacthera from performing any obligations remaining under this Exhibit after Final Acceptance, including any of its warranty obligations hereunder. Once all of the foregoing conditions have been satisfied (or waived by the Seres), the Final Acceptance Date shall be deemed to have occurred on the date on which all of the conditions set forth in this Section 9.2 are first satisfied.

10. CHARGES AND PAYMENT.

10.1 Initial CapEx Target. The Charges for the Work shall be equal to the CapEx Target, as it may be adjusted under Section 10.2 or Section 12. The "**CapEx Target**" as of the Effective Date is [***]. In no event will the CapEx Target be adjusted other than for capital expenses incurred solely in connection with the Facility. Except for Seres' obligation to pay the Final CapEx Amount, Bacthera shall be responsible for all [***].

10.2 Adjustments.

(a) The CapEx Target shall be adjusted (i) upon acceptance of the final Initial Design Documents by Seres pursuant to Section 5.1 ("**First Adjustment**") and (ii) upon CQV Completion ("**Second Adjustment**"), each in accordance with this Section 10.2.

(i) *First Adjustment*. Within [***], Bacthera will propose, for review by the JSC, an updated CapEx Target to reflect any increases or decreases in the capital expenses associated with the Project. [***]. Seres shall not dispute the proposal submitted by Bacthera under this clause (i) unreasonably.

(ii) *Second Adjustment*. Within [***], Bacthera will propose, for review by the JSC, an updated CapEx Target to reflect any increases or decreases in the capital expenses associated with the Project. [***]. The CapEx Target as adjusted pursuant to this paragraph is the "**Final CapEx Amount**". Seres shall not dispute the proposal submitted by Bacthera under this clause (ii) unreasonably.

(iii) Bacthera may only include an increase of the equipment included in the Facility Materials in the calculation of the First Adjustment and Second Adjustment if it demonstrates that the equipment included in the Facility Materials set forth in the final Initial Design Document is not sufficient to meet the Approved Specifications.

(iv) Any other adjustment shall be reviewed and agreed on by the JSC

Bacthera will maintain and provide to Seres all documentation (including invoices and payments) related to the amounts included in the CapEx Target, Adjusted CapEx Target and Final CapEx Target up to date required in accordance with Section 13.7 of the Agreement.

11. PAYMENT.

11.1 **Milestone Payments**.

(a) Seres shall pay Bacthera the Final CapEx Amount (as it may be adjusted under this Agreement) upon completion by Bacthera of the applicable milestones set forth in and in accordance with the following milestone payment schedule (the "**Milestone Payment Schedule**").

MILESTONE	MILESTONE PAYMENT (CAPEX TARGET)
Contract Signature	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

(b) The above Milestone Payments will be adjusted on a pro-rata basis (as determined by the JSC) for (i) any differences (A) between the CapEx Target under Section 10.1 and the Adjusted CapEx Target; or (B) between the Adjusted CapEx Target and the Final CapEx Target; and (ii) any changes to the CapEx Target pursuant to Section 12 of this Exhibit 1.

(c) Seres may apply the Deposit against any amounts owed under this Exhibit 1.

11.2 **Progress Reports**. Bacthera shall submit a Progress Report in accordance with Section 6 as part of each invoice. In the event that Bacthera does not submit an invoice in any particular month, Bacthera shall nonetheless submit a Progress Report to Seres.

11.3 **Milestone Payments**. Seres shall review each such invoice and make payments in accordance with the Milestone Payment Schedule in Section 11.1(a).

11.4 **Effect of Payment**. Payment of the contract price or any portion thereof shall not (a) constitute Seres's approval or acceptance of any portion of the Facility Materials, equipment or Work, (b) constitute a waiver of any right or remedy Seres may have with respect to any portion of the Facility Materials or Work that has been, or subsequently is, determined not to have been delivered or performed in accordance with this Exhibit, or (c) release Bacthera from any obligation or liability hereunder.

12. CHANGES IN THE WORK BY CONTRACT, LAW OR OTHERWISE.

12.1 **General**.

