

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549**

FORM 10-Q

(Mark One)

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

For the quarterly period ended **September 30, 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: **001-38537**

AVROBIO, INC.

(Exact Name of Registrant as Specified in its Charter)

Delaware
(State or other jurisdiction of
incorporation or organization)
One Kendall Square
Building 300, Suite 201
Cambridge, MA
(Address of principal executive offices)

81-0710585
(I.R.S. Employer
Identification No.)

02139

(Zip Code)

Registrant's telephone number, including area code: **(617) 914-8420**

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, \$0.0001 par value per share	AVRO	Nasdaq Global Select Market

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, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer
Non-accelerated filer

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 is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

As of October 29, 2021, the registrant had 43,652,470 shares of common stock, \$0.0001 par value per share, outstanding.

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Summary of the Material Risks Associated with Our Business

Our business is subject to numerous risks and uncertainties that you should be aware of in evaluating our business. These risks include, but are not limited to, the following:

- We have incurred net losses since inception. We expect to incur net losses for the foreseeable future and may never achieve or maintain profitability.
- We will need additional funding, which may not be available on acceptable terms, or at all. Failure to obtain this necessary capital when needed may force us to delay, limit or terminate our product development efforts or other operations.
- Our term loan agreement contains restrictions that potentially limit our flexibility in operating our business. In addition, we may be required to make a prepayment or repay our outstanding indebtedness earlier than we expect.
- Business interruptions resulting from the ongoing coronavirus disease (COVID-19) pandemic or similar public health crises have caused and may continue to cause a disruption of the development of our product candidates and adversely impact our business.
- Our lentiviral-based gene therapy product candidates are based on a novel technology, which makes it difficult to predict the time and cost of product candidate development and of subsequently obtaining regulatory approval.
- Our product candidates and the process for administering our product candidates may cause undesirable side effects or have other properties that could delay or prevent their regulatory approval, limit their commercial potential or result in significant negative consequences following any potential marketing approval.
- Success in preclinical studies or early clinical trials may not be indicative of results obtained in later trials.
- We may find it difficult to enroll patients in our clinical trials, which could delay or prevent us from proceeding with clinical trials of our product candidates.
- We may encounter substantial delays in our clinical trials or we may fail to demonstrate safety and efficacy to the satisfaction of applicable regulatory authorities.
- Even if we complete the necessary preclinical and clinical studies, we cannot predict when or if we will obtain regulatory approval to commercialize a product candidate and the approval may be for a narrower indication than anticipated.
- Our regulatory approach for AVR-RD-01 for the treatment of Fabry disease recently changed, and there can be no assurance that any new regulatory pathway we propose to regulatory agencies will be accepted.
- Only certain of our clinical trials, including the Phase 2 clinical trial of AVR-RD-01 for Fabry disease and the Phase 1/2 clinical trial of AVR-RD-02 for Gaucher disease type 1, utilize our commercial-scale plato® platform.
- We face significant competition in our industry and there can be no assurance that our product candidates, if approved, will achieve acceptance in the market over existing established therapies. In addition, our competitors may develop therapies that are more advanced or effective than ours, which may adversely affect our ability to successfully market or commercialize any of our product candidates.
- Gene therapies are novel, complex and difficult to manufacture. We could experience production problems that result in delays in our development or commercialization programs or otherwise adversely affect our business.
- We expect to rely on third parties to conduct some or all aspects of our vector production, product manufacturing, protocol development, research and preclinical and clinical testing, and these third parties may not perform satisfactorily.
- We are dependent on a limited number of suppliers for some of our components and materials used in our product candidates.
- Third-party claims of intellectual property infringement may prevent or delay our development and commercialization efforts.
- Our rights to develop and commercialize our product candidates are subject, in part, to the terms and conditions of licenses granted to us by others. In particular, we have in-licensed certain intellectual property rights and know-how relevant to AVR-RD-01 for our Fabry program, AVR-RD-02 for our Gaucher type 1 program and AVR-RD-05 for our Hunter program, but do not own any patents or patent applications covering these product candidates.

- If we experience material weaknesses or deficiencies in the future or otherwise fail to establish and maintain effective internal controls, we may be unable to produce timely and accurate financial statements, and we may conclude that our internal control over financial reporting is not effective, which could adversely impact our investors' confidence and our stock price.

The summary risk factors described above should be read together with the text of the full risk factors below, in the section entitled "Risk Factors" and the other information set forth in this Quarterly Report on Form 10-Q, including our consolidated financial statements and the related notes, as well as in other documents that we file with the Securities and Exchange Commission (the "SEC"). The risks summarized above or described in full below are not the only risks that we face. Additional risks and uncertainties not precisely known to us, or that we currently deem to be immaterial may also materially adversely affect our business, financial condition, results of operations and future growth prospects.

Note Regarding Forward-looking Statements

This Quarterly Report on Form 10-Q contains forward-looking statements which are made pursuant to the safe harbor provisions of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”), and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). These statements may be identified by such forward-looking terminology as “aims,” “anticipates,” “believes,” “continue,” “could,” “designed to,” “estimates,” “expects,” “intends,” “may,” “plans,” “potential,” “predicts,” “strives,” “should,” or the negative of these terms or other comparable terminology. Our forward-looking statements are based on a series of expectations, assumptions, estimates and projections about our company, are not guarantees of future results or performance and involve substantial risks and uncertainty. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in these forward-looking statements. Our business and our forward-looking statements involve substantial known and unknown risks and uncertainties, including the risks and uncertainties inherent in our statements regarding:

- the impact of the ongoing COVID-19 pandemic on our clinical trial programs, clinical supply and business generally, as well as our plans and expectations with respect to the timing and resumption of any development activities that were or may be temporarily paused as a result of the COVID-19 pandemic;
- the timing, progress and results of preclinical studies and clinical trials for our programs and product candidates, including statements regarding the timing of initiation and completion of studies or trials and related preparatory work, the period during which the results of the trials will become available and our research and development programs;
- the existence or absence of side effects or other properties relating to our product candidates which could delay or prevent their regulatory approval, limit their commercial potential, or result in significant negative consequences following any potential marketing approval;
- the durability of effects from our product candidates;
- the timing, scope or likelihood of regulatory filings and approvals;
- the anticipated regulatory pathway for our product candidates and planned interactions with regulatory agencies;
- our ability to develop and advance product candidates into, and successfully complete, clinical studies;
- our expectations regarding the size of the patient populations for our product candidates, if approved for commercial use;
- the implementation of our business model and our strategic plans for our business, product candidates, technology and plato platform;
- our commercialization, marketing and manufacturing capabilities and strategy;
- the pricing and reimbursement of our product candidates, if approved;
- the scalability and commercial viability of our manufacturing methods and processes, including our move to a closed, automated system;
- the rate and degree of market acceptance and clinical utility of our product candidates, in particular, and gene therapy, in general;
- our ability to establish or maintain collaborations or strategic relationships or obtain additional funding;
- our competitive position;
- the scope of protection we and/or our licensors are able to establish and maintain for intellectual property rights covering our current and future product candidates, as well as any statements as to whether we do or do not infringe, misappropriate or otherwise violate any third-party intellectual property rights;
- our financial performance;
- our ability to retain the continued service of our key professionals and to identify, hire and retain additional qualified professionals;
- developments and projections relating to our competitors and our industry, including other lentiviral-based gene therapy companies;
- our expectations related to the use of our cash reserves;
- our estimates regarding expenses, future revenue, capital requirements and needs for additional financing;
- our ability to comply with the terms of our term loan agreement;

- our ability to avoid any findings of material weaknesses or significant deficiencies in the future;
- the impact of laws and regulations, including without limitation recently enacted tax reform legislation;
- our expectations regarding the time during which we are an emerging growth company under the Jumpstart Our Business Startups Act of 2012, or JOBS Act; and
- other risks and uncertainties, including those listed under the caption “Risk Factors.”

All of our forward-looking statements are as of the date of this Quarterly Report on Form 10-Q only. In each case, actual results may differ materially from such forward-looking information. We can give no assurance that such expectations or forward-looking statements will prove to be correct. An occurrence of or any material adverse change in one or more of the risk factors or risks and uncertainties referred to in this Quarterly Report on Form 10-Q or included in our other public disclosures or our other periodic reports or other documents or filings filed with or furnished to the Securities and Exchange Commission (the “SEC”) could materially and adversely affect our business, prospects, financial condition and results of operations. Except as required by law, we do not undertake or plan to update or revise any such forward-looking statements to reflect actual results, changes in plans, assumptions, estimates or projections or other circumstances affecting such forward-looking statements occurring after the date of this Quarterly Report on Form 10-Q, even if such results, changes or circumstances make it clear that any forward-looking information will not be realized. Any public statements or disclosures by us following this Quarterly Report on Form 10-Q that modify or impact any of the forward-looking statements contained in this Quarterly Report on Form 10-Q will be deemed to modify or supersede such statements in this Quarterly Report on Form 10-Q.

Note Regarding Trademarks

All brand names or trademarks appearing in this Quarterly Report are the property of their respective holders. Unless the context requires otherwise, references in this Quarterly Report to the “Company,” “we,” “us,” and “our” refer to AVROBIO, Inc.

PART I—FINANCIAL INFORMATION

Item 1. Financial Statements.

CONDENSED CONSOLIDATED BALANCE SHEETS
(unaudited)
(in thousands, except per share data)

	September 30, 2021	December 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	\$ 201,369	\$ 259,682
Prepaid expenses and other current assets	10,289	7,560
Total current assets	211,658	267,242
Property and equipment, net	4,219	3,064
Restricted cash	492	492
Other assets	84	436
Total assets	<u>\$ 216,453</u>	<u>\$ 271,234</u>
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	\$ 2,966	\$ 2,682
Accrued expenses and other current liabilities	19,562	13,693
Deferred rent	266	239
Total current liabilities	22,794	16,614
Deferred rent, net of current portion	90	276
Total liabilities	<u>22,884</u>	<u>16,890</u>
Commitments and contingencies (Note 6)		
Stockholders' equity:		
Preferred stock, \$0.0001 par value; 10,000 shares authorized; no shares issued or outstanding	—	—
Common stock, \$0.0001 par value; 150,000 shares authorized; 43,632 and 41,569 shares issued and outstanding as of September 30, 2021 and December 31, 2020, respectively	4	4
Additional paid-in capital	548,880	518,756
Accumulated deficit	(355,315)	(264,416)
Total stockholders' equity	193,569	254,344
Total liabilities and stockholders' equity	<u>\$ 216,453</u>	<u>\$ 271,234</u>

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

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS
(unaudited)
(in thousands, except per share data)

	<u>Three Months Ended September 30,</u>		<u>Nine Months Ended September 30,</u>	
	<u>2021</u>	<u>2020</u>	<u>2021</u>	<u>2020</u>
Operating expenses:				
Research and development	\$ 23,043	\$ 28,509	\$ 64,114	\$ 67,649
General and administrative	9,577	8,209	26,765	24,515
Total operating expenses	<u>32,620</u>	<u>36,718</u>	<u>90,879</u>	<u>92,164</u>
Loss from operations	<u>(32,620)</u>	<u>(36,718)</u>	<u>(90,879)</u>	<u>(92,164)</u>
Other (expense) income:				
Interest income	2	12	21	706
Other income (expense)	5	(74)	(41)	(123)
Total other (expense) income, net	<u>7</u>	<u>(62)</u>	<u>(20)</u>	<u>583</u>
Net loss	<u>\$ (32,613)</u>	<u>\$ (36,780)</u>	<u>\$ (90,899)</u>	<u>\$ (91,581)</u>
Comprehensive loss	<u>\$ (32,613)</u>	<u>\$ (36,780)</u>	<u>\$ (90,899)</u>	<u>\$ (91,581)</u>
Net loss per share — basic and diluted	<u>\$ (0.75)</u>	<u>\$ (1.01)</u>	<u>\$ (2.13)</u>	<u>\$ (2.59)</u>
Weighted-average number of common shares outstanding — basic and diluted	43,623	36,444	42,588	35,409

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

CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(unaudited)
(in thousands)

Three Months Ended September 30, 2020

	Common Stock		Additional	Paid-in Capital	Accumulated	Deficit	Total
	Shares	Amount					
Balance as of June 30, 2020	36,432	\$ 4	\$ 439,288	\$ (199,505)	\$	239,787	
Stock-based compensation expense	—	—	4,805	—	—	4,805	
Exercise of stock options	7	—	60	—	—	60	
Vesting of restricted stock awards and units	10	—	—	—	—	—	
Net loss	—	—	—	(36,780)	—	(36,780)	
Balance as of September 30, 2020	36,449	\$ 4	\$ 444,153	\$ (236,285)	\$	207,872	

Nine Months Ended September 30, 2020

	Common Stock		Additional	Paid-in Capital	Accumulated	Deficit	Total
	Shares	Amount					
Balance as of December 31, 2019	31,643	\$ 3	\$ 330,714	\$ (144,704)	\$	186,013	
Stock-based compensation expense	—	—	11,526	—	—	11,526	
Exercise of stock options	39	—	156	—	—	156	
Vesting of restricted stock awards and units	31	—	—	—	—	—	
Issuance of common stock upon public offering, net of offering costs of \$419	4,350	1	93,627	—	—	93,628	
Issuance of common stock under ATM facility, net of offering costs of \$67	384	—	8,130	—	—	8,130	
Issuance of common stock under the 2018 employee stock purchase plan	2	—	—	—	—	—	
Net loss	—	—	—	(91,581)	—	(91,581)	
Balance as of September 30, 2020	36,449	\$ 4	\$ 444,153	\$ (236,285)	\$	207,872	

Three Months Ended September 30, 2021

	Common Stock		Additional	Paid-in Capital	Accumulated	Deficit	Total
	Shares	Amount					
Balance as of June 30, 2021	43,623	\$ 4	\$ 543,690	\$ (322,702)	\$	220,992	
Stock-based compensation expense	—	—	5,168	—	—	5,168	
Exercise of stock options	9	—	22	—	—	22	
Net loss	—	—	—	(32,613)	—	(32,613)	
Balance as of September 30, 2021	43,632	\$ 4	\$ 548,880	\$ (355,315)	\$	193,569	

Nine Months Ended September 30, 2021

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount			
Balance as of December 31, 2020	41,569	\$ 4	\$ 518,756	\$ (264,416)	\$ 254,344
Stock-based compensation expense	—	—	14,494	—	14,494
Exercise of stock options	206	—	872	—	872
Issuance of common stock under ATM facility, net of offering costs of \$67	1,829	—	14,550	—	14,550
Issuance of common stock under the 2018 employee stock purchase plan	28	—	208	—	208
Net loss	—	—	—	(90,899)	(90,899)
Balance as of September 30, 2021	43,632	\$ 4	\$ 548,880	\$ (355,315)	\$ 193,569

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

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(unaudited)
(in thousands)

	<u>Nine Months Ended September 30,</u>	
	<u>2021</u>	<u>2020</u>
Cash flows from operating activities:		
Net loss	\$ (90,899)	\$ (91,581)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization expense	963	898
Stock-based compensation expense	14,494	11,526
Deferred rent expense	(159)	(151)
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	(2,729)	(782)
Other assets	352	160
Accounts payable	284	(1,263)
Accrued expenses and other current liabilities	5,566	12,878
Net cash used in operating activities	<u>(72,128)</u>	<u>(68,315)</u>
Cash flows from investing activities:		
Purchases of property and equipment	(1,611)	(1,096)
Net cash used in investing activities	<u>(1,611)</u>	<u>(1,096)</u>
Cash flows from financing activities:		
Proceeds from exercise of stock options	872	156
Proceeds from issuance of common shares upon completion of public offering, net of offering costs	—	93,628
Proceeds from issuance of common shares under ATM facility, net of offering costs paid	14,550	8,130
Payment of offering costs	(204)	—
Proceeds from issuance of ESPP shares	208	—
Net cash provided by financing activities	<u>15,426</u>	<u>101,914</u>
Net (decrease) increase in cash, cash equivalents and restricted cash	(58,313)	32,503
Cash, cash equivalents and restricted cash at beginning of period	260,174	187,535
Cash, cash equivalents and restricted cash at end of period	<u>\$ 201,861</u>	<u>\$ 220,038</u>
Supplemental disclosure of non-cash investing and financing activities:		
Purchases of property and equipment included in accounts payable and accrued expenses	\$ 507	\$ —
Reconciliation of cash, cash equivalents and restricted cash reported within the condensed consolidated balance sheets:		
Cash and cash equivalents, end of period	\$ 201,369	\$ 219,546
Restricted cash	492	492
Cash, cash equivalents and restricted cash, end of period	<u>\$ 201,861</u>	<u>\$ 220,038</u>

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

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except share and per share data)

1. Nature of the Business

AVROBIO, Inc. (the “Company” or “AVROBIO”) is a clinical-stage gene therapy company focused on developing potentially curative *ex vivo* lentiviral gene therapies to treat rare diseases following a single dose treatment regimen.

The Company is subject to risks and uncertainties common to clinical-stage companies in the biotechnology industry, including but not limited to, risks associated with completing preclinical studies and clinical trials, developing and scaling a clinical and commercial supply chain, receiving regulatory approvals for product candidates, development by competitors of new biopharmaceutical products, dependence on key personnel, protection of proprietary technology, compliance with government regulations and the ability to secure additional capital to fund operations. Product candidates currently under development will require significant additional research and development efforts, including preclinical and clinical testing and regulatory approval, prior to commercialization. These efforts require significant amounts of additional capital, adequate personnel and infrastructure and extensive compliance-reporting capabilities. Even if the Company’s product development efforts are successful, it is uncertain when, if ever, the Company will realize revenue from product sales.

The Company has incurred recurring losses since its inception, including net losses of \$90,899 and \$91,581 for the nine months ended September 30, 2021 and 2020, respectively. In addition, as of September 30, 2021, the Company had an accumulated deficit of \$355,315. The Company has primarily funded these losses through the proceeds from sales of common and preferred stock. Although the Company has incurred recurring losses and expects to continue to incur losses for the foreseeable future, the Company expects that its existing cash and cash equivalents on hand as of September 30, 2021 of \$201,369 will be sufficient to fund current planned operations and capital expenditure requirements for at least the next twelve months from the filing date of this Quarterly Report on Form 10-Q with the Securities and Exchange Commission (“SEC”). However, the future viability of the Company is dependent on its ability to raise additional capital to finance its operations. The Company’s inability to raise capital as and when needed could have a negative impact on its financial condition and ability to pursue its business strategies. There can be no assurance that the current operating plan will be achieved or that additional funding will be available on terms acceptable to the Company, or at all.

2. Summary of Significant Accounting Policies***Basis of Presentation***

The accompanying condensed consolidated financial statements (the “unaudited condensed consolidated financial statements”) have been prepared in conformity with accounting principles generally accepted in the United States of America (“GAAP”). Any reference in these notes to applicable guidance is meant to refer to the authoritative United States generally accepted accounting principles as found in the Accounting Standards Codification (“ASC”) and Accounting Standards Update (“ASU”) of the Financial Accounting Standards Board (“FASB”).

The unaudited condensed consolidated financial statements have been prepared on the same basis as the audited annual consolidated financial statements as of and for the year ended December 31, 2020, and, in the opinion of management, reflect all adjustments, consisting of normal recurring adjustments, necessary for the fair presentation of the Company’s financial position as of September 30, 2021, and the results of its operations for the three and nine months ended September 30, 2021 and 2020, its statements of stockholders’ equity for the three and nine months ended September 30, 2021 and 2020 and its statement of cash flows for the nine months ended September 30, 2021 and 2020.

The results for the three and nine months ended September 30, 2021 are not necessarily indicative of the results to be expected for the year ending December 31, 2021, any other interim periods, or any future year or period. These interim financial statements should be read in conjunction with the audited financial statements as of and for the year ended December 31, 2020, and the notes thereto, which are included in the Company’s Annual Report on Form 10-K for the year ended December 31, 2020, filed with the SEC on March 18, 2021.

The unaudited condensed consolidated financial statements reflect the application of certain significant accounting policies as described below and elsewhere in these notes to the unaudited condensed consolidated financial statements. As of September 30, 2021, there have been no changes to the Company’s significant accounting policies as described in the Company’s Annual Report on Form 10-K for the fiscal year ended December 31, 2020.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
(in thousands, except share and per share data)

Segment Information

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker, or decision-making group, in making decisions on how to allocate resources and assess performance. The Company's chief operating decision maker is the chief executive officer ("CEO"). The Company and the CEO view the Company's operations and manage its business as one operating segment. All material long-lived assets of the Company reside in the United States.