(a) Seres may at any time order changes to the Work, which orders shall be subject to Bacthera's approval, which shall not be unreasonably withheld, conditioned or delayed. Bacthera its Affiliates or any subcontractors may propose changes to the Work for Seres' consideration, which changes shall be subject to Seres' approval, which shall not be unreasonably withheld, conditioned or delayed. If both Parties agree that the proposal to modify the Work pursuant to this Section 12.1(a) should be implemented, Bacthera shall issue a Change Order incorporating such proposal. Any such Change Order shall be accompanied by a proposal consisting of the contents set forth in Section 12.2 and shall include any other information either Party reasonably deems necessary to evaluate the proposed Change Order. Upon receiving such written approval, Bacthera shall diligently perform the change in strict accordance with the terms thereof. Bacthera, its Affiliates or

any subcontractors may propose to the JSC a Change Order with respect to (i) Force Majeure Events, (ii) Seres caused delays, (iii) changes in Applicable Law, (iv) Seres-directed or approved changes, and (v) any unreasonable and prolonged delays in the review or approval by Seres, its agents or designees of materials submitted for its review or approval pursuant to the terms hereof. The JSC may not withhold its consent to the proposal unreasonably. Bacthera's cost for detailing changes to the Work which were requested or otherwise caused by Seres shall be reimbursed by Seres. The Project Execution Plan will further define the specific Change Order process.

(b) Bacthera shall notify Seres and its agent as soon as practicable of any Force Majeure Event, Seres caused delay, change in Applicable Law or any other basis for a Change Order ("**Notice**"). Such Notice shall, to the extent practicable, specify the impact upon the various portions of the Work occasioned by reason of such Force Majeure Event, Seres caused delay, change in Applicable Law or any other basis for a Change Order, as applicable.

(c) Any change to the contract price, the Detailed Schedule or any other terms and conditions of this Exhibit pursuant to a Change Order shall be equitable under the circumstances.

(d) All changes in the Work shall be authorized by a written Change Order executed by Seres.

(e) Bacthera agrees that unless otherwise stated in the Change Order, and in accordance with the Project Execution Plan, the Change Order shall constitute the final and complete compensation and satisfaction for all costs and scheduled effects related to (a) the implementation of the stated changes and (b) the cumulative impact of effects resulting from the stated changes on all prior Work and changes in the Work to be performed as scheduled. [***].

(f) No Change Order shall be issued in connection with any defects or deficiencies caused by Bacthera, its Affiliates, or subcontractor in the performance of the Work hereunder.

12.2 **Change Order Pricing and Payment**.

(a) As soon as practicable after an event specified in Section 12.1 requiring a potential Change Order or after receipt from Seres of a request for a change, Bacthera shall submit to Seres a proposal for implementing the change.

(b) The proposal shall consist of: (a) a detailed cost estimate, including direct, indirect and engineering costs, fees and contingencies, each, if commercially reasonable, supported by bids for Facility Materials and/or supporting calculations and in accordance with the pricing structure set forth in this Exhibit for pricing the change; (b) revisions, if any, to the Design Documents; (c) anticipated impacts to the approved Detailed Schedule; (d) an estimate of the anticipated result; and (e) any modifications that might arise in Bacthera's warranties.

(c) Bacthera's supporting calculations shall: (a) show the estimated quantities of manpower, construction labor, subcontracts, Facility Material and equipment usage and services to be added and/or deducted by size, type and/or amount provided, (b) be based on the rates agreed by the Parties to determine price, man-hours per unit of installed Facility

Materials, equipment, rental rates and other similar cost standards, and (c) contain a breakdown for rental equipment, plant, overhead, fees and contingencies.

(d) Unless otherwise agreed by the parties, the amount paid for any Work conducted pursuant to a Change Order shall be based on a fixed price or time and materials with a not to exceed provision agreed to by Bacthera and Seres, taking into consideration any savings or costs incurred by Bacthera due to such change.

13. BONUSES.

13.1 Bonus Schedule:

(a) If [***], or

(b) If [***].

(c) If [***].

(d) If [***].

13.2 Any payments, credits or bonuses under this Section shall be reimbursed via [***].

14. QUALITY CONTROL AND INSPECTION; REJECTION OF THE WORK.

14.1 **General & Safety**. Bacthera shall perform quality control and inspection services related to the Work as required by the Project Quality Management System, this Agreement and Prudent Industry Practices. Bacthera shall perform all of its obligations hereunder in accordance with all Applicable Law.

14.2 **Inspection Rights**. Upon request and in accordance with Section 3.1, Seres and its agents or designees may: (a) make inquiries of Bacthera and visit the Facility site at any time during normal business working hours, and have access to the Work, and/or (b) maintain a staff at the Facility site, in each case to (i) familiarize itself with the progress and quality of the Work, (ii) determine whether the Work is being performed and is proceeding in accordance with this Exhibit, and (iii) witness such tests, without disrupting the Design and Construction Work. Any delay caused by activities under this Section shall be the responsibility of Seres.

14.3 **Correction of Work, Facility Material or Equipment**. Seres shall at any time have the right to reject, or to direct Bacthera to dispute, any such portion of the Work, which does not conform to this Agreement. Upon notice of such rejection, Bacthera shall respond within a reasonable period of time and as soon as practicable under the circumstances. Seres shall have the right to utilize any rejected portion of the Facility Materials, equipment or the Work at their own risk, until such time as replacement Facility Material, equipment is delivered and incorporated into the Facility. If either Party disputes the (non-)conformance of the Work, resolution will follow the escalation pathway in Section 17 of the Agreement.

Attachments

The following Attachments attached hereto are incorporated by reference:

ATTACHMENT	TITLE
A	Initial Design Document as the Concept Design Report

ATTACHMENT A

[***]

EXHIBIT 2

PRODUCT SPECIFICATIONS – INCLUDES QC SAMPLING PLANS AND TEST METHODS

[***]

EXHIBIT 3

SERES SUPPLIED MATERIALS

[***]

EXHIBIT 4

CHARGES

1. CHARGES GENERALLY

1.1 Seres shall pay Bacthera the following Charges for the Manufacture of the SER-109: the Suite Fee set forth in Section 2.1 (as it may be adjusted pursuant to Section 3), the Additional Batch Fee set forth in Section 2.2, and the Procurement Fee set forth in Section 2.3. In addition, Seres shall pay the following Charges to the extent applicable: the External Storage Charges set forth in Section 2.4, the Regulatory Support Charge set forth in Section 2.5 and any other Charges under the Agreement.

1.2 The Cancellation Fee is set forth in Section 4.2 and the Termination Assistance Charges are set forth in Section 4.3.

1.3 For purposes of this Exhibit, an "**FTE**" means [***] minus vacation and holidays).

1.4 The Base FTEs shall accurately maintain shift records up to and including the prior calendar year to document time worked. Bacthera shall provide Seres with access to such shift records upon request.

1.5 "**Year 1**" means [***], provided that [***], and all other "**Years**" mean calendar years other than the last Year of the Term, which shall commence on January 1 and end on the last day of the Term.

1.6 "**Capacity Allocation**" means, for a Year, the [***] (except that Year 0 Capacity Allocation shall be adjusted pro rata for the portion of a full calendar year it reflects).

2. PRICING

2.1 Suite Fee.

(a) The Suite Fee shall be an annual fee of [***] (as may be adjusted pursuant to Sections 3 and 5 of this Exhibit 4 or Section 13.2 of Exhibit 1) and shall be paid in 12 equal monthly instalments (except that Year 0 (2023) Suite Fee shall be adjusted pro rata for the portion of a full calendar year it reflects). For the calendar year 2023, Seres shall receive a credit of [***] which shall be applied against the Suite Fee, unless the Suite Fee in calendar year 2023 is less than [***], in which case the entire Suite Fee for 2023will be eliminated and the remainder of the difference between [***] and the Suite Fee for 2023 shall be credited against the Year 1 Suite Fee.

(b) [***] and each Year thereafter Seres shall communicate to Bacthera the planned Capacity Allocation of such Year [***]. The Capacity Allocations are as follows:

Table 1		
Capacity Allocation		
	B	**A**
Capacity Allocation 1	[***]	[***]
Capacity Allocation 2	[***]	[***]
Capacity Allocation 3	[***]	[***]
Capacity Allocation 4	[***]	[***]
Capacity Allocation 5	[***]	[***]

(c) The Suite-Fee for Year 1 and each Year thereafter shall include the number of Scale A Batches and Scale B Batches (the "**Base Batches**") set forth on Table 2 applicable to the Capacity Allocation for such Year.