Use of Estimates

The preparation of the unaudited condensed consolidated financial statements in conformity with GAAP requires that the Company make estimates and judgments that may affect the reported amounts of assets, liabilities and expenses and the related disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of expenses during the reporting periods. On an ongoing basis, the Company evaluates its estimates, judgments and methodologies. The Company bases its estimates on historical experience and on various other assumptions that are believed to be reasonable, the results of which form the basis for making judgments about the carrying values of assets and liabilities. Actual results may differ from these estimates. Changes in estimates are reflected in reported results in the period in which they become known.

Significant estimates relied upon in preparing the unaudited condensed consolidated financial statements include the determination of the fair value of share-based awards issued and the estimation of accrued research and development expenses.

Stock-based Compensation

For stock-based awards issued to employees and members of the Company's board of directors (the "Board") for their services on the Board, the Company measures the estimated fair value of the stock-based award on the date of grant and recognizes compensation expense for those awards over the requisite service period, which is generally the vesting period of the respective award. The Company issues stock-based awards with only service-based vesting conditions and records the expense for these awards using the straight-line method. The Company has not issued any stock-based awards with performance- or market-based vesting conditions. The Company accounts for forfeitures as they occur.

Prior to the adoption of Accounting Standards Update ("ASU") No. 2018-07, *Compensation-Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting*, the measurement date for non-employee awards was generally the date the services are completed, resulting in financial reporting period adjustments to stock-based compensation during the vesting terms for changes in the fair value of the awards. After adoption of ASU 2018-07, the measurement date for non-employee awards is the later of the adoption date of ASU 2018-07, or the date of grant, without change in the fair value of the award. For stock-based awards granted to nonemployees subject to graded vesting that only contain service conditions, the Company has elected to recognize stock-based compensation expense using the straight-line recognition method.

The Company classifies stock-based compensation expense in its consolidated statements of operations and comprehensive loss in the same manner in which the award recipient's cash compensation costs are classified.

Given the absence of an active market for the Company's common stock prior to its initial public offering ("IPO"), the Company and the Board, the members of which the Company believes have extensive business, finance, and venture capital experience, were required to estimate the fair value of the Company's common stock at the time of each grant of a stock-based award. The Company and the Board determined the estimated fair value of the Company's equity instruments based on a number of factors, including external market conditions affecting the biotechnology industry sector. The Company and the Board utilized various valuation methodologies in accordance with the framework of the American Institute of Certified Public Accountants' Technical Practice Aid, *Valuation of Privately-Held Company Equity Securities Issued as Compensation*, to estimate the fair value of its common stock. Each valuation methodology includes estimates and assumptions that require the Company's judgment. These estimates and assumptions include a number of objective and subjective factors in determining the value of the Company's common stock at each grant date, including: (1) prices paid for the Company's redeemable convertible preferred stock, which the Company had sold to outside investors in arm's-length transactions, and the rights, preferences, and privileges of the Company's redeemable convertible preferred stock and common stock; (2) valuations performed by an independent valuation specialist; (3) the Company's stage of development; (4) the fact that the grants of stock-based awards involved illiquid securities in a private company; and (5) the

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
(in thousands, except share and per share data)

likelihood of achieving a liquidity event for the common stock underlying the stock-based awards, such as an IPO or sale of the Company, given prevailing market conditions.

The fair value of each stock option award is estimated on the date of grant using the Black-Scholes option pricing model. As there was no public market for its common stock prior to June 21, 2018, which was the first day of trading, and as the trading history of the Company's common stock was limited through December 31, 2020, the Company determined the volatility for awards granted up through December 31, 2020 based on an analysis of reported data for a group of guideline companies that issued options with substantially similar terms. Beginning with options granted in 2021, the Company estimates its expected stock volatility using a weighted-average calculation based on the historical volatility of the Company and publicly traded peer companies and expects to continue to do so until such time as it has adequate historical data regarding the volatility of its own traded stock price. The expected term of the Company's stock options has been determined utilizing the "simplified" method for awards that qualify as "plain-vanilla" options. 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. The Company has not paid, and does not anticipate paying, cash dividends on its common stock; therefore, the expected dividend yield is assumed to be zero.

Emerging Growth Company Status

The Company is an "emerging growth company," as defined in the Jumpstart Our Business Startups Act, or JOBS Act, and may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies. The Company may take advantage of these exemptions until the Company is no longer an "emerging growth company." Section 107 of the JOBS Act provides that an "emerging growth company" can take advantage of the extended transition period afforded by the JOBS Act for the implementation of new or revised accounting standards. The Company has elected to use the extended transition period for complying with new or revised accounting standards and as a result of this election, its consolidated financial statements may not be comparable to companies that comply with public company effective dates. The Company may take advantage of these exemptions up until the last day of the fiscal year following the fifth anniversary of its IPO or such earlier time that it is no longer an "emerging growth company."

Subsequent Event Considerations

The Company considers events or transactions that occur after the balance sheet date but prior to the issuance of the consolidated financial statements to provide additional evidence for certain estimates or to identify matters that require additional disclosure. Subsequent events have been evaluated as required.

Recently Issued Accounting Pronouncements

In February 2016, the FASB issued ASU No. 2016-02, *(Topic 842) Leases*, or ASU 2016-02. ASU 2016-02 requires an entity to recognize assets and liabilities arising from a lease for both financing and operating leases. The ASU will also require new qualitative and quantitative disclosures to help investors and other financial statement users better understand the amount, timing, and uncertainty of cash flows arising from leases. For public entities, ASU 2016-02 is effective for fiscal years beginning after December 15, 2018. As a result of the Company having elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act, ASU 2016-02 is effective for the Company for the year ended December 31, 2022, and all interim periods thereafter. Early adoption is permitted. The Company is currently evaluating the impact that the adoption of ASU 2016-02 will have on its consolidated financial statements. Based on this evaluation the Company currently expects that its operating lease commitments will be subject to the new standard and recognized as right-of-use assets and operating lease liabilities upon adoption of this standard, which will increase the Company's total assets and total liabilities.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
(in thousands, except share and per share data)

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*, or ASU 2016-13. ASU 2016-13 requires that credit losses be reported as an allowance using an expected losses model, representing the entity's current estimate of credit losses expected to be incurred. The accounting guidance currently in effect is based on an incurred loss model. For available-for-sale debt securities with unrealized losses, this standard now requires allowances to be recorded instead of reducing the amortized cost of the investment. ASU 2016-13 is effective for non-EGCs for fiscal years beginning December 15, 2019 and interim periods within those fiscal years, and will be effective for the Company for fiscal years beginning after December 15, 2022 and interim periods within those fiscal years, assuming the Company remains an EGC. Early adoption is permitted. The Company is currently evaluating the effects the adoption of ASU 2016-13 may have on its financial statements.

In November 2019, the FASB issued ASU 2019-11, "*Codification Improvements to Topic 326, Financial Instruments – Credit Losses*," or ASU 2019-11. ASU 2019-11 is an accounting pronouncement that amends ASU 2016-13, "*Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*." The amendments update guidance on reporting credit losses for financial assets. These amendments affect loans, debt securities, trade receivables, net investments in leases, off balance sheet credit exposures, reinsurance receivables, and any other financial assets not excluded from the scope that have the contractual right to receive cash. The amendments in both ASU 2016-13 and ASU 2019-11 are effective for annual reporting periods beginning after December 15, 2019, including interim periods within those fiscal years. As a result of the Company having elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act, 2016-13 and ASU 2019-11 are effective for the Company for fiscal years beginning after December 15, 2022, and interim periods within those fiscal years. The Company is currently evaluating ASU 2016-13 and ASU 2019-11 and their impact on its consolidated financial statements and financial statement disclosures.

In December 2019, the FASB issued ASU No. 2019-12, *Simplifying the Accounting for Income Taxes*, or ASU 2019-12. ASU 2019-12 eliminates certain exceptions related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period and the recognition of deferred tax liabilities for outside basis differences. It also clarifies and simplifies other aspects of the accounting for income taxes. ASU 2019-12 is effective for non-EGCs for fiscal years beginning after December 15, 2020 and interim periods within those fiscal years and will be effective for the Company for fiscal years beginning after December 15, 2021 and interim periods beginning after December 15, 2022, assuming the Company remains an EGC. Early adoption is permitted. The Company is currently evaluating the effects the adoption of ASU 2019-12 may have on its financial statements.

3. License Agreements

Agreement with The University of Manchester

On September 30, 2020, the Company entered into an agreement ("MPSII License Agreement") with The University of Manchester, England ("UoM"), whereby UoM granted to the Company an exclusive worldwide license under certain patent and other intellectual property rights, subject to certain retained rights, to develop, commercialize and sell an *ex vivo* lentiviral gene therapy for use in the treatment of Hunter syndrome, or mucopolysaccharidosis type II ("MPSII"). As consideration for the MPSII License Agreement, the Company agreed to pay UoM an upfront, one-time fee of \$8,000, which was recognized as research and development expense during the year ended December 31, 2020.

As part of the agreement, the Company is obligated to make milestone payments of up to an aggregate of \$80,000 upon the achievement of specified development and regulatory milestones, to pay royalties, on a product-by-product and country-by-country basis, of a mid-single digit percentage based on net sales of products licensed under the agreement and to pay a low double digit percentage of any sublicense fees received by the Company. The next anticipated payment milestones under the MPSII License Agreement include \$2,000, which would become due following the date of regulatory approval of the clinical trial application for the investigator-sponsored Phase 1/2 clinical trial sponsored by UoM, and \$4,000, upon the dosing of the first patient in the investigator-sponsored Phase 1/2 clinical trial sponsored by UoM.

Unless terminated earlier, the agreement expires upon the later of 15 years from the effective date or the expiration of the last valid claim of the licensed patents, subject to certain surviving rights and obligations. UoM and the Company can each terminate the agreement in the event of the bankruptcy or insolvency of the other party, or a material breach by the other party and failure to cure such breach within a certain period of time. UoM has the right to terminate the agreement in the event of certain actions relating to challenge or opposition to the licensed intellectual property brought by the Company or its affiliates or sublicensees.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
(in thousands, except share and per share data)

Concurrently with the MPSII License Agreement, the Company entered into a collaborative research funding agreement with UoM (“CRFA”). Under the CRFA, the Company has agreed to fund the budgeted costs of an investigator-sponsored Phase 1/2 clinical trial to be sponsored by UoM in connection with the development activities under the MPSII License Agreement, which are currently expected to equal approximately £9,275 in the aggregate.

For the three months ended September 30, 2021 and 2020, the Company incurred \$1.0 million and \$0, respectively, related to the CRFA. For the nine months ended September 30, 2021 and 2020, the Company incurred \$1.8 million and \$0, respectively, related to the CRFA.

Agreements with University Health Network (“UHN”)

Fabry License Agreement—

On January 27, 2016, the Company entered into an agreement with UHN, pursuant to which UHN granted the Company an option to enter into an exclusive license under the UHN intellectual property related to Fabry disease in accordance with the pre-negotiated licensing terms. On November 4, 2016, the Company exercised its option and entered into a license agreement with UHN, pursuant to which UHN granted the Company an exclusive worldwide license under certain intellectual property rights and a non-exclusive worldwide license under certain know-how, in each case subject to certain retained rights, to develop, commercialize and sell products for use in the treatment of Fabry disease. In addition, for three years following the execution of the agreement, UHN granted the Company an exclusive option to obtain a license under certain improvements to the licensed intellectual property rights as well as an option to negotiate a license under certain other improvements.

Under this agreement, the Company paid an option fee of CAD \$20, an upfront license fee of CAD \$75, plus the annual license maintenance fee for the first year. Thereafter, the Company is also required to pay UHN future annual license maintenance fees until the first sale of a licensed product in certain markets. The Company is also obligated to make future milestone payments in an aggregate amount of up to CAD \$2,450 upon the achievement of specified milestones as well as royalties on a country-by-country basis of a low to mid-single-digit percentage of annual net sales of licensed products and a lower single-digit royalty percentage in certain circumstances. Additionally, the Company has agreed to pay a low double-digit royalty percentage of all sublicensing revenue.

The agreement requires the Company to meet certain performance milestones within specified timeframes. UHN may terminate the agreement if the Company fails to meet these performance milestones despite using commercially reasonable efforts and the Company is unable to reach agreement with UHN on revised timeframes. The Company’s royalty obligation expires on a licensed product-by-licensed product and country-by-country basis upon the latest to occur of the expiration or termination of the last valid claim under the licensed intellectual property rights in such country, the tenth anniversary of the first commercial sale of such licensed product in such country and the expiration of any applicable regulatory exclusivity in such country.

Unless terminated earlier, the agreement expires upon the expiration of the Company’s royalty obligation for all licensed products. UHN can terminate the agreement if the Company fails to make any payments within a specified period after receiving written notice of such failure, or in the event that the Company fails to obtain or maintain insurance. Either the Company or UHN may terminate the license agreement in the event of a material breach by the other party and failure to cure such breach within a certain period of time. The Company can voluntarily terminate the agreement with prior notice to UHN.

For the three months ended September 30, 2021 and 2020, the Company recorded research and development expense related to this agreement with UHN of \$102 and \$65, respectively, which consists of reimbursable funded study trial costs. For the nine months ended September 30, 2021 and 2020, the Company recorded research and development expense related to this agreement with UHN of \$175 and \$174, respectively, which consists of reimbursable funded study trial costs. No milestone or maintenance fees were incurred related to this agreement in the three or nine months ended September 30, 2021 and 2020.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
(in thousands, except share and per share data)

Interleukin 12 License Agreement—

On January 27, 2016, the Company entered into an exclusive license agreement with UHN, pursuant to which UHN granted the Company a license to certain patent rights for the commercial development, manufacture, distribution and use of any products or processes resulting from development of those patent rights related to Interleukin 12. Upon execution of this agreement, the Company paid an upfront license fee of CAD \$264. In addition, as part of the initial consideration for the license, the Company issued to UHN 1,161,665 shares of the Company's common stock and agreed to pay UHN up to \$2,000 upon the closing of an IPO if certain criteria are met. The fair value of the shares issued to UHN of \$480 and the upfront fee was expensed upon the execution of the agreement. Upon the closing of the IPO in 2018, as the criteria were met, the Company paid UHN \$2,000. The Company is also required to pay UHN future annual license maintenance fees of CAD \$50 on each anniversary of the effective date of the license agreement prior to expiration or termination and potential future milestone payments of up to CAD \$19,275 upon the achievement of specified clinical and regulatory milestones. The Company also agreed to pay UHN royalties of a low single-digit percentage of net sales of licensed products sold by the Company. If the Company grants any sublicense rights under the license agreement, the Company has agreed to pay UHN a low double-digit royalty percentage of any sublicense income received by the Company.

The agreement requires the Company to meet certain diligence requirements based upon specified milestones. The agreement expires on the later of the date the last patent rights expire in the last country or ten years from the date of first sale. UHN can terminate the agreement if the Company fails to make any payments within a specified period after receiving written notice of such failure, or in the event that the Company fails to obtain or maintain insurance. The Company can voluntarily terminate the agreement with prior notice to UHN. Either the Company or UHN may terminate the license agreement in the event of a material breach by the other party and failure to cure such breach within a certain period of time.

For the three months ended September 30, 2021 and 2020, the Company did not record research and development expense related to this agreement with UHN. For the nine months ended September 30, 2021 and 2020, the Company recorded research and development expense related to this agreement with UHN of \$39 and \$38, respectively, which consists of license maintenance fees. No milestone fees were incurred related to this agreement in the three and nine months ended September 30, 2021 and 2020.

Agreement with BioMarin Pharmaceutical Inc. ("BioMarin")

On August 31, 2017, the Company entered into a license agreement with BioMarin, pursuant to which BioMarin granted the Company an exclusive worldwide license under certain intellectual property rights owned or controlled by BioMarin to develop, commercialize and sell products for use in the treatment of Pompe disease. The license agreement was amended in February 2018 and again in January 2020 to, among things, provide that BioMarin would supply the Company with certain technology materials. As consideration for this agreement, the Company paid an upfront license fee of \$500 in cash and issued 233,765 shares of Series B Preferred Stock to BioMarin at the time of the Company's Series B Preferred Stock financing in January 2018. The Company has a license agreement with BioMarin, pursuant to which BioMarin granted the Company an exclusive worldwide license under certain intellectual property rights owned or controlled by BioMarin to develop, commercialize and sell products for use in the treatment of Pompe disease. The Company is also obligated to make future milestone payments of up to \$13,000 upon the achievement of certain specified milestones and agreed to pay BioMarin royalties of a low single-digit percentage of net sales of licensed products sold by the Company or its affiliates covered by patent rights in a relevant country.

The Company has recognized no expenses related to the license for the three and nine months ended September 30, 2021 and 2020.

Unless terminated earlier, the agreement expires upon the expiration of the Company's royalty obligation for all licensed products throughout the world. BioMarin and the Company can terminate the agreement in the event of a material breach by the other party and failure to cure such breach within a certain period of time. The Company may terminate the agreement at will upon written notice to BioMarin. BioMarin has the right to terminate the agreement upon the Company's bankruptcy or insolvency, or in the event of any challenge or opposition to the licensed patent rights or related actions brought by the Company or its affiliates or sublicensees, or if the Company, its affiliates or sublicensees knowingly assist a third-party in challenging or otherwise opposing the licensed patent rights, except as required under a court order or subpoena.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
(in thousands, except share and per share data)

Agreement with GenStem Therapeutics, Inc. (“GenStem”)

On October 2, 2017, the Company entered into a license agreement with GenStem, pursuant to which GenStem granted the Company an exclusive worldwide license, subject to certain retained rights, under certain intellectual property rights owned or controlled by GenStem to develop, commercialize and sell products for use in the treatment of cystinosis. Under this agreement, the Company paid an upfront license fee of \$1,000 and is required to make payments upon completion of certain milestones up to an aggregate of \$16,000. The Company also agreed to pay GenStem a tiered mid to high single-digit royalty percentage on annual net sales of licensed products as well as a low double-digit percentage of sublicense income received from certain third-party licensees. The Company’s royalty obligation expires on a licensed product-by-licensed product and country-by-country basis on the eleventh anniversary of the first commercial sale of such licensed product in such country or the expiration of the last valid claim under the licensed patent rights covering such licensed product in such country, whichever is later. Unless terminated earlier, the agreement expires upon the expiration of the Company’s royalty obligation for all licensed products throughout the world. GenStem and the Company can terminate the agreement in the event of a material breach by the other party and failure to cure such breach within a certain period of time. The Company may terminate the agreement at will upon the specified prior written notice to GenStem.

The Company has recognized no expenses related to this agreement for the three and nine months ended September 30, 2021 and 2020.

Agreement with Lund University Rights Holders

On November 17, 2016, the Company entered into a license agreement with affiliates of Lund University, along with certain other relevant rights holders that may be added from time to time, pursuant to which such rights holders granted to the Company an exclusive worldwide license, subject to certain retained rights, under certain intellectual property rights to develop, commercialize and sell products in any and all uses relevant to Gaucher disease. As consideration for the license, the Company is required to make payments in connection with the achievement of certain milestones up to an aggregate of \$550. The agreement expires on the latest of (i) the twentieth anniversary of the end of a certain research project the Company is funding pursuant to an agreement with Lund University, (ii) the expiration of the term of any patent filed on the licensed rights that covers a licensed product, (iii) the expiration of any applicable marketing exclusivity right and (iv) such time that neither the Company nor any sublicensees, partners or contractors are commercializing a licensed product. Either the Company or the rights holders acting together may terminate the license agreement if the other such party commits a material breach and fails to cure such breach within a certain period of time, or if the other party enters into liquidation, becomes insolvent, or enters into composition or statutory reorganization proceedings.

The Company has recognized no expenses related to this agreement for the three and nine months ended September 30, 2021 and 2020.

4. Fair Value Measurement

The following table presents information about the Company’s financial assets measured at fair value on a recurring basis and indicates the level of the fair value hierarchy utilized to determine such fair values as of September 30, 2021 and December 31, 2020:

	Fair Value Measurements as of September 30, 2021			
	Level 1	Level 2	Level 3	Total
Assets:				
Cash equivalents — money market funds	\$ 200,433	\$ —	\$ —	\$ 200,433
	<u>\$ 200,433</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 200,433</u>
	Fair Value Measurements as of December 31, 2020			
	Level 1	Level 2	Level 3	Total
Assets:				
Cash equivalents — money market funds	\$ 44,416	\$ —	\$ —	\$ 44,416
	<u>\$ 44,416</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 44,416</u>

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
(in thousands, except share and per share data)

The fair value of cash equivalents was determined through quoted prices by third-party pricing services.

During the nine months ended September 30, 2021, there were no transfers between levels.

5. Supplemental Balance Sheet Information

Prepaid expenses and other current assets

Prepaid expenses and other current assets consisted of the following:

	September 30, 2021	December 31, 2020
Tax incentive refund	\$ 2,662	\$ 2,558
Prepaid research and development expenses	4,560	3,145
Prepaid insurance	1,839	973
Prepaid compensation benefits	706	609
Other current assets	522	275
	<u>\$ 10,289</u>	<u>\$ 7,560</u>

Property and equipment, net

Property and equipment, net consisted of the following:

	September 30, 2021	December 31, 2020
Laboratory and office equipment	\$ 5,869	\$ 3,965
Leasehold improvements	1,586	1,377
Computer equipment	149	143
	<u>7,604</u>	<u>5,485</u>
Less: Accumulated depreciation and amortization	<u>(3,385)</u>	<u>(2,421)</u>
Property and equipment, net	<u>\$ 4,219</u>	<u>\$ 3,064</u>

Depreciation and amortization expense was \$374 and \$301, respectively, for the three months ended September 30, 2021 and 2020. Depreciation and amortization expense was \$963 and \$898, respectively, for the nine months ended September 30, 2021 and 2020.

Restricted Cash

As of September 30, 2021 and December 31, 2020, the Company had restricted cash of \$492, which consists of cash used to secure letters of credit for the benefit of the landlord in connection with the Company's lease agreements. The cash will be restricted until the termination or modification of the lease arrangement.

Accrued Expenses

Accrued expenses and other current liabilities consisted of the following:

	September 30, 2021	December 31, 2020
Compensation and benefit costs	\$ 6,225	\$ 6,402
Research and development expenses	11,233	5,847
Consulting and professional fees	889	1,096
Other liabilities	1,215	348
	<u>\$ 19,562</u>	<u>\$ 13,693</u>

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
(in thousands, except share and per share data)

6. Commitments and Contingencies

Legal Proceedings

The Company, from time to time, may be party to litigation arising in the ordinary course of business. The Company was not subject to any material legal proceedings during the nine months ended September 30, 2021 and 2020 and to the best of the Company's knowledge, no material legal proceedings are currently pending or threatened.

Other

The Company is also party to various agreements, principally relating to licensed technology, that require future payments relating to milestones not met at September 30, 2021 and December 31, 2020, or royalties on future sales. No milestone or royalty payments under these agreements are expected to be payable in the immediate future, except as disclosed in Note 3 "License Agreements."

The Company enters into standard indemnification agreements in the ordinary course of business. Pursuant to the agreements, the Company agrees to indemnify, hold harmless, and to reimburse the indemnified party for losses suffered or incurred by the indemnified party, generally the Company's business partners, in connection with any U.S. patent or any copyright or other intellectual property infringement claim by any third-party with respect to the Company's products. Further, the Company indemnifies its directors and officers who are, or were, serving at the Company's request in such capacities. The Company's maximum exposure under these arrangements is unknown as of September 30, 2021. The Company does not anticipate recognizing any significant losses relating to these arrangements. The term of these indemnification agreements is generally perpetual any time after execution of the agreement. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is unlimited. The Company has never incurred costs to defend lawsuits or settle claims related to these indemnification agreements.

7. Stockholders' Equity

Common Stock

As of September 30, 2021 and December 31, 2020, the authorized capital stock of the Company included 150,000,000 shares of common stock, \$0.0001 par value and 10,000,000 shares of undesignated preferred stock. As of September 30, 2021 and December 31, 2020, no undesignated preferred stock was outstanding.

As of September 30, 2021, no cash dividends have been declared or paid.

Common Stock Reserved for Future Issuance

As of September 30, 2021 and December 31, 2020, the Company has reserved the following shares of common stock for future issuance:

	September 30, 2021	December 31, 2020
Shares reserved for exercise of outstanding stock options	7,999,382	5,559,545
Shares reserved for vesting of restricted stock units	709,025	1,198
Shares reserved for issuance under the 2018 Stock Option and Grant Plan	2,147,631	3,877,478
Shares reserved for issuance under the 2018 Employee Stock Purchase Plan	1,151,010	762,900
Shares reserved for issuance under the 2019 Inducement Plan	414,280	365,050
Shares reserved for issuance under the 2020 Inducement Plan	1,637,000	1,700,000
Total shares of authorized common stock reserved for future issuance	14,058,328	12,266,171

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
(in thousands, except share and per share data)

8. Stock-based Compensation

Stock Option Valuation

The assumptions that the Company used to determine the grant-date fair value of stock options granted to employees and members of the board of directors were as follows, presented on a weighted-average basis:

	Nine Months Ended September 30,	
	2021	2020
Expected option life (years)	6.07	6.00
Risk-free interest rate	0.76%	0.84%
Expected volatility	81.25%	75.85%
Expected dividend yield	—%	—%

The following table summarizes the Company's stock option activity for the nine months ended September 30, 2021:

	Number of Options	Weighted- Average Exercise Price	Weighted- Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding as of December 31, 2020	5,559,545	\$ 14.97	7.65	\$ 13,511
Granted	3,916,982	\$ 13.25		
Exercised	(205,972)	\$ 4.23		
Cancelled or forfeited	(1,271,173)	\$ 16.44		
Outstanding as of September 30, 2021	<u>7,999,382</u>	<u>\$ 14.20</u>	8.05	<u>\$ 2,634</u>
Exercisable as of September 30, 2021	2,812,685	\$ 13.45	6.17	\$ 2,593

The aggregate intrinsic value of stock options is calculated as the difference between the exercise price of the underlying stock options and the estimated fair value of the Company's common stock for those stock options that had exercise prices lower than the estimated fair value of the Company's common stock.

The aggregate intrinsic value of options exercised during the nine months ended September 30, 2021 and 2020 was \$1,760 and \$595, respectively.

The weighted-average grant-date fair value of the Company's stock options granted during the nine months ended September 30, 2021 and 2020 was \$9.12 and \$12.98, respectively.

Restricted Stock Units

The following table summarizes the Company's restricted common stock units for the nine months ended September 30, 2021:

	Number of Shares	Weighted- Average Grant Date Fair Value
Issued and unvested as of December 31, 2020	1,198	\$ 15.65
Granted	771,600	\$ 9.63
Vested	(431)	\$ 15.65
Forfeited, cancelled or expired	(63,342)	\$ 9.63
Issued and unvested as of September 30, 2021	<u>709,025</u>	<u>\$ 9.64</u>

The total fair value of restricted stock units vested during the nine months ended September 30, 2021 and 2020 was \$7 thousand and \$44 thousand, respectively.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
(in thousands, except share and per share data)

Stock-Based Compensation

Stock-based compensation expense was allocated as follows:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Research and development	\$ 1,965	\$ 2,686	\$ 5,989	\$ 6,095
General and administrative	3,204	2,119	8,505	5,431
Total stock-based compensation expense	\$ 5,169	\$ 4,805	\$ 14,494	\$ 11,526

As of September 30, 2021, total unrecognized compensation cost related to the unvested stock-based awards was \$52,327, which is expected to be recognized over a weighted-average period of 2.91 years.

9. Net Loss Per Share

For purposes of the diluted net loss per share calculation, stock options and unvested restricted stock are considered to be common stock equivalents but have been excluded from the calculation of diluted net loss per share, as their effect would be anti-dilutive for all periods presented. Therefore, the weighted-average number of common shares outstanding used to calculate both basic and diluted net loss per share is the same.

The following potentially dilutive common stock equivalents, presented based on amounts outstanding at each period end, were excluded from the computation of diluted net loss per share for the periods indicated:

	Nine Months Ended September 30,	
	2021	2020
Options to purchase common stock	7,999,382	5,658,890
Restricted stock units	709,025	1,342

10. Related Party Transactions**UHN**

For the three months ended September 30, 2021 and 2020, the Company recognized \$102 and \$65, respectively, of research and development expense related to the license agreements with UHN. For the nine months ended September 30, 2021 and 2020, the Company recognized \$215 and \$212, respectively, of research and development expense related to the license agreements with UHN. Refer to Note 3 "License Agreements" for additional information regarding the UHN license agreements.

Others

For the three months ended September 30, 2021 and 2020, the Company recorded expenses of \$228 and \$355, respectively, related to a sublease to rent lab space, provided by an entity affiliated with a member of the Company's board of directors. For the nine months ended September 30, 2021 and 2020, the Company recorded expenses of \$1,278 and \$1,081, respectively, related to a sublease to rent lab space, provided by an entity affiliated with a member of the Company's board of directors.

11. Subsequent Events

On November 2, 2021 (the "Closing Date"), the Company entered into a term loan facility for up to \$65.0 million (the "Term Loan") with the lenders party thereto and Silicon Valley Bank ("SVB") as administrative agent and collateral agent. The Company expects to use the proceeds from the Term Loan for working capital or to fund its general business purpose.

The Term Loan is governed by a loan and security agreement, dated November 2, 2021 (the "Loan and Security Agreement"). The Term Loan Agreement provides for (i) on the Closing Date, \$30.0 million aggregate principal amount of term loans available through October 31, 2023; (ii) an additional \$10.0 million term loan facility available through October 31, 2023 upon the achievement of certain regulatory milestones prior to the time of draw; (iii) an additional \$10.0 million term loan facility available through October 31, 2023 upon the achievement of certain regulatory and/or clinical milestones prior to the time of draw; and (iv) an

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)
(in thousands, except share and per share data)

additional discretionary \$15.0 million term loan facility available upon the Company's request and approval by SVB and the lenders. The Company drew \$15.0 million in term loans on the Closing Date.

The Term Loan will mature on October 1, 2026. Each advance under the Term Loan accrues interest at a floating rate per annum equal to the greater of (i) 8.10% and (ii) the Prime Rate plus 4.85%. The Term Loan payments are interest only from the Closing Date through November 1, 2024, after which the Company is required to pay equal monthly installments of principal and accrued interest through October 1, 2026. The Term Loans may be prepaid in full through November 2, 2022 with payment of a 1.50% prepayment premium, after which they may be prepaid in full through November 2, 2023 with payment of a 1.00% prepayment premium, after which they may be prepaid in full with no prepayment premium. An additional final payment of 9.00% of the amount of Terms Loans advanced by the lenders will be due upon prepayment or repayment of the Term Loans in full.

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations.

You should read the following discussion and analysis of our financial condition and results of operations together with our consolidated financial statements and the related notes appearing elsewhere in this Quarterly Report on Form 10-Q and our audited consolidated financial statements and related notes for the year ended December 31, 2020 included in our Annual Report on Form 10-K for the year ended December 31, 2020. Some of the information contained in this discussion and analysis or set forth elsewhere in this Quarterly Report, including information with respect to our plans and strategy for our business, includes forward-looking statements that involve risks, uncertainties and assumptions. Factors that might cause future results to differ materially from those projected in the forward-looking statements include, but are not limited to, those set forth in our Annual Report on Form 10-K for the year ended December 31, 2020, as supplemented by our subsequent filings with the SEC.

Overview

We are a leading clinical-stage gene therapy company with a mission to free people from a lifetime of genetic disease. Our company is focused on developing potentially curative *ex vivo* lentiviral-based gene therapies to treat patients with rare diseases following a single dose treatment regimen. Our gene therapies employ hematopoietic stem cells that are harvested from the patient and then modified with a lentiviral vector to insert the equivalent of a functional copy of the gene that is defective in the target disease. We believe that our approach, which is designed to transform stem cells from patients into therapeutic products, has the potential to provide curative benefit for a range of diseases. Our initial focus is on a group of rare genetic diseases referred to as lysosomal disorders, some of which today are primarily managed with enzyme replacement therapies, or ERTs. These lysosomal disorders have well-understood biologies, identified patient populations, established standards of care yet with significant unmet needs, and represent large market opportunities with approximately \$4.8 billion in worldwide net sales in 2020.

Our initial pipeline is comprised of six lentiviral-based gene therapy programs: AVR-RD-01 for the treatment of Fabry disease; AVR-RD-04 for the treatment of cystinosis; AVR-RD-02 for the treatment of Gaucher disease type 1; AVR-RD-06 for the treatment of Gaucher disease type 3; AVR-RD-05 for the treatment of Hunter syndrome; and AVR-RD-03 for the treatment of Pompe disease.

AVR-RD-01 is currently being evaluated for the treatment of Fabry disease in an investigator-sponsored Phase 1 clinical trial and a Company-sponsored Phase 2 clinical trial. Five patients have been dosed in the investigator-sponsored Phase 1 clinical trial of AVR-RD-01, and enrollment is complete. Nine patients have been dosed in our Company-sponsored Phase 2 clinical trial of AVR-RD-01, which we refer to as the FAB-GT clinical trial, and we are actively recruiting additional potential patients for our currently active sites. We recently amended the FAB-GT clinical trial protocol in the United States to include female participants, eliminate the antibody-status exclusion and collect additional CNS and cardiovascular data, and we plan to submit such amendment in other jurisdictions where we have active clinical sites. In September 2021 we received feedback from the Food and Drug Administration, or FDA, on chemistry, manufacturing and controls, or CMC, requirements for our planned registration trial of AVR-RD-01. Additionally, we plan to engage the FDA in the first quarter of 2022 to obtain feedback on our revised clinical trial design. We are currently aiming to initiate a registration trial in mid-2022, subject to implementing certain modifications to our CMC plans and subject to feedback from the FDA on our proposed trial design.

AVR-RD-04 is currently being studied for the treatment of cystinosis by our collaborators at the University of California, San Diego, or UCSD, in a Phase 1/2 investigator-sponsored clinical trial, and three patients have been dosed. Subject to regulatory clearance we are planning to initiate a Company-sponsored clinical trial of AVR-RD-04 in the second half of 2022.

Two patients have been dosed in our Company-sponsored Phase 1/2 clinical trial of AVR-RD-02 for the treatment of Gaucher disease type 1, which we refer to as the Guard1 clinical trial, and we are actively recruiting additional potential patients for our currently active sites.

AVR-RD-06 is our program for the treatment of Gaucher disease type 3, for which we are planning to initiate a potential registration trial in the second half of 2022, subject to regulatory clearance.

AVR-RD-05 is being studied for the treatment of Hunter syndrome by our collaborators at The University of Manchester, and a Phase 1/2 investigator-sponsored clinical trial is expected to commence in the second half of 2022.

Our AVR-RD-03 program for Pompe disease is currently in preclinical development, with IND-enabling proof-of-concept preclinical studies completed, toxicology studies expected to be completed in 2021 and a Company-sponsored clinical trial being planned for 2022, subject to regulatory clearance.

We currently expect to have dosed an aggregate of 20 to 25 patients across our pipeline by the end of 2021.

Since our inception in 2015, we have devoted substantially all of our resources to organizing and staffing our company, business planning, raising capital, acquiring or discovering product candidates and securing related intellectual property rights, conducting discovery, research and development activities for our programs and planning for potential commercialization. To date, we have not generated any product revenue and have financed our operations primarily through the private placement of our securities and through public offerings of our common stock. Through September 30, 2021, we had received gross cash proceeds of \$87.5 million from sales of our preferred stock; gross cash proceeds, before deducting underwriting discounts and commissions and expenses, of \$428.1 million from sales of our common stock through our initial public offering and follow-on offerings; and gross cash proceeds, before deducting commissions and expenses, of \$23.5 million from sales of our common stock through our “at-the-market,” or ATM, facility.

Additionally, we have incurred significant operating losses. 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 current or future product candidates and programs. Our net losses were \$90.9 million and \$91.6 million for the nine months ended September 30, 2021 and 2020, respectively. As of September 30, 2021, we had an accumulated deficit of \$355.3 million. We expect to continue to incur significant expenses for at least the next several years as we advance our current and future product candidates from discovery through preclinical development and clinical trials and seek regulatory approval of our product candidates. We have expanded the number of programs in our pipeline to a total of six investigational gene therapies, three of which are currently in clinical development. As a result, further development of these programs will require us to expend significant resources to advance these candidates. 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. We may also incur expenses in connection with the in-licensing or acquisition of additional product candidates.

We will need substantial additional funding to support our continuing operations and pursue our growth strategy. Until such time as we can generate significant revenue from product sales, if ever, we expect to finance our operations with proceeds from outside sources, with a majority of such proceeds to be derived from sales of equity, including the net proceeds from our follow-on offerings and sales of common stock under our ATM facility, as well as proceeds from our recently announced Loan and Security Agreement, or the Term Loan Agreement, with the lenders party thereto from time to time, or the Lenders, and Silicon Valley Bank, as administrative agent and collateral agent for the Lenders, or the Agent. We may also pursue additional funding from outside sources, including our expansion of, or our entry into, new borrowing arrangements; research and development incentive payments from the Australian government; and our entry into potential future collaboration agreements for one or more of our programs. We may be unable to raise additional funds or enter into such other agreements or arrangements when needed on favorable terms, or at all. If we fail to raise capital or enter into such agreements as, and when, needed, we may have to significantly delay, scale back or discontinue the development and commercialization of one or more of our product candidates or delay our pursuit of potential in-licenses or acquisitions.

Because of the numerous risks and uncertainties associated with product development, we are unable to predict the timing or amount of increased expenses or when or if we will be able to achieve or maintain profitability. Even if we are able to generate product sales, we may not become profitable. If we fail to become profitable or are unable to sustain profitability on a continuing basis, we may be unable to continue our operations at planned levels and be forced to reduce or terminate our operations.

As of September 30, 2021, we had cash and cash equivalents of \$201.4 million. We believe that our existing cash and cash equivalents as of September 30, 2021, together with the \$15.0 million drawn at close from our Term Loan Agreement, will enable us to fund our operating expenses and capital expenditure requirements into the fourth quarter of 2023. We have based this estimate on assumptions that may prove to be wrong, and we could exhaust our available capital resources sooner than we expect. See “—Liquidity and Capital Resources.” To finance our operations beyond that point, we will need to raise additional capital, which cannot be assured.

COVID-19 Update

As the global healthcare community responded to the COVID-19 pandemic, in 2020 many hospitals, including our clinical sites, temporarily paused elective medical procedures, including dosing of new patients in clinical trials of our investigational gene therapies. While dosing of new patients and data collection from enrolled patients has resumed at clinical sites, the extent to which clinical activities continue to be delayed or interrupted will depend on future developments that are highly uncertain and cannot be accurately predicted, including new information that may emerge concerning COVID-19 and variants of the virus that causes the disease, the actions taken to contain it or treat its impact and the economic impact on local, regional, national and international markets. We have continued our work-from-home policy for most employees, excluding our laboratory staff and a limited number of non-laboratory employees. For those employees, we have implemented safety measures designed to comply with applicable federal, state and local guidelines in response to the ongoing COVID-19 pandemic. We may be required to take additional actions that impact our operations as required by applicable laws or regulations, or which we determine to be in the best interests of our employees.

We continue to closely monitor this rapidly evolving situation and the potential impact on our Company. For additional information regarding the impact of the ongoing COVID-19 pandemic on our business, please see the section titled “Risk Factors” in Part II, Section 1.A of this Quarterly Report.

Other Updates

In October 2021, we reported new interim safety data from our FAB-GT clinical trial of AVR-RD-01 for the treatment of Fabry disease and our Guard1 clinical trial of AVR-RD-02 for the treatment of Gaucher disease type 1 at the virtual 28th Annual Congress of the European Society of Gene & Cell Therapy. In addition, we debuted our new approach to safety monitoring involving high-resolution molecular biology follow-up that is designed to enable the collection and monitoring of integration sites for individual cell types and at different stages of cell maturation.

We recently announced the appointment of Essra Ridha, M.D., MRCP, FFPM, as the Company’s new Chief Medical Officer. Dr. Ridha’s employment with us commenced in October 2021.

In October 2021, the FDA granted rare pediatric disease designation (RPDD) for AVR-RD-05 for the treatment of Hunter syndrome. Under this program, if AVR-RD-05 is approved by the FDA then the Company may qualify for a voucher that can be redeemed to receive a priority review of a subsequent marketing application for a different product candidate.

Components of Our Consolidated Results of Operations

Operating Expenses

Research and Development Expenses

Research and development expenses consist primarily of costs incurred in connection with the discovery and development of our product candidates. We expense research and development costs as incurred. These expenses consist of costs incurred in connection with the development of our product candidates, including:

- license maintenance fees and milestone fees incurred in connection with various license agreements;
- expenses incurred under agreements with contract research organizations, or CROs, contract manufacturing organizations, or CMOs, as well as investigative sites and consultants that conduct our clinical trials, preclinical studies and other scientific development services;
- manufacturing scale-up expenses and the cost of acquiring and manufacturing preclinical and clinical trial materials and commercial materials, including manufacturing validation batches;
- costs of purchasing lab supplies and non-capital equipment used in our preclinical activities;
- employee-related expenses, including salaries, related benefits, travel and stock-based compensation expense for employees engaged in research and development functions;
- costs related to compliance with regulatory requirements; and
- allocated facilities costs, depreciation and other expenses, which include rent and utilities.

We recognize external development costs based on an evaluation of the progress to completion of specific tasks using information provided to us by our service providers.