Table 2										
Maximum Capacity			**Batches included in:**							
			Base Batches included in Suite Fee		**Additional Batches Tier 1**		**Additional Batches Tier 2**		**Additional Batches Tier 3**	
Capacity Allocation	**Theoretical Capacity**		**Number of Batches**		**Number of Batches**		**Number of Batches**		**Number of Batches**	
	Scale B	Scale A	Scale B	Scale A	Scale B	Scale A	Scale B	Scale A	Scale B	Scale A
Capacity Allocation 1	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]
Capacity Allocation 2	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]
Capacity Allocation 3	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]
Capacity Allocation 4	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]
Capacity Allocation 5	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]

Table 2 -Base Batches and Additional Batches

(d) If, during a Year, Seres desires to order [***], it can do so by [***]. The Capacity Allocation for Scale A and Scale B shall always sum up to be [***]%.

(e) [***]of the Suite Fee shall be invoiced on the [***] of the month following commencement of the CQV Completion or the earlier commencement of Manufacturing and shall continue each successive month thereafter throughout the Term and the Ramp-Down Period.

(f) The Suite Fee amount is independent of the number of Batches ordered per year.

(g) If the total count of Scale A Base Batches and Scale B Base Batches Released in a Year exceeds [***], Seres shall pay an additional fee (the "**Release Fee**") of [***]. There shall not be any Release Fee imposed on Batches for which there is an Additional Batch Fee.

(h) Examples of the intent of the Parties as how to apply these calculations have been provided to the Seres VP Commercial Manufacturing via email on 12.10.2021 and will be recorded at the first meeting of the JSC.

2.2 Additional Batch Fee.

(a) Seres shall pay the Additional Batch Fee for all Batches delivered in accordance with the Agreement in excess of the applicable Base Batches for the Year. There are three tiers of Additional Batch Fees for each of the Capacity Allocations, as further defined in Tables 3 and 4.

(b) [***].

(c) The Additional Batch Fee (as may be adjusted pursuant to Sections 3 and 5) for Scale B Batches and Scale A Batches are as follows:

TABLE 3 -ADDITIONAL BATCH SCALE B FEE			
YEAR	**TIER 1**	**TIER 2**	**TIER 3**
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]

TABLE 4 -ADDITIONAL BATCH SCALE A FEE			
YEAR	**TIER 1**	**TIER 2**	**TIER 3**
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]

2.3 Procurement Fee. The JSC shall set the Procurement Fee [***] prior to the commencement of each Year. The Procurement Fee shall be the [***] (the "**Procurement FTE Rate**").

2.4 External Storage Charges. [***].

MATERIAL	STORAGE SPACE INCLUDED IN SUITE FEE
[***]	[***]
[***]	[***]
[***]	[***]

2.5 Regulatory Support Charges. The Charges for complying with Seres requests for documents or other substantive requests for assistance in compiling or preparing any regulatory filing (other than for completion of the SMF and routine cGMP certification by Swissmedic); or attendance in meetings with Regulatory Authorities by Bacthera that solely relate to the Facility and the Product shall be charged to Seres on an FTE basis at [***]/day plus travel and accommodation costs.

3. ADJUSTMENTS TO THE SUITE FEE AND ADDITIONAL BATCH FEE

3.1 Initial Adjustments.

(a) [***]

[***]	[***]
[***]	[***]
[***]	[***]

]

(b) The "**Base FTEs**" for one shift are [***] FTEs and for two shifts are [***]FTEs. For avoidance of doubt, the Base FTEs for a Year reflect [***]. It is expected that [***] and [***].

(c) Subject to the limitations in Section 3.1(a) (except to the extent such increased costs are the result of Seres' acts and omissions prior to PPQ Completion, in which case the limitations of Section 3.1(a) shall not apply), the [***]. There shall be no increase pursuant to this Section 3.1(c) unless [***].

(d) [***].

(e) The Parties shall discuss and agree on the proposed adjustments under Section 3.1(c), and any agreed adjustments shall be [***]. If the Parties are unable to agree to the adjustment, either Party may treat the matter as a dispute pursuant to Section 17 of the Agreement.