Our direct research and development expenses are tracked on a program-by-program basis for our product candidates and consist primarily of external costs, such as fees paid to outside consultants, CROs, CMOs, and central laboratories in connection with our preclinical development, process development, manufacturing and clinical development activities. Our direct research and development expenses by program also include fees incurred under license agreements. We do not allocate employee costs or facility expenses, including depreciation or other indirect costs, to specific programs because these costs are deployed across multiple programs and, as such, are not separately classified. We use internal resources primarily to oversee the research and discovery as well as for managing our preclinical development, process development, manufacturing and clinical development activities. These employees work across multiple programs and, therefore, we do not track their costs by program.

The table below summarizes our research and development expenses related to our product candidates (in thousands):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Fabry	\$ 3,356	\$ 2,375	\$ 9,143	\$ 8,416
Gaucher	1,409	2,177	5,887	5,775
Pompe	1,705	1,757	2,413	4,499
Cystinosis	2,243	319	3,270	1,208
Hunter	1,520	8,000	1,872	8,000
Other research activities	—	569	116	4,728
Unallocated research and development expenses	12,810	13,312	41,413	35,023
Total research and development expenses	\$ 23,043	\$ 28,509	\$ 64,114	\$ 67,649

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. As a result, we expect that our research and development expenses will increase substantially over the next several years, particularly as we increase personnel costs, including stock-based compensation, contractor costs and facilities costs, as we continue to advance the development of our product candidates. We also expect to incur additional expenses related to milestone and royalty payments payable to third parties with whom we have entered into license agreements to acquire the rights to our product candidates.

The successful development and commercialization of our product candidates is highly uncertain. At this time, we cannot reasonably estimate or know the nature, timing and costs of the efforts that will be necessary to complete the preclinical and clinical development of any of our product candidates or when, if ever, material net cash inflows may commence from any of our product candidates. This uncertainty is due to the numerous risks and uncertainties associated with product development and commercialization, including the uncertainty of:

- the scope, progress, outcome and costs of our preclinical development activities, clinical trials and other research and development activities;
- the impact of the ongoing COVID-19 pandemic on our preclinical development activities, clinical trials and other research and development activities;
- establishing an appropriate safety profile with IND-enabling studies;
- successful patient enrollment in, and the design, initiation and completion of, clinical trials;
- the timing, receipt and terms of any marketing approvals from applicable regulatory authorities;
- establishing and maintaining clinical and commercial manufacturing capabilities or making arrangements with third-party manufacturers;
- development and timely delivery of commercial-grade drug formulations that can be used in our clinical trials and for commercial launch;
- obtaining, maintaining, defending and enforcing patent claims and other intellectual property rights;
- significant and changing government regulation;
- launching commercial sales of our product candidates, if and when approved, whether alone or in collaboration with others; and
- maintaining a continued acceptable safety profile of the product candidates following approval.

We may never succeed in achieving regulatory approval for any of our product candidates. We may obtain unexpected results from our clinical trials. We may elect to discontinue, delay or modify clinical trials of some product candidates or focus on others. Any changes in the outcome of any of these variables with respect to the development of our product candidates in preclinical and clinical development could mean a significant change in the costs and timing associated with the development of these product candidates. For example, if the FDA or another regulatory authority were to delay our planned start of clinical trials or require us to conduct clinical trials or other testing beyond those that we currently expect, or if we experience significant delays in enrollment in any of our planned clinical trials for any reason, including as a result of the ongoing COVID-19 pandemic, we could be required to

expend significant additional financial resources and time on the completion of clinical development of that product candidate. 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.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries, related benefits, travel and stock-based compensation expense for personnel in executive, finance and administrative functions. General and administrative expenses also include professional fees for legal, consulting, accounting and audit services.

We anticipate that our general and administrative expenses will increase in the future as we increase our headcount to support our continued research activities and development of our product candidates. We also anticipate that we will continue to incur increased accounting, audit, legal, regulatory, compliance, director and officer insurance costs as well as investor and public relations expenses associated with being a public company. We anticipate the additional costs for these services will substantially increase our general and administrative expenses. Additionally, if and when we believe a regulatory approval of a product candidate appears likely, we anticipate an increase in payroll and expense as a result of our preparation for commercial operations, especially as it relates to the sales and marketing of our product candidate.

Other (Expense) Income, Net

Other (expense) income, net primarily consists of interest income earned on our cash and cash equivalents and changes in foreign currency.

Consolidated Results of Operations

Comparison of the three months ended September 30, 2021 and 2020

The following table summarizes our consolidated results of operations (in thousands):

	Three Months Ended September 30,		Change
	2021	2020	
Operating expenses:			
Research and development	\$ 23,043	\$ 28,509	\$ (5,466)
General and administrative	9,577	8,209	1,368
Total operating expenses	<u>32,620</u>	<u>36,718</u>	<u>(4,098)</u>
Loss from operations	(32,620)	(36,718)	4,098
Other (expense) income:			
Interest income	2	12	(10)
Other expense	5	(74)	79
Total other (expense) income, net	<u>7</u>	<u>(62)</u>	<u>69</u>
Net loss	<u>\$ (32,613)</u>	<u>\$ (36,780)</u>	<u>\$ 4,167</u>

Research and Development Expenses

Research and development expenses decreased by approximately \$5.5 million to \$23.0 million for the three months ended September 30, 2021, from \$28.5 million for the three months ended September 30, 2020. This decrease was driven by the \$8.0 million upfront license fee paid for the Hunter program during the three months ended September 30, 2020, offset by a \$2.5 million increase in program development activities related to the advancement of our pipeline programs during the three months ended September 30, 2021. The \$2.5 million increase in program development activities included a \$0.4 million increase in personnel-related costs, a \$1.8 million increase in clinical costs, and a \$3.8 million increase in manufacturing costs. These increases were offset by a \$2.9 million decrease in preclinical costs and a \$0.7 million decrease in non-cash stock-based compensation.

General and Administrative Expenses

General and administrative expenses were \$9.6 million for the three months ended September 30, 2021, compared to \$8.2 million for the three months ended September 30, 2020. The increase of \$1.4 million was attributable to an increase of

\$0.8 million in personnel-related costs and a \$1.1 million increase in non-cash stock-based compensation, offset in part by a decrease in other expenses, primarily related to facilities costs, professional fees and legal fees, of \$0.5 million.

Other (Expense) Income, Net

Other (expense), net, was less than \$0.1 million for the three months ended September 30, 2021 and 2020, and primarily consisted of interest income and foreign currency gains recognized during the period.

Comparison of the nine months ended September 30, 2021 and 2020

	Nine Months Ended September 30,		Change
	2021	2020	
Operating expenses:			
Research and development	\$ 64,114	\$ 67,649	\$ (3,535)
General and administrative	26,765	24,515	2,250
Total operating expenses	90,879	92,164	(1,285)
Loss from operations	(90,879)	(92,164)	1,285
Other (expense) income:			
Interest income	21	706	(685)
Other expenses	(41)	(123)	82
Total other (expense) income, net	(20)	583	(603)
Net loss	<u>\$ (90,899)</u>	<u>\$ (91,581)</u>	<u>\$ 682</u>

Research and Development Expenses

Research and development expenses decreased by approximately \$3.5 million to \$64.1 million for the nine months ended September 30, 2021, from \$67.6 million for the nine months ended September 30, 2020. This decrease was driven by the \$8.0 million upfront license fee we paid for our Hunter program during the nine months ended September 30, 2020, offset by a \$4.5 million increase in program development activities related to the advancement of our pipeline programs during the nine months ended September 30, 2021. The \$4.5 million increase in program development activities included a \$6.1 million increase in personnel-related costs, a \$3.7 million increase in clinical costs, and a \$2.5 million increase in manufacturing costs. These increases were partially offset by a \$7.6 million decrease in preclinical costs.

General and Administrative Expenses

General and administrative expenses were \$26.8 million for the nine months ended September 30, 2021, compared to \$24.5 million for the nine months ended September 30, 2020. The increase of \$2.3 million was attributable to an increase of \$1.8 million in personnel-related costs and a \$3.1 million increase in non-cash stock-based compensation, offset in part by a decrease of \$1.3 million in consulting costs and a decrease in other expenses, primarily related to facilities costs, professional fees and legal fees, of \$1.3 million.

Other (Expense) Income, Net

Other (expense), net, was less than \$0.1 million for the nine months ended September 30, 2021, and primarily consisted of foreign currency losses recognized during the period.

Liquidity and Capital Resources

Since our inception, we have not generated any revenue and have incurred significant operating losses and negative cash flows from our operations. We have funded our operations to date primarily with proceeds from the sale of preferred stock and our common stock through our IPO, and we have raised additional capital through subsequent follow-on offerings and our ATM facility. Through September 30, 2021, we had received gross cash proceeds of \$87.5 million from sales of our preferred stock; gross cash proceeds, before deducting underwriting discounts and commissions and expenses, of \$428.1 million from sales of our common stock through our initial public offering and follow-on offerings; and gross cash proceeds, before deducting commissions and expenses, of \$23.5 million from sales of our common stock under our ATM facility.

On July 1, 2019, we filed a shelf registration statement on Form S-3 with the SEC, or the July 2019 Shelf, which covers the offering, issuance and sale by us of up to an aggregate of \$200.0 million of our common stock, preferred stock, debt securities, warrants and/or units. We simultaneously entered into a Sales Agreement with Cowen and Company, LLC, as sales agent, to provide for the offering, issuance and sale by us of up to \$50.0 million of our common stock from time to time in ATM offerings under the July 2019 Shelf. The July 2019 Shelf was declared effective by the SEC on July 10, 2019.

On December 20, 2019, we filed a shelf registration statement on Form S-3 with the SEC, or the December 2019 Shelf, which covers the offering, issuance and sale by us of up to an aggregate of \$250.0 million of our common stock, preferred stock, debt securities, warrants and/or units. The December 2019 Shelf was declared effective by the SEC on January 14, 2020.

In July 2019, we closed an underwritten public offering, or the July 2019 Follow-On Offering, under the July 2019 Shelf of 7,475,000 shares of our common stock at a public offering price of \$18.50 per share, which included 975,000 shares of our common stock resulting from the full exercise of the underwriters' option to purchase additional shares at the public offering price. The net proceeds to us from this offering, after deducting underwriting discounts and commissions and other offering expenses payable by us, were \$129.5 million.

In February 2020, we closed an underwritten public offering, or the February 2020 Follow-On Offering, under the December 2019 Shelf of 4,350,000 shares of our common stock at a public offering price of \$23.00 per share. The net proceeds to us from this offering, after deducting underwriting discounts and commissions and other offering expenses payable by us, were \$93.6 million.

In June 2020, we sold an aggregate of 384,140 shares of common stock under the ATM facility for net proceeds, after deducting commissions and other offering expenses payable by us, of \$8.1 million.

In November 2020, we closed an underwritten public offering, or the November 2020 Follow-On Offering, of 5,000,000 shares of our common stock at a public offering price of \$15.00 per share. The net proceeds to us from the November 2020 Follow-On Offering, after deducting underwriting discounts and commissions and other offering expenses payable by us, were \$70.2 million.

In May 2021, we sold an aggregate of 1,829,268 shares of common stock under the ATM facility for net proceeds, after deducting commissions and other offering expenses payable by us, of \$14.5 million. As of September 30, 2021, approximately \$26.5 million of common stock remained available for future issuance under the ATM facility.

On November 2, 2021, or the Closing Date, we entered into the Term Loan Agreement. The Term Loan Agreement provides for (i) on the Closing Date, \$30.0 million aggregate principal amount of term loans available through October 31, 2023; (ii) an additional \$10.0 million term loan facility available through October 31, 2023 upon the achievement of certain regulatory milestones prior to the time of draw; (iii) an additional \$10.0 million term loan facility available through October 31, 2023 upon the achievement of certain regulatory or clinical milestones prior to the time of draw; and (iv) an additional discretionary \$15.0 million term loan facility available upon our request and approval by the Agent and the Lenders, or, collectively, the Term Loans. We drew \$15.0 million in term loans on the Closing Date. The loan repayment schedule provides for interest only payments until November 1, 2024, followed by consecutive monthly payments of principal and interest. All unpaid principal and accrued and unpaid interest with respect to each term loan is due and payable in full on October 1, 2026.

As of September 30, 2021, we had cash and cash equivalents of \$201.4 million. Cash in excess of immediate requirements is invested primarily with a view to liquidity and capital preservation. We believe that our existing cash and cash equivalents as of September 30, 2021, together with the \$15.0 million drawn at the closing of the Term Loan Agreement, will enable us to fund our operating expenses and capital expenditure requirements into the fourth quarter of 2023.

Cash Flows

The following table summarizes our cash flows for each of the periods presented (in thousands):

	Nine Months Ended September 30,	
	2021	2020
Net cash used in operating activities	\$ (72,128)	\$ (68,315)
Net cash used in investing activities	(1,611)	(1,096)
Net cash provided by financing activities	15,426	101,914
Net (decrease) increase in cash and cash equivalents	<u>\$ (58,313)</u>	<u>\$ 32,503</u>

Operating Activities

During the nine months ended September 30, 2021, operating activities used \$72.1 million of cash, cash equivalents and restricted cash, resulting from our net loss of \$90.9 million offset by cash provided by changes in our operating assets and liabilities of \$3.5 million and non-cash charges of \$15.3 million. The net changes in our operating assets and liabilities were primarily due to an increase in accrued expenses and other liabilities of \$5.6 million, offset by a \$2.7 million increase in prepaids and other current assets. The non-cash charges primarily included \$14.5 million of stock-based compensation expense and \$1.0 million of depreciation and amortization expense.

During the nine months ended September 30, 2020, operating activities used \$68.3 million of cash, cash equivalents and restricted cash, resulting from our net loss of \$91.6 million partially offset by cash provided by changes in our operating assets and liabilities of \$11.0 million and non-cash charges of \$12.3 million. The net changes in our operating assets and liabilities were primarily due to an increase in accrued expenses and other liabilities of \$12.9 million due to ongoing preclinical, manufacturing, and clinical trial efforts, a decrease in other assets of \$0.2 million, offset by a \$0.8 million increase in prepaids and other current assets and a decrease of \$1.3 million in accounts payable. The non-cash charges primarily included \$11.5 million of stock-based compensation expense and \$0.9 million of depreciation and amortization expense.

Investing Activities

Net cash used in investing activities was \$1.6 million for the nine months ended September 30, 2021 compared to \$1.1 million for the nine months ended September 30, 2020. The increase in cash used in investing activities was primarily due to an increase in purchases of property and equipment.

Financing Activities

Net cash provided by financing activities was \$15.4 million for the nine months ended September 30, 2021 compared to \$101.9 million for the nine months ended September 30, 2020. The decrease in cash provided by financing activities was primarily due to the proceeds of \$93.6 million raised from the February Follow-On Offering during the nine months ended September 30, 2020.

Funding Requirements

Notwithstanding the impact of the evolving COVID-19 pandemic on our company and the global economy generally, we expect our expenses to increase substantially in connection with our ongoing activities, particularly as we advance the preclinical activities and clinical trials of our product candidates. Our expenses will also increase as we:

- continue our development of our product candidates, including continuing enrollment in our ongoing clinical trials and initiating additional clinical and preclinical studies for our current and future product candidates;
- encounter delays or interruptions in our preclinical studies, clinical trials, or supply chain as a result of the COVID-19 pandemic;
- seek to identify and develop or in-license or acquire additional product candidates and technologies;
- seek to industrialize our *ex vivo* lentiviral gene therapy approach into a robust, scalable and, if approved, commercially viable process;
- seek marketing approvals for our product candidates that successfully complete clinical trials, if any;
- establish a sales, marketing and distribution infrastructure to commercialize any product candidates for which we may obtain marketing approval;
- hire and retain additional personnel, such as clinical, medical, manufacturing, quality, commercial and scientific personnel;
- expand our infrastructure, office space and facilities to accommodate our growing employee base, including adding equipment and physical infrastructure to support our research and development; and
- continue to incur additional public company-related costs.

We believe that our \$201.4 million of existing cash and cash equivalents as of September 30, 2021, together with the \$15.0 million drawn on the closing of the Term Loan Agreement, will enable us to fund our operating expenses and capital expenditure requirements into the fourth quarter of 2023. We have based these estimates on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we expect. If we receive regulatory approval for any of our product candidates, we

expect to incur significant commercialization expenses related to product manufacturing, sales, marketing and distribution, depending on where we choose to commercialize.

Until such time, if ever, that we can generate product revenue sufficient to achieve profitability, we expect to finance our cash needs through a combination of equity offerings, debt financings, collaboration agreements, government and other third-party funding, strategic alliances, licensing arrangements or marketing and distribution arrangements. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through government and other third-party funding, collaboration agreements, strategic alliances, licensing arrangements or marketing and distribution arrangements, 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 or future commercialization efforts or grant rights to develop and market products or product candidates that we would otherwise prefer to develop and market ourselves.

Contractual Obligations and Commitments

The disclosure of our contractual obligations and commitments is set forth under the heading “Management’s Discussion and Analysis of Financial Condition and Results of Operations—Contractual Obligations and Commitments” in our Annual Report on Form 10-K for the fiscal year ended December 31, 2020, filed with the SEC on March 18, 2021. There have been no significant changes to the table contained therein as of September 30, 2021.

On November 2, 2021, we entered into the Term Loan Agreement for up to \$65.0 million. See “—Liquidity and Capital Resources.”

Critical Accounting Policies and Significant Judgments and Estimates

Our consolidated financial statements are prepared in accordance with generally accepted accounting principles in the United States. The preparation of our consolidated financial statements and related disclosures requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue, costs and expenses, and the disclosure of contingent assets and liabilities in our financial statements. We base our estimates on historical experience, known trends and events and various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. We evaluate our estimates and assumptions on an ongoing basis. Our actual results may differ from these estimates under different assumptions or conditions. During the nine months ended September 30, 2021, there were no material changes to our critical accounting policies. Our critical accounting policies are described under the heading “Management’s Discussion and Analysis of Financial Condition and Results of Operations— Critical Accounting Policies and Significant Judgments and Estimates” in our Annual Report on Form 10-K for the fiscal year ended December 31, 2020, which was filed with the SEC on March 18, 2021, and the notes to the consolidated financial statements included in Item 1, “*Condensed Consolidated Unaudited Financial Statements*,” of this Quarterly Report on Form 10-Q.

Emerging Growth Company Status

We are an “emerging growth company,” as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, and we may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies. We may take advantage of these exemptions until we are no longer an emerging growth company. Section 107 of the JOBS Act provides that an emerging growth company can take advantage of the extended transition period afforded by the JOBS Act for the implementation of new or revised accounting standards. We have elected to use the extended transition period for complying with new or revised accounting standards and, as a result of this election, our financial statements may not be comparable to companies that comply with public company effective dates. We may take advantage of these exemptions up until the last day of the fiscal year following the fifth anniversary of our IPO or such earlier time that we are no longer an emerging growth company. We would cease to be an emerging growth company if we have more than \$1.07 billion in annual revenue, we have more than \$700.0 million in market value of our stock held by non-affiliates (and we have been a public company for at least 12 months and have filed one annual report on Form 10-K) or we issue more than \$1.0 billion of non-convertible debt securities over a three-year period.

Off-Balance Sheet Arrangements

As of September 30, 2021, we did not have any significant off-balance sheet arrangements, as defined in Item 303(a)(4)(ii) of Regulation S-K promulgated under the Exchange Act.

Recently Issued Accounting Pronouncements

A description of recently issued accounting pronouncements that may potentially impact our financial position and results of operations is disclosed in Note 2, “*Summary of Significant Accounting Policies*” to our consolidated financial statements appearing at the beginning of this Quarterly Report on Form 10-Q.

Item 3. Quantitative and Qualitative Disclosures about Market Risk.

Interest Rate Risk

As of September 30, 2021, we had cash and cash equivalents of \$201.4 million, which consisted of primarily money market funds. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates, particularly because our cash equivalents are held in short-term money market funds. Due to short-term duration of our investment portfolio and the low risk profile of our investments, an immediate 100 basis point change in interest rates would not have a material effect on the fair market value of our portfolio.

Foreign Currency Exchange Risk

We are exposed to foreign exchange rate risk. Our headquarters are located in the United States, where the majority of our general and administrative expenses and research and development costs are incurred in U.S. dollars. A portion of our research and development costs are incurred by our subsidiaries in Australia and Canada, whose functional currencies are the U.S. dollar but engage in transactions in Australian dollars and Canadian dollars, respectively. During each of the three months ended September 30, 2021 and 2020, we recognized foreign currency transaction losses of \$5 thousand and \$74 thousand, respectively. During each of the nine months ended September 30, 2021 and 2020, we recognized foreign currency transaction losses of \$41 thousand and \$123 thousand, respectively. These losses primarily related to unrealized and realized foreign currency gains and losses as a result of transactions entered into by our Australian and Canadian subsidiaries in currencies other than the U.S. dollar. These foreign currency transaction gains and losses were recorded in other expense, net in our consolidated statements of operations. We believe that a 10% change in the exchange rate between the U.S. dollar, Australian dollar, Great British Pound, and Canadian dollar would not have a material impact on our financial position or results of operations.

As we continue to grow our business, our results of operations and cash flows will be subject to fluctuations due to changes in foreign currency exchange rates, which could adversely impact our results of operations. To date, we have not entered into any foreign currency hedging contracts to mitigate our exposure to foreign currency exchange risk.

Item 4. Controls and Procedures.**Evaluation of Disclosure Controls and Procedures**

Our management, with the participation of our Chief Executive Officer and our Chief Financial Officer (our principal executive officer and principal financial officer, respectively), evaluated the effectiveness of our disclosure controls and procedures as of September 30, 2021. The term “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC’s rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company’s management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. While we continue to evaluate our disclosure controls and procedures, including new procedures and processes relating to our internal control over financial reporting, based on the evaluation of our disclosure controls and procedures as of September 30, 2021, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective at the reasonable assurance level as of September 30, 2021.

Changes in Internal Control over Financial Reporting

No change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) occurred during the three months ended September 30, 2021 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 1. Legal Proceedings.

From time to time, we may become subject to various legal proceedings and claims that arise in the ordinary course of our business activities. Although the results of litigation and claims cannot be predicted with certainty, as of September 30, 2021, we are not presently subject to any pending or threatened litigation that we believe, if determined adversely to us, would individually or in the aggregate be reasonably expected to have a material adverse effect on our business. Regardless of the outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

Item 1A. Risk Factors.

Investing in our common stock involves a high degree of risk. You should carefully consider the following risks and uncertainties, together with all other information in this Quarterly Report on Form 10-Q, including our consolidated financial statements and related notes and “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” as well as our other filings with the Securities and Exchange Commission, or the SEC, before investing in our common stock. Any of the risk factors we describe below could adversely affect our business, financial condition or results of operations. The market price of our common stock could decline if one or more of these risks or uncertainties were to occur, which may cause you to lose all or part of the money you paid to buy our common stock. Additional risks that are currently unknown to us or that we currently believe to be immaterial may also impair our business. Certain statements below are forward-looking statements. See “Forward-Looking Information” in this Quarterly Report on Form 10-Q.

Risks related to our business, financial position and need for additional capital

We have incurred net losses since inception. We expect to incur net losses for the foreseeable future and may never achieve or maintain profitability.

Since inception, we have incurred net losses. We incurred net losses of \$119.7 million and \$73.0 million for the years ended December 31, 2020 and 2019, respectively, and \$90.9 million for the nine months ended September 30, 2021. We historically financed our operations primarily through private placements of our preferred stock and, more recently, our initial public offering and follow-on public offerings of our common stock, as well as sales of our common stock under our “at-the-market” facility. In addition, in November 2021 we entered into the Term Loan Agreement. We have devoted substantially all of our efforts to research and development, including clinical and preclinical development of our product candidates, as well as assembling our team. We expect that it will be several years, if ever, before we have commercialized any product candidates. We expect to continue to incur significant expenses and increasing operating losses for the foreseeable future. We anticipate that our expenses will increase substantially if, and as, we:

- continue our development of our product candidates, including continuing enrollment in our ongoing clinical trials, particularly if and as we commence and continue clinical-stage activities for our product candidates;
- initiate additional clinical trials and preclinical studies for our current and future product candidates;
- experience delays or interruptions in preclinical studies, clinical trials, or our supply chain due to the ongoing COVID-19 pandemic;
- seek to identify and develop or in-license additional product candidates;
- seek marketing approvals for our product candidates that successfully complete clinical trials, if any;
- establish a sales, marketing and distribution infrastructure to commercialize any product candidates for which we may obtain marketing approval;
- continue our implementation of our plato platform as we seek to industrialize our *ex vivo* lentiviral gene therapy approach into a robust, scalable and, if approved, commercially viable process;
- hire and retain additional personnel, such as clinical, quality control, commercial and scientific personnel;
- expand our office space, infrastructure and facilities to accommodate our growing employee base, including adding equipment and physical infrastructure to support our research and development; and
- continue to incur additional public company-related costs.

To become and remain profitable, we must develop and eventually commercialize product candidates with significant market potential. This will require us to be successful in a range of challenging activities, and our expenses will increase substantially as we

seek to complete preclinical and clinical trials of our product candidates, and manufacture, market and sell these or any future product candidates for which we may obtain marketing approval, if any, and satisfy any post-marketing requirements. We may never succeed in any or all of these activities and, even if we do, we may never generate revenues that are significant or large enough to achieve profitability. 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 decrease the value of our Company and could impair our ability to raise capital, maintain our research and development efforts, expand our business or continue our operations. A decline in the value of our Company also could cause you to lose all or part of your investment.

We have never generated revenue from product sales and do not expect to do so for the next several years, if ever.

Our ability to generate revenue from product sales and achieve profitability depends on our ability, alone or with collaborative partners, to successfully complete the development of, and obtain the regulatory approvals necessary to commercialize, our product candidates. We do not anticipate generating revenues from product sales for the next several years, if ever. Our ability to generate future revenues from product sales depends heavily on our, or our collaborators', success in:

- completing research and preclinical and clinical development of our product candidates and identifying new lentiviral-based gene therapy product candidates;
- seeking and obtaining regulatory and marketing approvals for product candidates for which we complete clinical trials;
- launching and commercializing product candidates for which we obtain regulatory and marketing approval by establishing a sales force, marketing and distribution infrastructure or, alternatively, collaborating with a commercialization partner;
- qualifying for adequate coverage and reimbursement by government and third-party payors for our product candidates;
- establishing and maintaining supply and manufacturing processes and relationships with third parties that can provide adequate, in both amount and quality, products and services to support clinical development and the market demand for our product candidates, if approved;
- obtaining market acceptance of our product candidates, if approved, as a viable treatment option;
- addressing any competing technological and market developments;
- negotiating favorable terms in any collaboration, licensing or other arrangements into which we may enter and performing our obligations under such arrangements; and
- attracting, hiring and retaining qualified personnel.

Even if one or more of the product candidates that we develop is approved for commercial sale, we anticipate incurring significant costs associated with commercializing any approved product candidate. Our expenses could increase beyond expectations if we are required by the FDA or other foreign regulatory authorities to perform clinical and other studies in addition to those that we currently anticipate. Even if we are able to generate revenues from the sale of any approved products, we may not become profitable and may need to obtain additional funding to continue operations.

We will need additional funding, which may not be available on acceptable terms, or at all. Failure to obtain this necessary capital when needed may force us to delay, limit or terminate our product development efforts or other operations.

As of September 30, 2021, we had cash and cash equivalents of \$201.4 million. We believe that our existing cash and cash equivalents as of September 30, 2021, together with the \$15.0 million drawn at the closing of our Term Loan Agreement, will enable us to fund our operating expenses and capital expenditure requirements into the fourth quarter of 2023. This forecast of cash resources is forward-looking information that involves risks and uncertainties, and the actual amount of our expenses could vary materially and adversely as a result of a number of factors. We have based our estimates on assumptions that may prove to be wrong, and our expenses could prove to be significantly higher than we currently anticipate.

We expect our expenses to increase in connection with our ongoing activities, particularly as we continue the research and development of, initiate further clinical trials of and seek marketing approval for, our product candidates and continue to enhance and optimize our vector technology and manufacturing processes. Furthermore, we have expanded the number of programs in our pipeline to a total of six investigational gene therapies, three of which are in clinical development. As a result, further development of these programs will require us to expend significant resources to advance these candidates. In addition, if we obtain marketing approval for any of our product candidates, we expect to incur significant expenses related to product sales, medical affairs, marketing, manufacturing and distribution. Furthermore, we expect to continue to incur additional costs associated with operating as a public 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 reasonable terms, we would be forced to delay, reduce or eliminate certain of our research and development programs. Our future capital requirements will depend on many factors, including:

- the scope, progress, results and costs of drug discovery, laboratory testing, preclinical development and clinical trials for our current and future product candidates, including the extent of any impacts from the COVID-19 pandemic on these activities;
- the costs, timing and outcome of regulatory review of our product candidates;
- the costs of future activities, including product sales, medical affairs, marketing, manufacturing and distribution, for any of our product candidates for which we receive marketing approval;
- the costs associated with our manufacturing process development and evaluation of third-party manufacturers;
- revenue, if any, received from commercial sale of our products, should any of our product candidates receive marketing approval;
- the costs of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending intellectual property-related claims;
- the terms of our current and any future license agreements and collaborations; and
- the extent to which we acquire or in-license other product candidates, technologies and intellectual property.

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 product revenues, if any, will be derived from or based on sales of products that may not be commercially available for many years, if at all. Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. Adequate additional financing may not be available to us on acceptable terms, or at all.

Our Term Loan Agreement contains restrictions that potentially limit our flexibility in operating our business. In addition, we may be required to make a prepayment or repay our outstanding indebtedness earlier than we expect.

On November 2, 2021, we entered into the Term Loan Agreement, which provides for term loans of up to \$65.0 million in the aggregate available in three tranches. The Term Loan Agreement contains various covenants that limit our ability to engage in specified types of transactions. These covenants limit our ability to, among other things:

- incur or assume certain debt;
- merge or consolidate or acquire all or substantially all of the capital stock or property of another entity;
- change the nature of our business;
- change our organizational structure or type;
- license, transfer, or dispose of certain assets;
- grant certain types of liens on our assets;
- make certain investments;
- pay cash dividends; and
- enter into material transactions with affiliates.

A breach of any of these covenants could result in an event of default under the Term Loan Agreement. An event of default will also occur if, among other things, a material adverse change in our business, operations, or condition occurs, which could potentially include a material impairment of the prospect of our repayment of any portion of the amounts we owe under the Term Loan Agreement. In the case of a continuing event of default under the Term Loan Agreement, the lenders could elect to declare all amounts outstanding to be immediately due and payable, proceed against the collateral in which we granted the Lenders a security interest under the Term Loan Agreement, or otherwise exercise the rights of a secured creditor. Amounts outstanding under the Term Loan Agreement are secured by all of our existing and future assets, excluding intellectual property, which is subject to a negative pledge arrangement.

At closing, we drew \$15.0 million of the \$30.0 million available to us as part of the first tranche. The Term Loan Agreement also gives us the ability to access up to an additional \$35.0 million, of which \$20.0 million may be drawn in two additional tranches subject to the achievement of certain regulatory and clinical milestones and of which \$15.0 million may be drawn in an additional tranche with the approval of the Agent and the Lenders. If we are unable to satisfy these or other required conditions, or if the Agent

and Lenders do not consent, as applicable, we would not be able to draw down the remaining tranches of financing and may not be able to obtain alternative financing on commercially reasonable terms or at all, which could adversely impact our business.

We may not have enough available cash to repay or refinance our indebtedness at the time any such repayment is required. In such an event, we may be required to delay, limit, reduce, or terminate our preclinical and clinical product development or grant others rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves. Our business, financial condition, and results of operations could be materially adversely affected as a result.

Raising additional capital may cause dilution to our existing stockholders, restrict our operations or cause us to relinquish valuable rights.

We may seek additional capital through a combination of public and private equity offerings, debt financings, strategic partnerships and alliances and licensing arrangements. To the extent that we raise additional capital through the sale of equity, convertible debt securities or other equity-based derivative securities, your ownership interest will be diluted and the terms may include liquidation or other preferences that adversely affect your rights as a stockholder. Any additional indebtedness we incur would result in increased fixed payment obligations and could involve restrictive covenants, such as limitations on our ability to incur additional debt, limitations on our ability to acquire or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. Furthermore, the issuance of additional securities, whether equity or debt, by us, or the possibility of such issuance, may cause the market price of our common stock to decline and existing stockholders may not agree with our financing plans or the terms of such financings. If we raise additional funds through strategic partnerships and alliances and licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, or our product candidates, or grant licenses on terms unfavorable to us. Adequate additional financing may not be available to us on acceptable terms, or at all.

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

We are a clinical-stage company founded in November 2015. Our operations to date have been limited to corporate organization, recruiting key personnel, business planning, raising capital, acquiring rights to our technology, identifying potential product candidates, undertaking preclinical studies and planning and supporting clinical trials of certain of our product candidates and establishing research and development and manufacturing capabilities. We have not yet demonstrated the ability to complete clinical trials of our product candidates, obtain marketing approvals, manufacture products on a clinical or commercial scale or conduct sales and marketing activities necessary for successful commercialization. Consequently, any predictions you make about our future success or viability may not be as accurate as they could be if we had a longer operating history. In addition, as an early-stage company, we may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown factors.

Risks related to the discovery and development of our product candidates

Business interruptions resulting from the coronavirus disease (COVID-19) pandemic or similar public health crises have caused and may continue to cause a disruption of the development of our product candidates and adversely impact our business.

Public health crises such as pandemics or similar outbreaks could adversely impact our business. The ongoing COVID-19 pandemic has continued to disrupt normal business operations both in and outside of affected areas and has had significant negative impacts on businesses and financial markets worldwide. We continue to monitor our operations and applicable government recommendations and have continued our work-from-home policy for most employees, excluding our laboratory staff and a limited number of non-laboratory employees. Notwithstanding these measures, the evolving COVID-19 pandemic could affect the health and availability of our workforce as well as those of the third parties on which we rely. If members of our management and other key personnel are unable to perform their duties or have limited availability due to COVID-19, we may not be able to execute on our business strategy and/or our operations may be negatively impacted. We may experience limitations in employee resources, including because of sickness of employees or their families or the desire of employees to avoid contact with individuals or large groups of people.

In addition, clinical trial activities, including patient enrollment and data collection, are dependent upon global clinical trial sites which have been and continue to be adversely affected by the ongoing COVID-19 pandemic. For example, as the global healthcare community responded to the fluctuations in COVID-19 cases and hospitalizations, many hospitals, including our clinical sites, temporarily paused elective procedures, which included dosing of new patients with our investigational gene therapies. While dosing of new patients began to resume in the first half of 2021, our ability to continue clinical activities without further delay or interruption will depend on future developments that are highly uncertain and cannot be accurately predicted. Additionally, while ongoing data collection has continued for our patients that have been dosed, certain data collection has been delayed and additional delays could result from COVID-19-related interruptions, particularly as new variants of the virus are identified and continue to spread. We are currently conducting clinical trials for our product candidates in the United States, Canada and Australia, and plan to expand to other geographies that have been affected by COVID-19.

Additional factors from the ongoing COVID-19 pandemic that have delayed and may continue to delay or otherwise adversely affect enrollment in or the progress of the clinical trials of our product candidates, as well as our business generally, include:

- the potential diversion of healthcare resources away from the conduct of clinical trials to focus on pandemic concerns, including the attention of physicians serving as our clinical trial investigators, hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our clinical trials;
- limitations on travel that could interrupt key trial activities, such as clinical trial site initiations and monitoring, domestic and international travel by employees, contractors or patients to clinical trial sites, including any government-imposed travel restrictions or quarantines that may impact the ability or willingness of patients, employees or contractors to travel to our clinical trial sites or secure visas or entry permissions, any of which could delay or adversely impact the conduct or progress of our clinical trials;
- interruption in global shipping affecting the transport of clinical trial materials, such as patient samples, investigational drug product and conditioning drugs and other supplies used in our clinical trials;
- business disruptions caused by workplace, laboratory and office closures and an increased reliance on employees working from home, disruptions to or delays in ongoing laboratory experiments and operations, staffing shortages, travel limitations or mass transit disruptions, any of which could adversely impact our business operations or those of third party service providers, contractors, or suppliers on whom we rely, impair the productivity of our personnel, subject us to additional cybersecurity risks, create data accessibility problems, cause us to become more susceptible to communication disruptions, or delay necessary interactions with local regulators, ethics committees and other important agencies and contractors;
- business disruptions involving our third parties on whom we rely, including CROs and other collaborators for the conduct of our clinical trials or our third party suppliers or manufacturers, which could impact their ability to perform adequately or disrupt our supply chain; and
- changes in hospital or research institution policies or government regulations, which could delay or adversely impact our ability to conduct our clinical trials.

Since the beginning of the COVID-19 pandemic, three vaccines for COVID-19 have received Emergency Use Authorization by the FDA and one of those later received marketing approval. Additional vaccines may be authorized or approved in the future. resultant demand for vaccines and potential for manufacturing facilities and materials to be commandeered under the Defense Production Act of 1950, or equivalent foreign legislation, may make it more difficult to obtain materials or manufacturing slots for the products needed for our clinical trials, which could lead to delays in these trials.

These and other factors arising from the ongoing COVID-19 pandemic could worsen and further adversely impact our ability to conduct clinical trials and our business generally, and could have a material adverse impact on our operations and financial condition and results. The extent to which the ongoing COVID-19 pandemic impacts our operations or those of our third party partners will depend on future developments, which are highly uncertain and cannot be predicted with confidence, including the duration of the pandemic, the efficacy and safety of vaccines, including against emerging variants, the ability of third parties to manufacture and distribute vaccines and the public's willingness to receive such vaccines, and new information that may emerge concerning mutations of the coronavirus that causes COVID-19, among others.

Our lentiviral-based gene therapy product candidates are based on a novel technology, which makes it difficult to predict the time and cost of product candidate development and of subsequently obtaining regulatory approval.

We have concentrated our research and development efforts on our lentiviral-based gene therapy approach, and our future success depends on our successful development of viable gene therapy product candidates. There can be no assurance that we will not experience problems or delays in developing new product candidates and that such problems or delays will not cause unanticipated costs, or that any such development problems can be solved. For example, timely enrollment in our clinical trials is dependent upon global clinical trial sites which have been and may continue to be adversely affected by the ongoing COVID-19 pandemic, especially if a resurgence of cases occurs. In addition, the implementation of our plato platform and upgrades, including our transition to Target Concentration Intervention, or TCI, conditioning using busulfan for our single-agent conditioning regimen, may result in delays or setbacks in our research and development activities, and we may not realize the intended benefits of these efforts. In addition, we may also experience delays in developing a sustainable, reproducible and scalable manufacturing process or transferring that process to commercial partners, which may prevent us from completing our clinical studies or commercializing our products on a timely or profitable basis, if at all. For example, as of the date of this Quarterly Report we have only dosed eight patients using our plato platform, which we plan to utilize for the majority of patients in our ongoing FAB-GT clinical trial for AVR-RD-01 and all patients in the Guard1 clinical trial of AVR-RD-02. Our implementation of the LV2 lentiviral vector or of our cell processing to an industrialized, automated closed system using disposable supplies may not be successful or may experience unforeseen delays, which may cause shortages or delays in the supply of our products available for clinical trials and future commercial sales, if any, or impair our research and development efforts, including those in our ongoing and future clinical trials. In addition, there is no assurance that products using our proprietary LV2 lentiviral vector or manufactured using this automated system will ultimately achieve the same favorable preliminary results observed to date. Furthermore, the FDA generally prefers that clinical trials be double-blinded and potentially include sham controls. Such a trial design could be challenging to implement due to the nature of the treatment regimen of lentiviral gene therapy.

In addition, the clinical trial requirements of the FDA and other foreign regulatory authorities and the criteria these regulators use to determine the safety and efficacy of a product candidate vary substantially according to the type, complexity, novelty and intended use and market of such product candidates. The regulatory approval process for novel product candidates such as ours can be more expensive and take longer than for other, better known or more extensively studied product candidates. To date, only a limited number of gene therapies have received marketing authorization from the FDA or foreign regulatory authorities. It is difficult to determine how long it will take or how much it will cost to obtain regulatory approvals for our product candidates in the United States, Canada, Europe, Japan or other major markets or how long it will take to commercialize our product candidates, if any are approved. Approvals by foreign regulatory authorities may not be indicative of what the FDA may require for approval, and vice versa.

Regulatory requirements governing gene and cell therapy products have changed frequently and may continue to change in the future. The FDA has established the Office of Tissues and Advanced Therapies within its Center for Biologics Evaluation and Research, or CBER, to consolidate the review of gene therapy and related products, and has established the Cellular, Tissue and Gene Therapies Advisory Committee to advise the CBER in its review. Gene therapy clinical trials conducted at institutions that receive funding for recombinant DNA research from the United States National Institutes of Health, or NIH, also are subject to the NIH Guidelines, under which supervision of human gene transfer trials includes evaluation and assessment by an institutional biosafety committee, or IBC, a local institutional committee that reviews and oversees research utilizing recombinant or synthetic nucleic acid molecules at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment, and such review may result in some delay before initiation of a clinical trial. If we were to engage an NIH-funded institution to conduct a clinical trial, that institution's IBC as well as its institutional review board, or IRB, would need to review the proposed clinical trial to assess the safety of the trial. In addition, adverse developments in clinical trials of gene therapy products conducted by others may cause the FDA or other oversight bodies to change the requirements for approval of any of our product candidates. Similarly, foreign regulatory authorities may issue new guidelines concerning the development and marketing authorization for gene therapy medicinal products and require that we comply with these new guidelines.