3.2 Reimbursement due to change in cGMP or Applicable Law and/or Product Specifications.

(a) Without limiting the provisions of Section 3.1, if a change in the Specifications for the Product is requested by Seres or mandated by changes in Applicable Law or cGMP after the Effective Date which result in actual and material increased Manufacturing costs to Bacthera in respect of Product (i.e. higher than [***]), the Suite Fee and Additional Batch Fee shall be [***]. Allocation of [***].

(b) If a change in the Specifications for the Product result in actual decreased Manufacturing costs to Bacthera in respect of a product (i.e. lower than [***]), the Suite Fee and Additional Batch Fee shall be [***].

(c) Seres shall be responsible for any increase in Manufacturing costs in respect of the Product resulting from a discretionary change in Specifications for such Product requested by Seres. It is acknowledged and agreed that changes to the Specifications for Product shall only be made in accordance with the provisions of the Quality Agreement.

3.3 Reimbursement of Additional Utilities Costs. In the event the utility rate payable by Bacthera for any electricity used for, and necessary to, Manufacture the Products purchased by Seres increases by more than [***]% compared to the average utility rate during the period [***] to [***] days immediately preceding such increase (the "**Base Utility Rate**"), Bacthera may implement a temporary utility surcharge on the Suite Fee to recover the actual incremental costs paid by Bacthera for such utility service, but only during the period that such increased utility rate actually exceeds the Base Utility Rate. Bacthera will document all such increases that have led to, or will or may lead to, such utility surcharges applicable to Seres, and provide Seres with such documentation, along with an advance written notice of any expected utility surcharge on the Products. Seres' obligation to pay the surcharge is conditioned on Bacthera providing reasonable evidence that it has allocated utility consumption in the CoE on a fair and equitable basis among all customers so that Seres is not paying for utility consumption that does not relate to the Manufacture of the Products.

3.4 Cost Reduction.

(a) Prior to the commencement of each Year, the JSC will review the [***]. The Suite Fee and Additional Batch Fee shall be [***].

(b) The Suite Fee and Additional Batch Fee shall be [***]. Unless otherwise agreed by the JSC, the Suite Fee and Additional Batch Fee shall be reduced by [***]% of the net savings achieved by the reduction (after deducting any investments approved by the JSC and paid by either Party).

4. OTHER CHARGES

4.1 Seres Dedicated Equipment. Seres shall be responsible for the costs of procuring and implementing replacements for items of equipment dedicated to and owned by Seres in the Facility. If the replacement of such an item is required prior to the end of its useful life due to [***], Bacthera shall reimburse Seres in an amount equal to the depreciation of the original cost of the item between the date of replacement and the end of the useful life of the equipment. Otherwise Seres shall bear the cost of replacement of such item of equipment.

4.2 Cancellation Fee.

(a) [***]. If the drug substance is not able to be used in a future batch, [***].

(b) [***] (Section 2.2(c)).

(c) [***].

4.3 Termination Assistance Charges. The Charges for complying with Seres requests for Termination Assistance Activities pursuant to Sections 18.5 and 18.6 of the Agreement shall be charged on an FTE basis at [***]/day.

5. PPI ADJUSTMENT

5.1 The Suite Fee, Additional Batch Fee and the Release Fee shall be increased on a prospective basis at the end of each Year (excluding Year 0) by the change in the Index over the prior 12 month period.

5.2 The Regulatory Support Charges, the Termination Assistance Charges and Procurement FTE Rate shall be increased on a prospective basis at the end of each Year by the change in the Index over the prior 12 month period.

5.3 For purposes of this Section 5, "**Index**" means the Swiss Producer Prices Index (December 2020=100) as published by the Federal Statistical Office of Switzerland. If the Federal Statistical Office of Switzerland ceases to publish the Swiss Producer Prices Index, then either Party may provide written notice to the other Party to meet to discuss an alternate means of adjusting the Suite Fee, Additional Batch Fee and FTE rates. The Parties shall promptly meet after the date of such notice (in any event not later than 15 days after such date) to agree such alternate means.

EXHIBIT 5

KEY PERSONNEL

List of Key Personnel:

The list below is referring to Key Personnel engaged in Manufacturing the Product for Seres. More than one key position can be covered by one person, like Production Head and MSAT lead as one and same person.
[***]

EXHIBIT 6

DIRECT FTE

[***]

EXHIBIT 7

MATERIALS ACQUIRED ON BEHALF OF SERES

The Exhibit 7 Materials acquired on behalf of Seres are listed in the table below. The list shall be updated during the Term and in accordance with the Agreement. The Exhibit 7 Materials defined below represent requirements for [***] at the time of the Effective Date. [***] and any amendments of [***] will be defined prior to Manufacturing.