The FDA, NIH and the European Medicines Agency, or EMA, have each expressed interest in further regulating biotechnology, including gene therapy and genetic testing. For example, the EMA advocates a risk-based approach to the development of a gene therapy product. Agencies at both the federal and state level in the United States, as well as the U.S. congressional committees and other governments or governing agencies, have also expressed interest in further regulating the biotechnology industry. Such action may delay or prevent commercialization of some or all of our product candidates.

These regulatory review committees and advisory groups and any new guidelines they promulgate may lengthen the regulatory review process, require us to perform additional studies, increase our development costs, lead to changes in regulatory positions and interpretations, delay or prevent approval and commercialization of these product candidates or lead to significant post-approval limitations or restrictions. As we advance our product candidates, we will be required to consult with these regulatory and advisory groups, and comply with applicable guidelines. If we fail to do so, we may be required to delay or discontinue development of certain

of our product candidates. These additional processes may result in a review and approval process that is longer than we otherwise would have expected. Delay or failure to obtain, or unexpected costs in obtaining, the regulatory approval necessary to bring a potential product to market could decrease our ability to generate sufficient product revenue, and our business, financial condition, results of operations and prospects would be materially and adversely affected.

The FDA continues to develop its approach to assessing gene and cell therapy products. For example, the agency has released a series of draft and final guidance documents relating to, among other topics, various aspects of gene therapy product development, review, and approval, including aspects relating to clinical and manufacturing issues related to gene therapy products. In January 2020, the FDA released a final guidance with recommendations for long-term follow-up studies of patients following human gene therapy administration due to the increased risk of undesirable and unpredictable outcomes with gene therapies that may present as delayed adverse events. We cannot be certain whether such guidance, or other guidance that the FDA may issue, will be relevant to or have an adverse impact on our gene therapy candidates or the duration or expense of any applicable regulatory development and review processes.

Our product candidates and the process for administering our product candidates may cause undesirable side effects or have other properties that could delay or prevent their regulatory approval, limit their commercial potential or result in significant negative consequences following any potential marketing approval.

During the conduct of clinical trials, patients may experience changes in their health, including illnesses, injuries, discomforts or a fatal outcome. It is possible that as we test our product candidates in larger, longer and more extensive clinical programs, or as use of our product candidates becomes more widespread if they receive regulatory approval, illnesses, injuries, discomforts and other adverse events that were observed in earlier clinical trials, as well as conditions that did not occur or went undetected in previous clinical trials, will be reported by patients. Additionally, any early access to the Company's investigational therapies, such as through expanded or Right to Try access, may lead to discovery of undesirable side effects that could have adverse effects on the development programs for current and future product candidates. Gene therapies are also subject to the potential risk that occurrence of adverse events will be delayed following administration of the gene therapy due to persistent biological activity of the genetic material or other components of the vectors used to carry the genetic material. Many times, side effects are only detectable after investigational products are tested in larger scale, pivotal clinical trials or, in some cases, after they are made available to patients on a commercial scale after approval. FDA guidance advises that patients treated with gene therapies undergo long-term follow-up observation for potential adverse events for as long as 15 years. If additional clinical or long-term follow-up experience indicates that any of our product candidates have side effects or cause serious or life-threatening side effects, the development of the product candidate may fail or be delayed, or, if the product candidate has received regulatory approval, such approval may be revoked or limited.

There have been several significant adverse side effects in gene therapy treatments in the past, including multiple reported cases of leukemia, myelodysplastic syndrome and death seen in other clinical trials. Gene therapy is still a relatively new approach to disease treatment and additional adverse side effects could develop. Possible adverse side effects that may occur with treatment with gene therapy products include an immunologic reaction early after administration that could substantially limit the effectiveness of the treatment or represent safety risks for patients. Another traditional safety concern for gene therapies using viral vectors has been the possibility of insertional oncogenesis by the vectors, leading to malignant transformation of transduced cells. As more patients are dosed with *ex vivo* lentiviral gene therapies and higher VCNs are achieved, it is expected that very rare cases of insertional oncogenesis may occur. In addition, persistent dominant clonal expansion due to vector integration has been observed in third-party *ex vivo* lentiviral gene therapy clinical trials, including one case of thalassemia and three cases of cerebral adrenoleukodystrophy, or C-ALD. Each of the C-ALD patients developed persistent dominant clonal expansions within a year of gene therapy infusion, and two patients were subsequently diagnosed with myelodysplastic syndrome with single lineage dysplasia. While our lentiviral gene therapy approach is designed to avoid immunogenicity against the drug product after administration, there can be no assurance that patients would not create antibodies that may impair treatment. In addition, although we are investigating a plan to potentially implement molecular cytogenetic screening, there can be no assurance that we will successfully implement such screening procedures in a timely manner or at all, or that, if implemented, they will enhance the safety profile of our gene therapy product candidates. If any of our gene therapy product candidates demonstrates adverse side effects at unacceptable rates or degrees of severity, we may decide or be required to halt or delay clinical development of such product candidates.

In addition to side effects caused by our product candidates, the conditioning, administration process or related procedures, which we evaluate from time to time as part of our process improvement and optimization efforts, also can cause adverse side effects. A gene therapy patient is generally administered one or more myeloablative drugs to remove stem cells from the bone marrow to create sufficient space in the bone marrow for the modified gene-corrected stem cells to engraft and produce their progeny. This procedure causes adverse side effects and transiently compromises the patient's immune system, known as neutropenia, and ability to form blood clots, known as thrombocytopenia.

In 2019 we began transitioning, in connection with our Company-sponsored clinical trials, towards a new conditioning regimen for our product candidates utilizing busulfan as the myeloablative conditioning agent instead of the melphalan that we previously used. The use of this conditioning regimen is designed to utilize a precision dosing program, TCI, to achieve a balance between the removal of a sufficient amount of bone marrow cells from a patient against potential risks such as toxicity or graft failure. While we believe that the conditioning regimen could be performed during a limited hospital stay, we cannot guarantee that the conditioning will not require a lengthier hospitalization. Our conditioning regimens may not be successful or may nevertheless result in adverse side effects. For example, in each of our ongoing clinical trials several adverse events, including suppression of neutrophils and platelet counts following the conditioning process, were observed. While such adverse events in connection with conditioning is expected, if in the future any such adverse events caused by the conditioning process or related procedures continue at unacceptable rates or degrees of severity, the FDA or other foreign regulatory authorities could order us to cease development of, or deny approval of, our product candidates for any or all targeted indications. There have been cases of therapy-related myelodysplastic syndrome, a type of blood disorder that is a potential precursor to acute myeloid leukemia, in patients with preexisting cancer where busulfan treatment was posited to be a contributing factor to this secondary malignancy. Although we are investigating a plan to potentially implement molecular cytogenetic screening as an additional risk reduction measure, there can be no guarantees that these procedures will be implemented in a timely manner or would be successful if implemented. Even if we are able to demonstrate that adverse events are not product-related, such occurrences could adversely affect patient recruitment or the ability of enrolled patients to complete the clinical trial, and lead to a decline in our stock price.

Additionally, if any of our product candidates receives marketing approval, the FDA could require us to adopt a Risk Evaluation and Mitigation Strategy, or REMS, to ensure that the benefits outweigh its risks, which may include, among other things, a medication guide outlining the risks of the product for distribution to patients, a communication plan to health care practitioners, and restrictions on how or where the product can be distributed, dispensed or used. Furthermore, if we or others later identify undesirable side effects caused by our product candidates, several potentially significant negative consequences could result, including:

- regulatory authorities may suspend or withdraw approvals of such product candidate;
- regulatory authorities may require additional or boxed warnings on the label;
- we may be required to change the way a product candidate is distributed, dispensed, or administered or conduct additional clinical trials;
- we could be sued and held liable for harm caused to patients; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of our product candidates, lead to a decline in our stock price, and significantly harm our business, prospects, financial condition and results of operations.

Our regulatory approach for AVR-RD-01 for the treatment of Fabry disease recently changed, and there can be no assurance that our new, proposed regulatory pathway will be accepted by regulatory agencies.

On March 11, 2021, approximately three weeks before our End-of-Phase 1 meeting for AVR-RD-01 held on March 31, 2021, the FDA granted full (also referred to as traditional) approval of Fabrazyme® (agalsidase beta) more than 18 years after the ERT received accelerated approval on the basis of a surrogate endpoint: reduction of GL-3 (also referred to as Gb3) inclusions in biopsied PTCs. The conversion to full approval limits the accelerated approval pathways available for new therapies to treat Fabry disease, which must now show clinical benefit over Fabrazyme on a surrogate endpoint. Reduction of GL-3 in PTCs is the only surrogate endpoint that has been accepted as a basis for approval for Fabry ERTs at this time. As a result of the Fabrazyme full approval, together with the FDA's feedback on our original proposed trial design, we intend to pursue full approval for AVR-RD-01 based on the same surrogate endpoint that served as the basis for Fabrazyme's full approval.

In September 2021 we received feedback from the FDA on CMC requirements for our planned registration trial, and we expect to engage with the FDA in the first quarter of 2022 to discuss and obtain feedback on our revised clinical trial design. We are currently aiming to initiate a registration trial in mid-2022, subject to implementing certain modifications to our CMC plans and subject to feedback from the FDA on the proposed trial design. However, our planned regulatory pathway is subject to numerous risks, including the following:

- FDA guidance provides that the acceptability of surrogate endpoints is determined on a case-by-case basis, and a particular surrogate endpoint that may be appropriate for use in a particular drug or biologic clinical development program should not be assumed to be appropriate for use in a different program that is in a different clinical setting. Although we believe the recent full approval of Fabrazyme on the basis of a surrogate endpoint of complete/near complete reduction of GL-3 inclusions in biopsied renal PTCs may potentially support use of this endpoint in a registration trial of AVR-RD-01, we have

not discussed this proposed surrogate endpoint with the FDA and there can be no assurance that the FDA will agree with our approach. Moreover, the FDA could require longer clinical or follow-up study requirements for patients, specify patient inclusion criteria that limits our ability to successfully and timely recruit and enroll patients, or require other study design details that will require additional clinical work or render our earlier clinical data of limited utility in support of an application for marketing authorization.

- Even if we obtain alignment with the FDA on our proposed regulatory pathway, without undertaking the special protocol assessment process to obtain FDA agreement on the details of the trial design, including the measurement methodology, number of trial participants and study duration, there is a risk that the FDA may disagree with the final details of our trial design. In addition, although we would propose to the FDA that the registration trial would enroll a number of patients comparable to other orphan disease gene therapy trials, the FDA could require us to enroll more patients than we expect. We have previously encountered delays in patient enrollment and recruitment, and any similar delays in the future could affect our ability to successfully complete a registration trial.
- The timing of our new proposed regulatory pathway is uncertain. Although we intend to engage with the FDA in the first quarter of 2022 to discuss our proposed trial design, we have not yet requested such meeting and there can be no assurances that the FDA will be available to meet with us in a timely manner, particularly given the agency's workload during the ongoing COVID-19 pandemic. Additionally, we will need to make certain modifications to our CMC plans in response to the feedback we received from the FDA in September 2021, and we expect to discuss these modifications at our planned FDA meeting in the first quarter of 2022. Although we believe that we'll be able to successfully implement any required CMC modifications without material delay on the expected timing of our clinical trial initiation, there can be no assurances that the FDA will agree with our proposed CMC plans or that we will be able to implement such plans in a timely manner. Even if we obtain alignment with the FDA on our proposed trial design and CMC readiness, we will need to submit a registration study protocol before we can commence a clinical trial, the timing of which will depend in part upon our interactions with the FDA. Our planned engagement with the FDA and submission of the protocol could be delayed, and as a result we may not be able to initiate a clinical trial in mid-2022, if at all. Furthermore, although the kidney biopsy endpoint in our FAB-GT trial has a 48-week follow-up period, even if the FDA agrees to a kidney biopsy surrogate endpoint in our proposed registration trial design, the FDA could require the follow-up period to be longer than 48-weeks, which would increase the length of the trial and delay any submission of a BLA.

Clinical testing is expensive, time-consuming and uncertain as to outcome. We cannot guarantee that any clinical studies, including our proposed registration trial of AVR-RD-01, will be conducted as planned or completed on schedule, if at all. Even if we are able to complete a registration trial for AVR-RD-01 and receive marketing approval, such approval may be for indications or patient populations that are not as broad as intended or desired, which could limit the potential commercial viability of the approved product. Any inability to successfully conduct our proposed registration trial of AVR-RD-01 using a kidney biopsy surrogate endpoint or other inability to successfully complete our clinical development of AVR-RD-01 could result in additional costs to us and impair our ability to generate revenues.

We have never completed a pivotal or registration clinical trial, and may be unable to do so for any product candidates we may develop.

We are at an early stage of development for all of our product candidates. As of the date of this Quarterly Report, we have dosed only 19 patients across four ongoing clinical trials. These ongoing clinical trials, as well as potentially additional pivotal clinical trials (also referred to as registration trials), must be completed in order to obtain FDA or other regulatory approval to market these product candidates. We have limited experience in preparing, submitting and prosecuting regulatory filings, and have not previously submitted a biologics license application, or BLA, for any product candidate.

Carrying out later-stage clinical trials is a complicated and lengthy process, and we do not expect that all data from patients participating in the clinical trials will be relevant or meaningful. For example, the primary efficacy endpoint of our Phase 2 clinical trial of AVR-RD-01, which we refer to as the FAB-GT clinical trial, is the change, from baseline to one year post-treatment with AVR-RD-01, in the average number of Gb3 inclusions per PTC, as measured in a patient kidney biopsy. The second patient in the FAB-GT trial has an N215S genotype, which is associated with a late-onset cardiac variant phenotype and lower plasma lyso-Gb3 levels. This patient's cardiac variant phenotype does not typically result in Gb3 accumulation in the kidney and skin, and accordingly we do not expect that data obtained from this patient will have a meaningful impact on certain efficacy endpoints in our FAB-GT clinical trial, including kidney and skin biopsies. Nonetheless, there may be other important insights derived from data collected from this patient in the FAB-GT clinical trial. In addition, although a kidney biopsy was performed on the third patient in the FAB-GT clinical trial, as a result of human error in processing the biopsy sample at the external laboratory vendor, the kidney Gb3 inclusions

could not be evaluated and will not be available. However, we expect to continue collecting other data from the third patient, including measures of kidney function such as estimated glomerular filtration rate and measured glomerular filtration rate.

In addition, across our company-sponsored clinical trials we have dosed only one patient in the United States, and our interactions with the FDA have generally been limited. We cannot be certain how many additional clinical trials of AVR-RD-01, AVR-RD-04, AVR-RD-02 or any other product candidates will be required or how such trials should be designed. In order to commence a clinical trial in the United States, we are required to seek FDA acceptance of an IND for each of our product candidates. We cannot be sure any IND we submit to the FDA, or any similar clinical trial application we submit in other countries, will be accepted. While we have received clearance from the FDA to commence clinical testing in the United States for AVR-RD-01 and AVR-RD-02, and the sponsor of the investigator-led clinical trial for AVR-RD-04 has received the same, there can be no assurance that we will be able to submit and secure similar clearances for any of our other product candidates. We may also be required to conduct additional preclinical testing prior to filing an IND for any of our product candidates, and the results of any such testing may not be positive. Consequently, we may be unable to successfully and efficiently execute and complete necessary clinical trials in a way that leads to a BLA submission and approval of any of our product candidates. We may require more time and incur greater costs than our competitors and may not succeed in obtaining regulatory approvals of product candidates that we develop. Failure to commence or complete, or delays in, our planned clinical trials, could prevent us from or delay us in commercializing any of our product candidates.

The ongoing Phase 1 clinical trial of AVR-RD-01 is an investigator-sponsored trial being conducted by University Health Network, and the ongoing Phase 1/2 clinical trial of AVR-RD-04 is also an investigator-sponsored clinical trial, which is being conducted by our collaborators at the University of California, San Diego. In addition, the planned Phase 1/2 clinical trial of AVR-RD-05 will be an investigator-sponsored trial conducted by our collaborators at The University of Manchester. We do not control the design or administration of investigator-sponsored trials, nor the submission or approval of any IND or foreign equivalent required to conduct these trials, and the investigator-sponsored trials could, depending on the actions of such third parties, jeopardize the validity of the clinical data generated, identify significant concerns with respect to our product candidates that could impact our findings or clinical trials, and adversely affect our ability to obtain marketing approval from the FDA or other applicable regulatory authorities. To the extent the results of this or other investigator-sponsored trials are inconsistent with, or different from, the results of our planned Company-sponsored trials or raise concerns regarding our product candidates, the FDA or a foreign regulatory authority may question the results of the Company-sponsored trial, or subject such results to greater scrutiny than it otherwise would. In these circumstances, the FDA or such foreign regulatory authorities may require us to obtain and submit additional clinical data, which could delay clinical development or marketing approval of our product candidates. In addition, while investigator-sponsored trials could be useful to inform our own clinical development efforts, there is no guarantee that we will be able to use the data from these trials to form the basis for regulatory approval of our product candidates.

Success in preclinical studies or early clinical trials may not be indicative of results obtained in later trials.

Results from preclinical studies or early clinical trials are not necessarily predictive of future clinical trial results and are not necessarily indicative of final results. For example, there can be no assurance that prior results, such as signals of safety, activity or durability of effect, observed from preclinical studies or clinical trials will be replicated or will continue in ongoing or future studies or trials. Furthermore, preliminary results may not be indicative of the final results of a trial after all data have been collected and analyzed. There is a high failure rate for gene therapy and biologic product candidates proceeding through clinical trials. Many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials even after achieving promising results in preclinical testing and earlier-stage clinical trials. Data obtained from preclinical and clinical activities are subject to varying interpretations, which may delay, limit or prevent regulatory approval. In addition, the design of a pivotal clinical trial can determine whether its results will support approval of a product and flaws in the design of a clinical trial may not become apparent until the clinical trial is well advanced. Our Company has limited experience in designing and conducting clinical trials and we may be unable to design and execute a clinical trial to support regulatory approval.

We also may experience regulatory delays or rejections as a result of many factors, including due to changes in regulatory policy or the approval of competitive therapies during the period of our product candidate development. Any of our current or future product candidates may fail to show the desired safety and efficacy in clinical development despite positive results in preclinical studies. Any such failure would cause us to abandon the product candidate.

Additionally, the clinical trials performed to date have been open-label studies and have been conducted at a limited number of clinical sites on a limited number of patients. An “open-label” clinical trial is one where both the patient and investigator know whether the patient is receiving the investigational product candidate or either an existing approved drug or placebo. Most typically, open-label clinical trials test only the investigational product candidate and sometimes may do so at different dose levels. Open-label clinical trials are subject to various limitations that may exaggerate any therapeutic effect as patients in open-label clinical trials are aware when they are receiving treatment. Open-label clinical trials may be subject to a “patient bias” where patients perceive their symptoms to have improved merely due to their awareness of receiving an experimental treatment. Moreover, patients selected for

early clinical studies often include the most severe sufferers and their symptoms may have been bound to improve notwithstanding the new treatment. In addition, open-label clinical trials may be subject to an “investigator bias” where those assessing and reviewing the physiological outcomes of the clinical trials are aware that patients have received treatment and may interpret the information more favorably given this knowledge. Because our clinical trials are ongoing, the data that we report are preliminary and subject to change. As is typical in open-label studies in which interim reports are provided, the safety and efficacy data are regularly reviewed and validated. As a result, certain data may change over time, including reductions or increases in the number of reported safety events, until the database is locked at the end of the study.

We may find it difficult to enroll patients in our clinical trials, which could delay or prevent us from proceeding with clinical trials of our product candidates.

Although we expect to have dosed an aggregate of 20 to 25 patients across all our clinical programs by the end of 2021, there can be no assurance we will achieve that goal. The timing and success of our patient enrollment and clinical trial activities depend on our ability to recruit patients to participate as well as the completion of required follow-up periods. Patients may be unwilling to participate in our gene therapy clinical trials because of negative publicity from adverse events related to the biotechnology or gene therapy fields, competitive clinical trials for similar patient populations, clinical trials in product candidates employing our vectors, the existence of current treatments or for other reasons. In addition, the indications that we are currently targeting and may in the future target are rare diseases, which may limit the pool of patients that may be enrolled in our ongoing or planned clinical trials. The timeline for recruiting patients, conducting studies and obtaining regulatory approval of our product candidates may be delayed, including as a result of the ongoing COVID-19 pandemic, which could result in increased costs, delays in advancing our product candidates, delays in testing the effectiveness of our product candidates or termination of the clinical trials altogether. For example, as a result of the COVID-19 pandemic, patient enrollment and dosing was temporarily paused in our ongoing clinical trials and certain data collection has been delayed. While patient enrollment and dosing activities have begun to resume, there could be additional pauses in the future as a result of the COVID-19 pandemic or other factors.