[***]

EXHIBIT 8

TECHNOLOGY TRANSFER

This is a draft document which outlines the Technical Transfer Concept and associated responsibilities for both Parties. The final Technical Transfer Plan will be completed and approved prior to [***].

Description of Technology Transfer Project Plan:

Seres and Bacthera are planning the commercial supply for SER-109 by transferring the Manufacturing process to the Facility. Essential services for the transfer and the process validation are [***]. This project plan describes the draft [***]. The scope reflects the current understanding of required activities for the transfer of the manufacturing process as of the Effective Date. These estimates are subject to change, as more information is developed/discovered and/or if the project plan changes. All activities of the Technology Transfer shall be performed in accordance with the Quality Agreement and cGMP.

Technology Transfer Concept

Seres and Bacthera have agreed to the Technology Transfer Concept, as described below:

- Seres will provide [***].
- Bacthera will perform [***]. Seres will provide [***].
- After [***].
- The Technology Transfer is [***].
- After successful Technology Transfer, [***]. Seres will define the [***]. Additional [***] and after agreement between Seres and Bacthera and at Seres' expenses.

Production Concept

Bacthera assumes that the manufacturing process from Seres transferred to the Facility is fully developed [***] and will be able to produce product according to specifications. The process must be implemented at Bacthera [***]. The agreed strategy is [***]. Changes to this strategy will be treated by change request procedure. The impact of such change will be [***]. In the event additional work is required, an amended proposal will be issued. Cost associated to the change will be at [***] expense.

Analytical Methods

No changes to the analytical testing scheme [***] as outlined in Exhibit 2 is assumed for the commercial manufacturing of SER-109, and Bacthera foresees the successful transfer of validated or compendial Analytical Methods to Bacthera latest by [***]. In the event that additional analytical methods will need to be implemented for the comparability study, Bacthera and Seres shall mutually agree to the scope of work and an amended proposal will be issued.

General Assumptions

- Document review and approval workflow: Following issuing of the document to Seres, the following review and approval workflow is assumed: Documents are reviewed in [***] by Seres within [***]. Afterwards, the documents are revised by Bacthera within [***] and finally sent to the customer for approval of the revisions within [***] of issue, if not agreed otherwise.
- The timeline assumes that there are no supplier-related delays for Single Use materials, and other raw materials.

- The timeline assumes a timely availability of key analytical data (some tests done by Seres) following the Engineering campaign and no major required changes of batch records prior to the Validation Campaign.
- Raw material provided by Seres (SRM) will be handled in accordance with Exhibit 2 and the Quality Agreement.
- All Exhibit 7 Materials can be sourced with a certificate for the absence of adventitious agents such as, but not limited to BSE/TSE-free, latex, gluten, and lactose free.
- PPQ-batch release readiness is achieved with successful IPCs and release testing as per commercial manufacturing sampling plan. Final release will be completed after regulatory approval is granted.
- Excess material and analytical samples generated during transfer and development phase are frozen at [***]. After [***] are discarded. For bulk material, Bacthera contacts the customer to determine which material can be (I) discarded, (II) shipped or (III) stored at Bacthera (storage fee applies). Required retains per the sample plan will be maintained per retention requirements.
- All raw data generated during the work performed in this proposal will be provided to Seres in an Excel format. Please note that the raw data provided will not be QA reviewed and is for information only.

TT Package from Sending Site (Seres)
The Tech transfer package from Seres is expected to include but not be limited to the relevant information of the following items:

- **Raw Material List**
  [***]
- **Equipment List**
  [***]
- **Utilities List**
  including specifications and estimated consumption
- **BFD manufacturing process**
  including mass balance solutions
- **Relevant physical properties, including stability of product and intermediates**
- **All relevant SOPs related to manufacturing and testing of the product**
  - In-process and release tests (SOPs, Requirements etc.)
  - Master Batch Record and Batch records (filled in) for all production steps and media / buffers
  - Validation Master Plan and Report from previous campaigns
- **Process, Cleaning and Containment strategy, Validation Reports from previous campaigns**
- **Risk assessments** (Process, Leachable Extractables, Containment, Cleaning, etc.)
- **Leachable and Extractable studies**
- **Hold studies for intermediates**