We may not be able to identify, recruit and enroll a sufficient number of patients, or those with required or desired characteristics, to complete our clinical trials in a timely manner. For example, in 2017, the ongoing investigator-sponsored Phase 1 clinical trial of AVR-RD-01 encountered delays in the enrollment of patients due to delays in identifying patients for enrollment and the evaluation of information from screened potential trial participants. In 2019, we encountered delays in the enrollment of patients in the Company-sponsored Phase 1/2 clinical trial of AVR-RD-02 for Gaucher disease, which we refer to as the Guard1 clinical trial. While a number of patients had been identified for the Guard1 clinical trial, we encountered patient pre-screening failures that impacted the commencement of enrollment. Additionally, as a result of the COVID-19 pandemic, in 2020 we encountered protracted timelines with our Guard1 investigational site startup activities, which also impacted patient enrollment.

Patient enrollment and trial completion is affected by factors including the:

- ability to enroll patients and conduct studies as a result of the ongoing COVID-19 pandemic;
- size of the patient population and process for identifying patients;
- design of the trial protocol;
- eligibility and exclusion criteria;
- perceived risks and benefits of the product candidate under study;
- perceived risks and benefits of gene therapy-based approaches to treatment of diseases, including any required pretreatment conditioning regimens;
- availability of competing therapies and clinical trials;
- severity of the disease under investigation;
- availability of genetic testing for potential patients;
- proximity and availability of clinical trial sites for prospective patients;
- ability to obtain and maintain subject consent;
- risk that enrolled patients will drop out before completion of the trial;
- patient referral practices of physicians; and
- ability to monitor patients adequately during and after treatment.

We have expanded our patient enrollment activities to include patients who reside in a country other than the country where the applicable clinical site is located, and who are required to travel for some or all of the clinical testing and procedures required for patients in the applicable clinical trial. We have encountered and in the future may continue to encounter logistical and regulatory challenges that could delay or prevent any such international patients from successfully enrolling and completing clinical trial procedures, including delays in processing or obtaining patient travel visas or denials of entry at borders, potential travel disruptions, or de-prioritization or unavailability of resources at clinical sites for non-resident international clinical trial participants, any of which could delay our progress and completion of planned clinical trials and which would have an adverse effect on our business. In addition, once these international patients return to their home country they may need to travel back to the country where the applicable clinical site is located. If these patients are unwilling or unable to return to the clinical site for testing and procedures, progress and completion of the clinical trial could be delayed or prevented.

Our current product candidates are being developed to treat rare conditions. We plan to seek initial marketing approvals in the United States, Europe and certain other major markets, including Japan. We may not be able to initiate or continue clinical trials if we cannot enroll a sufficient number of eligible patients to participate in the clinical trials required by FDA or other foreign regulatory authorities. Our ability to successfully initiate, enroll and complete a clinical trial in any foreign country is subject to numerous risks unique to conducting business in foreign countries, including:

- difficulty in establishing or managing relationships with contract research organizations, or CROs, clinical study sites and physicians;
- different standards for the conduct of clinical trials;
- the absence in some countries of established groups with sufficient regulatory expertise for review of gene therapy protocols;
- our inability to locate qualified local consultants, physicians and partners; and
- the potential burden of complying with a variety of foreign laws, medical standards and regulatory requirements, including the regulation of pharmaceutical and biotechnology products and treatment.

If we have difficulty enrolling a sufficient number of patients to conduct our clinical trials as planned, we may need to delay, limit or terminate ongoing or planned clinical trials, any of which would have an adverse effect on our business, financial condition, results of operations and prospects.

We may encounter substantial delays in our clinical trials or we may fail to demonstrate safety and efficacy to the satisfaction of applicable regulatory authorities.

Before obtaining marketing approval from regulatory authorities for the sale of our product candidates, we must conduct extensive clinical studies to demonstrate the safety and efficacy of the product candidates in humans. Clinical testing is expensive, time-consuming and uncertain as to outcome. We cannot guarantee that any clinical studies will be conducted as planned or completed on schedule, if at all. A failure of one or more clinical studies can occur at any stage of testing. Events that may prevent successful or timely completion of clinical development include:

- delays as a result of the ongoing COVID-19 pandemic;
- delays in reaching a consensus with regulatory agencies on study design;
- delays in reaching agreement on acceptable terms with prospective CROs and clinical study sites;
- delays in obtaining required Institutional Review Board, or IRB, approval at each clinical study site;
- delays in recruiting suitable patients to participate in our clinical studies;
- imposition of a clinical hold by regulatory agencies, after an inspection of our clinical study operations or study sites;
- failure by our CROs, other third parties or us to adhere to clinical study requirements;
- failure to perform in accordance with the FDA's good clinical practices, or GCP, or applicable regulatory guidelines in other countries;
- delays in the testing, validation, manufacturing and delivery of our product candidates to the clinical sites;

- delays in having patients complete participation in a study or return for post-treatment follow-up;
- clinical study sites or patients dropping out of a study;
- the occurrence of serious adverse events associated with the product candidate that are viewed to outweigh its potential benefits; or
- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols.

Any inability to successfully complete preclinical and clinical development could result in additional costs to us or impair our ability to generate revenues. In addition, if we make changes to our product candidates, we may need to conduct additional studies to bridge our modified product candidates to earlier versions, which could delay our clinical development plan or marketing approval for our product candidates. For example, for our FAB-GT clinical trial of AVR-RD-01, we have transitioned our lentiviral vectors to an LV2 version in connection with our plato platform implementation. In addition, the transition from LV1 to LV2 has required (and is anticipated to continue to require) submission of relevant data to the applicable regulatory authorities in connection with certain of our regulatory filings, including our INDs and clinical trial applications, to demonstrate analytic comparability between LV1 and LV2. Our IND application for our FAB-GT clinical study of AVR-RD-01 for Fabry disease in the United States, which was cleared by the FDA in April 2019, included data to demonstrate comparability between LV1 and LV2 and a transition to an automated manufacturing platform. In addition, our CTA (including amendments) and IND for our Guard1 clinical study of AVR-RD-02 for Gaucher disease in Canada and the United States, for which Health Canada has issued no objection letters and the FDA has cleared, respectively, included data utilizing LV2 and our automated manufacturing platform. While these applications included data relating to our LV2 lentiviral vector and our automated manufacturing process, which are elements of our plato platform, and allow us to commence clinical trials incorporating such elements, we expect that the FDA, Health Canada or other regulatory authorities will require us to undertake additional actions in connection with our transition to our plato platform, including submission of additional comparability studies in connection with future regulatory filings, which may result in delays, suspension or termination of ongoing or future clinical trials, or our inability to conduct our trials according to the plans or the timelines that we have envisioned. For example, the Phase 1/2 investigator-sponsored clinical study of AVR-RD-04 for cystinosis in the United States, which has been cleared by the FDA, does not include our LV2 lentiviral vector or our automated manufacturing platform. Additionally, the study drug for the planned investigator-sponsored clinical study of AVR-RD-05 for Hunter syndrome will not be manufactured using our plato platform, and neither the automated, closed manufacturing system nor LV2 will be used in connection with this clinical trial. We anticipate that we will be required to submit comparability data in future regulatory filings relating to our transition to LV2 and the automated manufacturing platform. Any such filings may result in delay, suspension or termination of ongoing or future clinical trials pending our submission, and the applicable regulatory agency's review, of such updates. Clinical trial delays could also shorten any periods during which we may have the exclusive right to commercialize our product candidates, if approved, or allow our competitors to bring products to market before we do, which could impair our ability to successfully commercialize our product candidates and may harm our business and results of operations.

If the results of our clinical studies are inconclusive or if there are safety concerns or adverse events associated with our product candidates, we may:

- be delayed in obtaining marketing approval for our product candidates, if at all;
- obtain approval for indications or patient populations that are not as broad as intended or desired;
- obtain approval with labeling or a REMS that includes significant use or distribution restrictions or safety warnings;
- be subject to changes with the way the product is administered;
- be required to perform additional clinical studies to support approval or be subject to additional post-marketing testing requirements;
- have regulatory authorities withdraw their approval of the product or impose restrictions on its distribution in the form of a REMS;
- be subject to the addition of labeling statements, such as warnings or contraindications;
- be sued; or
- experience damage to our reputation.

Any of these events could prevent us from achieving or maintaining market acceptance of our product candidates and impair our ability to commercialize our products.

Even if we complete the necessary preclinical and clinical studies, we cannot predict when or if we will obtain regulatory approval to commercialize a product candidate and the approval may be for a narrower indication than we seek.

We cannot commercialize a product until the appropriate regulatory authorities have reviewed and approved the product candidate. Even if our product candidates demonstrate safety and efficacy in clinical studies, the regulatory agencies may not complete their review processes in a timely manner, or we may not be able to obtain regulatory approval. Additional delays may result if an FDA Advisory Committee or other regulatory authority recommends non-approval or restrictions on approval. In addition, we may experience delays or rejections based upon additional government regulation from future legislation or administrative action, or changes in regulatory agency policy during the period of product development, clinical studies and the review process. Regulatory agencies also may approve a treatment candidate for fewer or more limited indications than requested or may grant approval subject to the performance of post-marketing studies. In addition, regulatory agencies may not approve the labeling claims that are necessary or desirable for the successful commercialization of our product candidates. If we are unable to obtain necessary regulatory approvals, our business, prospects, financial condition and results of operations may suffer.

Only certain of our clinical trials, including the Phase 2 FAB-GT clinical trial of AVR-RD-01 for Fabry disease and the Phase 1/2 Guard1 clinical trial of AVR-RD-02 for Gaucher disease type 1, utilize our commercial-scale plato platform.

While we have submitted and intend to continue to submit comparability studies to the FDA and other regulatory agencies, as needed, with respect to our implementation of our commercial-scale plato platform in these and future clinical trials sponsored by us, there can be no assurance that the FDA or other regulatory agencies will not in the future require us to conduct additional preclinical studies or clinical trials that could result in delays and additional costs in our development or commercialization programs for our product candidates, which could adversely affect our business. We intend to continue implementing our commercial-scale plato platform, including heightened vector efficiency, our closed, automated manufacturing system and utilization of a TCI conditioning regimen with busulfan, in connection with each of our investigational product candidates. We have developed the plato platform to form the backbone of our commercial programs, with the intent of replacing our original academic platform with improved solutions for delivering our gene therapy candidates to patients in multiple disease indications. We believe improvements from our plato platform may lead to better patient outcomes with our gene therapy candidates. In order to implement this transition, we have been and will be required to conduct additional studies to bridge our modified product candidates to earlier versions, which could delay our clinical development plans or marketing approvals, if any. Clinical trial delays could also shorten any periods during which we may have the exclusive right to commercialize our product candidates, if approved, or allow our competitors to bring products to market before we do, which could impair our ability to successfully commercialize our product candidates and may harm our business and results of operations.

We face significant competition in our industry and there can be no assurance that our product candidates, if approved, will achieve acceptance in the market over existing established therapies. In addition, our competitors may develop therapies that are more advanced or effective than ours, which may adversely affect our ability to successfully market or commercialize any of our product candidates.

We operate in a highly competitive segment of the biopharmaceutical market. We face competition from many different sources, including larger pharmaceutical, specialty pharmaceutical and biotechnology companies, as well as from academic institutions, government agencies and private and public research institutions. Our product candidates, if successfully developed and approved, will compete with established therapies, some of which are being marketed by large and international companies. In addition, we expect to compete with new treatments that are under development or may be advanced into the clinic by our competitors. There are a variety of product candidates, including gene therapies, in development for the indications that we are targeting.

We anticipate competing with the largest pharmaceutical companies in the world. For example, Sanofi Genzyme and Shire, acquired by Takeda Pharmaceutical Company Ltd., market the enzyme replacement therapies, or ERTs, that represent the standard of care for Fabry patients. In March 2021, Fabrazyme, marketed by Sanofi Genzyme, received full (also referred to as traditional) approval more than 18 years after the ERT received accelerated approval on the basis of a surrogate endpoint. Amicus has secured regulatory approval in the United States and Europe for Migalastat, its oral chaperone therapy for Fabry disease. In addition, Protalix BioTherapeutics, together with Chiesi Global Rare Diseases, is developing pegunigalsidase alfa, their investigational product candidate for Fabry disease. For Gaucher disease, we expect to compete with existing enzyme replacement therapies marketed by Sanofi Genzyme, Shire, Protalix and Pfizer, as well as oral therapies marketed by Actelion and Sanofi. Sanofi also markets an enzyme replacement therapy for Pompe disease, and Shire markets an enzyme replacement therapy for Hunter syndrome. Cystinosis is currently treated by therapies marketed by Horizon Orphan, Mylan, Chiesi, Recordati and Sigma Tau Pharmaceuticals, and Eloxx Pharmaceuticals has been advancing a new treatment in clinical trials. In addition, we may compete with other gene therapy companies in our industry such as bluebird bio and Spark Therapeutics (which was acquired by Roche in 2019). In particular, a

number of gene therapy companies have announced preclinical or clinical non-viral and adeno-associated viral based gene therapy programs that, if successful in obtaining regulatory approval, could compete with our gene therapies.

Many of our competitors have significantly greater financial, product candidate development, manufacturing and marketing resources than we do. Large pharmaceutical and biotechnology companies have extensive experience in clinical testing and obtaining regulatory approval for their products, and mergers and acquisitions within these industries may result in even more resources being concentrated among a smaller number of larger competitors. Established pharmaceutical companies may also invest heavily to accelerate discovery and development of novel therapeutics or to in-license novel therapeutics that could make the product candidates that we develop obsolete. Competition may increase further as a result of advances in the commercial applicability of technologies and greater availability of capital for investment in these industries. Our business would be materially and adversely affected if competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, have broader market acceptance, are more convenient or are less expensive than any product candidate that we may develop.

Even if we obtain regulatory approval of our product candidates, the availability and price of our competitors' products could limit the demand and the price we are able to charge for our product candidates. We may not be able to implement our business plan if the acceptance of our product candidates is inhibited by price competition or the reluctance of physicians to switch from existing methods of treatment to our product candidates, or if physicians switch to other new drug or biologic products or choose to reserve our product candidates for use in limited circumstances.

While we intend to seek designations for our product candidates with the FDA and comparable foreign regulatory authorities that are intended to confer benefits such as a faster development process or an accelerated regulatory pathway, there can be no assurance that we will successfully obtain such designations. In addition, even if one or more of our product candidates are granted such designations, we may not be able to realize the intended benefits of such designations.

The FDA and comparable foreign regulatory authorities offer certain designations for product candidates that are designed to encourage the research and development of product candidates that are intended to address conditions with significant unmet medical need. These designations may confer benefits such as additional interaction with regulatory authorities, a potentially accelerated regulatory pathway and priority review. However, there can be no assurance that we will successfully obtain such designations for any of our product candidates. In addition, while such designations could expedite the development or approval process, they generally do not change the standards for approval. Even if we obtain such designations for one or more of our product candidates, there can be no assurance that we will realize their intended benefits.

We may seek a Breakthrough Therapy Designation for some of our product candidates. A breakthrough therapy is defined as a therapy that is intended, alone or in combination with one or more other therapies, to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the therapy may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. For therapies that have been designated as breakthrough therapies, interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens. Therapies designated as breakthrough therapies by the FDA are also eligible for accelerated approval. 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. In any event, the receipt of a Breakthrough Therapy Designation for a product candidate may not result in a faster development process, review or approval compared to therapies considered for approval under conventional FDA procedures and does not assure ultimate approval by the FDA. In addition, even if one or more of our product candidates qualify as breakthrough therapies, the FDA may later decide that such product candidates no longer meet the conditions for qualification.

In addition, we may seek Fast Track Designation for some of our product candidates. If a therapy is intended for the treatment of a serious or life-threatening condition and the therapy demonstrates the potential to address unmet medical needs for this condition, the therapy sponsor may apply for Fast Track Designation. The FDA has broad discretion whether or not to grant this designation, so even if we believe a particular product candidate is eligible for this designation, there can be no assurance that the FDA would decide to grant it. Even if we do receive Fast Track Designation, we may not experience a faster development process, review or approval compared to conventional FDA procedures, and receiving a Fast Track Designation does not provide assurance of ultimate FDA approval. In addition, the FDA may withdraw Fast Track Designation if it believes that the designation is no longer supported by data from our clinical development program.

In addition, we may seek a regenerative medicine advanced therapy, or RMAT, designation for some of our product candidates. An RMAT is defined as cell therapies, therapeutic tissue engineering products, human cell and tissue products, and combination products using any such therapies or products. Gene therapies, including genetically modified cells that lead to a durable modification of cells or tissues may meet the definition of a regenerative medicine therapy. The RMAT program is intended to facilitate efficient

development and expedite review of RMATs, which are intended to treat, modify, reverse, or cure a serious or life-threatening disease or condition. A new drug application or a BLA for an RMAT may be eligible for priority review or accelerated approval through (1) surrogate or intermediate endpoints reasonably likely to predict long-term clinical benefit or (2) reliance upon data obtained from a meaningful number of sites. Benefits of such designation also include early interactions with FDA to discuss any potential surrogate or intermediate endpoint to be used to support accelerated approval. A regenerative medicine therapy that is granted accelerated approval and is subject to post-approval requirements may fulfill such requirements through the submission of clinical evidence, clinical studies, patient registries, or other sources of real-world evidence, such as electronic health records; the collection of larger confirmatory data sets; or post-approval monitoring of all patients treated with such therapy prior to its approval. RMAT designation is within the discretion of the FDA. Accordingly, even if we believe one of our product candidates meets the criteria for designation as a regenerative medicine advanced therapy, the FDA may disagree and instead determine not to make such designation. In any event, the receipt of RMAT designation for a product candidate may not result in a faster development process, review or approval compared to drugs considered for approval under conventional FDA procedures and does not assure ultimate approval by the FDA. In addition, even if one or more of our product candidates qualify for RMAT designation, the FDA may later decide that the biological products no longer meet the conditions for qualification.

Outside of the United States, we intend to develop AVR-RD-01 in Japan under the purview of the Japanese Pharmaceutical and Medical Device Agency, or PMDA. Pursuant to Japan's regenerative medicine law, an expedited path to conditional approval may exist for regenerative medicine products that show sufficient safety evidence and signals of efficacy in a Phase 2 clinical trial. However, there can be no assurance that the results of our ongoing Phase 2 FAB-GT clinical trial will demonstrate the safety evidence and efficacy signals required for such conditional approval. In addition, this conditional approval is time-limited, and there must be an agreement as to follow-up collection of information to confirm efficacy and safety, similar to a post-marketing commitment in the United States.

We may be unable to obtain orphan drug designation for our product candidates and, even if we obtain such designation, we may not be able to realize the benefits of such designation, including potential marketing exclusivity of our product candidates, if approved.

Regulatory authorities in some jurisdictions, including the United States and other major markets, may designate drugs intended to treat conditions or diseases affecting relatively small patient populations as orphan drugs. Under the Orphan Drug Act of 1983, the FDA may designate a product candidate as an orphan drug if it is intended to treat a rare disease or condition, which is generally defined as having a patient population of 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. In the European Union, EMA's Committee for Orphan Medicinal Products grants orphan drug designation to promote the development of products that are intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition affecting not more than 5 in 10,000 persons in the European Union. Additionally, orphan designation is granted for products intended for the diagnosis, prevention or treatment of a life-threatening, seriously debilitating or serious and chronic condition and when, without incentives, it is unlikely that sales of the drug in the European Union would be sufficient to justify the necessary investment in developing the drug or biologic product.

In December 2018, October 2019 and March 2020, the FDA granted our requests for orphan drug designation for AVR-RD-01 for the treatment of Fabry disease, AVR-RD-02 for the treatment of Gaucher disease and AVR-RD-04 for the treatment of cystinosis, respectively. In September 2020, October 2020 and March 2021 we announced that the European Commission granted our request for orphan drug designation for AVR-RD-02 for the treatment of Gaucher disease, AVR-RD-01 for the treatment of Fabry disease, and AVR-RD-04 for the treatment of cystinosis, respectively. If we request orphan drug designation (or the foreign equivalent) for any other product candidates, there can be no assurances that the FDA or foreign regulatory authorities will grant any of our product candidates such designation. Additionally, the designation of any of our product candidates as an orphan product does not mean that any regulatory agency will accelerate regulatory review of, or ultimately approve, that product candidate, nor does it limit the ability of any regulatory agency to grant orphan drug designation to product candidates of other companies that treat the same indications as our product candidates prior to our product candidates receiving exclusive marketing approval.