- **Mixing studies**
- **Process Data** (e.g. Golden Batch, Process robustness data, small scale data, etc.)
- **Bioburden control strategy**

Receiving Site Deliverables (Bacthera)

Deliverables from Bacthera will include but not be limited to:

- **Analytical Method Transfer Report (including Comparability Study)[3]**
- **Documentation Transfer List/Report**
- **Process / Equipment Descriptions and Critical Parameters**
- **Transfer Protocol BOM – Raw Materials Comparison**
- **Product Formulation and batch sizes**
- **Batch Records**
- **Process Validation Strategy, Plan and Reports**
- **Cleaning Validation Report[1]**
- **Risk assessments (Process, Leachable Extractables, Containment, Cleaning, etc.)**
- **Raw Material Vendor Qualification[4]**
- **Container Closure Integrity Study[2] (required for new bottles)**

[1] washer load validation is limited to non-standard (project specific) loads as is part of the pre-production activities.
[2] The scope and effort for validation of a new end-fill container (multi dose bottle) will be discussed and agreed on in a separate change note, once the specifics are defined.
[3]Shipping validation for QC samples to be shipped to Seres will be discussed and agreed in a separate change note, once the specifics are defined.
[4]Raw Material Vendor Qualification Status assessment is part of the routine set-up during pre-production.
General: The exact timing and duration of activities need to be planned for in alignment with the project schedule.

Project Timelines and Milestones

[***]

EXHIBIT 9

APPROVED SUBCONTRACTORS

As of Effective Date, not all Subcontractors are listed in Exhibit 9. List shall be amended by both Parties once Subcontractors are defined.

List of Approved Subcontractors:

Approved Subcontractors	Category / Type of Service
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-253776, 333-236824, 333-230092, 333-223514, 333-210171 and 333-205253) and Form S-3 (Nos.333-244401 and 333-237033) of Seres Therapeutics, Inc. of our report dated March 1, 2022 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP
Boston, Massachusetts
March 1, 2022

Exhibit 31.1

CERTIFICATIONS

I, Eric D. Shaff, certify that:

1. I have reviewed this Annual Report on Form 10-K of Seres Therapeutics, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant’s disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant’s internal control over financial reporting that occurred during the registrant’s most recent fiscal quarter (the registrant’s fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant’s internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant’s auditors and the audit committee of the registrant’s board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant’s ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant’s internal control over financial reporting.

Date: March 1, 2022

By: /s/ Eric D. Shaff
Eric D. Shaff
President and Chief Executive Officer
(*Principal Executive Officer*)

Exhibit 31.2

CERTIFICATIONS

I, David Arkowitz, certify that:

1. I have reviewed this Annual Report on Form 10-K of Seres Therapeutics, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant’s disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant’s internal control over financial reporting that occurred during the registrant’s most recent fiscal quarter (the registrant’s fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant’s internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant’s auditors and the audit committee of the registrant’s board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant’s ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant’s internal control over financial reporting.

Date: March 1, 2022

By: /s/ David Arkowitz
David Arkowitz
Executive Vice President, Chief Financial Officer and Head of Business Development
(*Principal Financial and Accounting Officer*)

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

I, Eric D. Shaff, President and Chief Executive Officer of Seres Therapeutics, Inc. (the "Company"), hereby certify, pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge:

(1) The Annual Report on Form 10-K of the Company for the period ended December 31, 2021 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

March 1, 2022

/s/ Eric D. Shaff
Eric D. Shaff
President and Chief Executive Officer
(*Principal Executive Officer*)

Exhibit 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

I, David Arkowitz, Executive Vice President, Chief Financial Officer and Head of Business Development of Seres Therapeutics, Inc. (the "Company"), hereby certify, pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge:

(1) The Annual Report on Form 10-K of the Company for the period ended December 31, 2021 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

March 1, 2022

/s/ David Arkowitz
David Arkowitz
Executive Vice President, Chief Financial Officer and Head of Business Development
(*Principal Financial and Accounting Officer*)