Generally, if a product candidate with an orphan drug designation 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 foreign regulatory authorities from approving another marketing application for a product that constitutes the same drug treating the same indication for that marketing exclusivity period, except in limited circumstances. If another sponsor receives such approval before we do (regardless of our orphan drug designation), we will be precluded from receiving marketing approval for our product for the applicable exclusivity period. The applicable period is seven years in the United States and 10 years in the European Union. The exclusivity period in the European Union can be reduced to nine years if 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

revoked if any regulatory agency determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the product to meet the needs of patients with the rare disease or condition.

Even if we obtain orphan drug exclusivity for a product candidate, that exclusivity may not effectively protect the product candidate from competition because different drugs can be approved for the same condition in the United States. Even after an orphan drug is approved, the FDA may subsequently approve another drug for the same condition if the FDA concludes that the latter drug is not the same drug or is clinically superior in that it is shown to be safer, more effective or makes a major contribution to patient care. In the European Union, marketing authorization may be granted to a similar medicinal product for the same orphan indication if:

- the second applicant can establish in its application that its medicinal product, although similar to the orphan medicinal product already authorized, is safer, more effective or otherwise clinically superior;
- the holder of the marketing authorization for the original orphan medicinal product consents to a second orphan medicinal product application; or
- the holder of the marketing authorization for the original orphan medicinal product cannot supply sufficient quantities of orphan medicinal product.

Even if we obtain regulatory approval for a product candidate, our products will remain subject to regulatory oversight.

Even if we obtain any regulatory approval for our product candidates, they will be subject to ongoing regulatory requirements for manufacturing, labeling, packaging, storage, advertising, promotion, sampling, record-keeping and submission of safety and other post-market information. Any regulatory approvals that we receive for our product candidates also may be subject to a REMS, limitations on the approved indicated uses for which the product may be marketed or to the conditions of approval, or contain requirements for potentially costly post-marketing testing, including Phase 4 clinical trials, and surveillance to monitor the quality, safety and efficacy of the product. For example, the holder of an approved BLA is obligated to monitor and report adverse events and any failure of a product to meet the specifications in the BLA. FDA guidance advises that patients treated with gene therapies undergo long-term follow-up observation for potential adverse events for as long as 15 years. The holder of an approved BLA also must submit new or supplemental applications and obtain FDA approval for certain changes to the approved product, product labeling or manufacturing process. Advertising and promotional materials must comply with FDA rules and are subject to FDA review, in addition to other potentially applicable federal and state laws.

In addition, product manufacturers and their facilities are subject to payment of user fees and continual review and periodic inspections by the FDA and other regulatory authorities for compliance with current good manufacturing practices, or CGMP, requirements and adherence to commitments made in the BLA or foreign marketing application. If we, or a regulatory authority, discover previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured or disagrees with the promotion, marketing or labeling of that product, a regulatory authority may impose restrictions relative to that product, the manufacturing facility or us, including requiring recall or withdrawal of the product from the market or suspension of manufacturing.

If we fail to comply with applicable regulatory requirements following approval of any of our product candidates, a regulatory authority may:

- issue a warning letter asserting that we are in violation of the law;
- seek an injunction or impose administrative, civil or criminal penalties or monetary fines;
- suspend or withdraw regulatory approval;
- suspend any ongoing clinical trials;
- refuse to approve a pending BLA or comparable foreign marketing application (or any supplements thereto) submitted by us or our strategic partners;
- restrict the marketing or manufacturing of the product;
- seize or detain the product or otherwise require the withdrawal of the product from the market;
- refuse to permit the import or export of products; or
- refuse to allow us to enter into supply contracts, including government contracts.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity. The occurrence of any event or penalty described above may inhibit our ability to commercialize our product candidates and adversely affect our business, financial condition, results of operations and prospects.

In addition, the FDA's policies, and those of equivalent foreign regulatory agencies, may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. We 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. 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 lose any marketing approval that we may have obtained and we may not achieve or sustain profitability, which would materially and adversely affect our business, financial condition, results of operations and prospects.

Our focus on developing our current product candidates may not yield any commercially viable products, and our failure to successfully identify and develop additional product candidates could impair our ability to grow.

As part of our growth strategy, we intend to identify, develop and market additional product candidates beyond our existing product candidates. We may spend several years completing our development of any particular current or future product candidates, and failure can occur at any stage. The product candidates to which we allocate our resources may not end up being successful. Because we have limited resources, we may forego or delay pursuit of opportunities with certain programs or product candidates or for indications that later prove to have greater commercial potential than our product candidates. Our spending on current and future research and development programs may not yield any commercially viable product candidates. If we do not accurately evaluate the commercial potential for a particular product candidate, we may relinquish valuable rights to that product candidate through strategic collaborations, licensing or other arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate. If any of these events occur, we may be forced to abandon our development efforts with respect to a particular product candidate or fail to develop a potentially successful product candidate.

Because our internal research capabilities are limited, we may be dependent upon biotechnology companies, academic scientists and other researchers to sell or license product candidates, approved products or the underlying technology to us. The success of this strategy depends partly upon our ability to identify, select, discover and acquire promising product candidates and products.

In addition, certain of our current or future product candidates may not demonstrate in patients any or all of the pharmacological benefits we believe they may possess or compare favorably to existing, approved therapies, such as ERT. We have not yet succeeded and may never succeed in demonstrating efficacy and safety of our product candidates or any future product candidates in clinical trials or in obtaining marketing approval thereafter. Accordingly, our focus on treating these diseases may not result in the development of commercially viable products.

If we are unsuccessful in our development efforts, we may not be able to advance the development of our product candidates, commercialize products, raise capital, expand our business or continue our operations.

Risks related to manufacturing

Gene therapies are novel, complex and difficult to manufacture. We could experience production problems that result in delays in our development or commercialization programs or otherwise adversely affect our business.

The manufacturing process we use to produce our product candidates is complex, novel and has not been validated for commercial use. Several factors could cause production interruptions, including equipment malfunctions, facility contamination, raw material shortages or contamination, natural disasters, disruption in utility services, human error or disruptions in the operations of our suppliers.

Our product candidates require processing steps that are more complex than those required for most chemical pharmaceuticals. Moreover, unlike chemical pharmaceuticals, the physical and chemical properties of a biologic such as ours generally cannot be fully characterized. As a result, assays of the finished product may not be sufficient to ensure that the product will perform in the intended manner. Accordingly, we and our manufacturing suppliers employ multiple steps to control the manufacturing process with the goal of ensuring that the product candidate is made strictly and consistently in compliance with the process. Problems with the manufacturing process, including even minor deviations from the intended process, could result in product defects or manufacturing failures that result in lot failures, product recalls, product liability claims or insufficient inventory. We may encounter problems achieving adequate quantities and quality of clinical-grade materials that meet FDA or other applicable regulatory standards or specifications with consistent and acceptable production yields and costs.

In addition, the FDA and other foreign regulatory authorities may require us to submit samples of any lot of any approved product together with the protocols showing the results of applicable tests at any time. Under some circumstances, the FDA or other foreign regulatory authorities may require that we not distribute a lot until the agency authorizes its release. Even slight deviations in the manufacturing process, including those affecting quality attributes and stability, may result in unacceptable changes in the product that could result in lot failures or product recalls. There is no assurance we will not experience lot failures in the future. Lot failures or product recalls could cause us to delay clinical trials, or, if approved, commercial product launches, which could be costly to us and otherwise harm our business, financial condition, results of operations and prospects.

Risks related to our reliance on third parties

We expect to rely on third parties to conduct some or all aspects of our vector production, product manufacturing, protocol development, research and preclinical and clinical testing, and these third parties may not perform satisfactorily.

We do not expect to independently conduct all aspects of our vector production, product manufacturing, protocol development, research and preclinical and clinical testing. We currently rely, and expect to continue to rely, on third parties with respect to these items. For example, we have moved our cell processing to an automated, closed system with a single third-party supplier.

Any of these third parties may terminate their engagements with us or renegotiate the terms of our agreements at any time. If we need to enter into alternative arrangements, it could delay our product development activities. Our reliance on these third parties for research and development activities will reduce our control over these activities but will not relieve us of our responsibility to ensure compliance with all required regulations and study protocols. For example, for product candidates that we develop and commercialize on our own, we will remain responsible for ensuring that each of our preclinical and clinical studies are conducted in accordance with the study plan, protocols and regulatory requirements.

If our contract counterparties do not successfully carry out their contractual duties, meet expected deadlines or conduct our studies in accordance with regulatory requirements or our stated study plans and protocols, we will not be able to complete, or may be delayed in completing, the preclinical and clinical studies required to support approval of our product candidates or the FDA or other regulatory agencies may refuse to accept our clinical or preclinical data. For example, in 2017, the ongoing investigator-sponsored Phase 1 clinical trial of AVR-RD-01 encountered delays in the enrollment of patients due to delays in identifying patients for enrollment and the evaluation of information from screened potential trial participants. In 2019, we encountered delays in the enrollment of patients in the Company-sponsored Guard1 clinical trial of AVR-RD-02 for Gaucher disease. While a number of interested patients had been identified for the Guard1 clinical trial, we encountered patient pre-screening failures that impacted the commencement of enrollment in these studies. Additionally, as a result of the COVID-19 pandemic, in 2020 we encountered protracted timelines with our investigational site startup activities for our Guard1 clinical trial, which also impacted patient enrollment. In 2020, a kidney biopsy was conducted on the third patient in the FAB-GT clinical trial of AVR-RD-01, but due to human error in processing the biopsy sample at the external laboratory vendor, the kidney Gb3 inclusions could not be evaluated and will not be available. Although our quality assurance personnel have worked closely with the external vendor to identify the cause of the vendor error and to identify additional protocols for implementation by the vendor that are designed to prevent similar errors in the future, there can be no assurances that such protocols will be successfully implemented by the vendor.

Reliance on third-party manufacturers entails risks to which we would not be subject if we manufactured the product candidates ourselves, including:

- the inability to negotiate manufacturing agreements with third parties under commercially reasonable terms;
- reduced control as a result of using third-party manufacturers for all aspects of manufacturing activities;
- termination or nonrenewal of manufacturing agreements with third parties in a manner or at a time that is costly or damaging to us; and
- disruptions to the operations of our third-party manufacturers or suppliers caused by conditions unrelated to our business or operations, including the impact of the ongoing COVID-19 pandemic or the bankruptcy of the manufacturer or supplier.

Any of these events could lead to delays of our preclinical and clinical studies or failure to obtain regulatory approval, or impact our ability to successfully commercialize future products. Some of these events could be the basis for FDA action, including injunction, recall, seizure or total or partial suspension of production.

We are dependent on a limited number of suppliers for some of our components and materials used in our product candidates.

We currently depend on a limited number of suppliers for some of the components necessary for our product candidates. We cannot be sure that these suppliers will remain in business, or that they will not be purchased by one of our competitors or another company that is not interested in continuing to produce these materials for our intended purpose. Our use of a limited number of suppliers of raw materials, components and finished goods exposes us to several risks, including disruptions in supply, price increases, late deliveries and an inability to meet customer demand. There are, in general, relatively few alternative sources of supply for these components. These vendors may be unable or unwilling to meet our future demands for our clinical trials or commercial sale. Establishing additional or replacement suppliers for these components could take a substantial amount of time and it may be difficult to establish replacement suppliers who meet regulatory requirements. Any disruption in supply from any supplier or manufacturing location could lead to supply delays or interruptions which would damage our business, financial condition, results of operations and prospects.

If we are required to switch to a replacement supplier or manufacture materials ourselves, the manufacture and delivery of our product candidates could be interrupted for an extended period, adversely affecting our business. Establishing additional or replacement suppliers may not be accomplished quickly, and we may not be able to enter agreements with replacement suppliers on reasonable terms, if at all. In either scenario, our clinical trials supply could be delayed significantly as we establish alternative supply sources. In some cases, the technical skills required to manufacture our products or product candidates may be unique or proprietary to the original CMO and we may have difficulty, or there may be contractual restrictions prohibiting us from, transferring such skills to a back-up or alternate supplier, or we may be unable to transfer such skills at all. If we are able to find a replacement supplier, the replacement supplier would need to be qualified and may require additional regulatory authority approval, which could result in further delay. For example, the FDA could require additional supplemental bridging data if we rely upon a new supplier. We may be unsuccessful in demonstrating the comparability of clinical supplies which could require the conduct of additional clinical trials. While we seek to maintain adequate inventory of the components and materials used in our product candidates, any interruption or delay in the supply of components or materials, or our inability to obtain components or materials from alternate sources at acceptable prices in a timely manner, could impair our ability to conduct our clinical trials and, if our product candidates are approved, to meet the demand of our customers and cause them to cancel orders.

In addition, as part of the FDA's approval of our product candidates, the FDA must review and approve the individual components of our production process, which includes the manufacturing processes and facilities of our suppliers. Our current suppliers have not undergone this process, nor have they had any components included in any product approved by the FDA.

Our reliance on these suppliers subjects us to a number of risks that could harm our reputation, business, and financial condition, including, among other things:

- delays in production, supply, shipment or delivery as a result of the ongoing COVID-19 pandemic;
- the interruption of supply resulting from modifications to or discontinuation of a supplier's operations;
- delays in product shipments resulting from uncorrected defects, reliability issues, or a supplier's variation in a component;
- a lack of long-term supply arrangements for key components with our suppliers;
- the inability to obtain adequate supply in a timely manner, or to obtain adequate supply on commercially reasonable terms;
- difficulty and cost associated with locating and qualifying alternative suppliers for our components in a timely manner;
- production delays related to the evaluation and testing of products from alternative suppliers, and corresponding regulatory qualifications;
- a delay in delivery due to our suppliers prioritizing other customer orders over ours;
- damage to our reputation caused by defective components produced by our suppliers;
- increased cost of our warranty program due to product repair or replacement based upon defects in components produced by our suppliers; and
- fluctuation in delivery by our suppliers due to changes in demand from us or their other customers.

If any of these risks materialize, costs could significantly increase and our ability to conduct our clinical trials and, if our product candidates are approved, to meet demand for our products could be impacted.

We and our contract manufacturers are subject to significant regulation with respect to manufacturing our products. The manufacturing facilities on which we rely may not continue to meet regulatory requirements and have limited capacity.

We currently have relationships with a limited number of suppliers for the manufacturing of our viral vectors and product candidates. Each supplier may require licenses to manufacture such components if such processes are not owned by the supplier or in the public domain and we may be unable to transfer or sublicense the intellectual property rights we may have with respect to such activities.

All entities involved in the preparation of therapeutics for clinical studies or commercial sale, including our existing contract manufacturers for our product candidates, are subject to extensive regulation. Components of a finished therapeutic product approved for commercial sale or used in clinical studies must be manufactured in accordance with CGMP. These regulations govern manufacturing processes and procedures (including record keeping) and the implementation and operation of quality systems to control and assure the quality of investigational products and products approved for sale. Poor control of production processes can lead to the introduction of adventitious agents or other contaminants, or to inadvertent changes in the properties or stability of our product candidates that may not be detectable in final product testing. We or our contract manufacturers must supply all necessary documentation in support of a BLA on a timely basis and must adhere to the FDA's good laboratory practices, or GLP, and CGMP regulations enforced by the FDA through its facilities inspection program. Some of our contract manufacturers have not produced a commercially-approved product and have never been inspected by the FDA before. Our facilities and quality systems and the facilities and quality systems of some or all of our third-party contractors must pass a pre-approval inspection for compliance with the applicable regulations as a condition of regulatory approval of our product candidates or any of our other potential products. In addition, the regulatory authorities may, at any time, audit or inspect a manufacturing facility involved with the preparation of our product candidates or our other potential products or the associated quality systems for compliance with the regulations applicable to the activities being conducted. If these facilities do not pass a pre-approval plant inspection, or if the FDA is unable to conduct such an inspection due to the ongoing COVID-19 pandemic, the FDA may issue a complete response letter or defer action on our applications, and approval of the products may be delayed or may not be granted.

The regulatory authorities also may, at any time following approval of a product for sale, audit our manufacturing facilities or those of our third-party contractors. If any such inspection or audit identifies a failure to comply with applicable regulations or if a violation of our product specifications or applicable regulations occurs independent of such an inspection or audit, we or the relevant regulatory authority may require remedial measures that may be costly and/or time-consuming for us or a third party to implement and that may include the temporary or permanent suspension of a clinical study or commercial sales or the temporary or permanent closure of a facility. Any such remedial measures imposed upon us or third parties with whom we contract could materially harm our business.

If we or any of our third-party manufacturers fail to maintain regulatory compliance, the FDA can impose regulatory sanctions including, among other things, refusal to approve a pending application for a new drug product or biologic product, or revocation of a pre-existing approval. As a result, our business, financial condition and results of operations may be materially harmed.

These factors could cause the delay of clinical studies, regulatory submissions, required approvals or commercialization of our product candidates, cause us to incur higher costs and prevent us from commercializing our products successfully. Furthermore, if our suppliers fail to meet contractual requirements, and we are unable to secure one or more replacement suppliers capable of production at a substantially equivalent cost, our preclinical and clinical studies may be delayed.

Our reliance on third parties requires us to share our trade secrets, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed.

Because we rely on third parties to manufacture our vectors and our product candidates, and because we collaborate with various organizations and academic institutions on the advancement of our gene therapy approach, we must, at times, share trade secrets with them. We seek to protect our proprietary technology in part by entering into confidentiality agreements and, if applicable, material transfer agreements, collaborative research agreements, consulting agreements or other similar agreements with our collaborators, advisors, employees and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information, such as trade secrets.

Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are inadvertently incorporated into the technology of others, or are disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may have a material adverse effect on our business.

In addition, these agreements typically restrict the ability of our collaborators, advisors, employees and consultants to publish data potentially relating to our trade secrets. Our academic collaborators typically have rights to publish data, provided that we are notified in advance and may delay publication for a specified time in order to secure our intellectual property rights arising from the collaboration. In other cases, publication rights are controlled exclusively by us, although in some cases we may share these rights with other parties. Despite our efforts to protect our trade secrets, our competitors may discover our trade secrets, either through breach of these agreements, independent development or publication of information including our trade secrets in cases where we do not have proprietary or otherwise protected rights at the time of publication. A competitor's discovery of our trade secrets would impair our competitive position and have an adverse impact on our business.

Risks related to commercialization of our product candidates

If we are unable to establish sales, distribution and marketing capabilities or enter into agreements with third parties to market and sell our product candidates, we will be unable to generate any product revenue.

We are in the preliminary stages of building our commercial organization. To successfully commercialize any of our current or future product candidates, if approved, we will need to develop these capabilities, either on our own or with others. The establishment and development of our own commercial team or the establishment of a contract sales force to market any product candidate we may develop will be expensive and time-consuming and could delay any product launch. Moreover, we cannot be certain that we will be able to successfully develop this capability. We may enter into collaborations regarding any approved product candidates with other entities to utilize their established marketing and distribution capabilities, but we may be unable to enter into such agreements on favorable terms, if at all. If any future collaborators do not commit sufficient resources to commercialize our product candidates, or we are unable to develop the necessary capabilities on our own, we will be unable to generate sufficient product revenue to sustain our business. We compete with many companies that currently have extensive, experienced and well-funded sales, distribution and marketing operations to recruit, hire, train and retain marketing and sales personnel. We also face competition in our search for third parties to assist us with the sales and marketing efforts of our product candidates, if approved. Without an internal team or the support of a third-party to perform marketing and sales functions, we may be unable to compete successfully against these more established companies.

If the market opportunities for our product candidates are smaller than we believe they are, our product revenues may be adversely affected and our business may suffer.

We focus our research and product development on treatments for serious lysosomal disorders. Our understanding of both the number of people who have these diseases, as well as the subset of people with these diseases who have the potential to benefit from treatment with our product candidates, are based on estimates. These estimates may prove to be incorrect and new studies may reduce the estimated incidence or prevalence of these diseases. The number of patients in the United States and elsewhere may turn out to be lower than expected or may not be otherwise amenable to treatment with our products, patients may become increasingly difficult to identify and access, and any approval we receive from regulatory agencies may be for a narrower indication and smaller patient population than anticipated, all of which would adversely affect our business, financial condition, results of operations and prospects.

The commercial success of any current or future product candidate will depend upon the degree of market acceptance by physicians, patients, third-party payors and others in the medical community.

Even if we obtain any regulatory approval for our product candidates, the commercial success of our product candidates will depend in part on the medical community, patients, and third-party payors accepting gene therapy products in general, and our product candidates in particular, as effective, safe and cost-effective. Any product that we bring to the market may not gain market acceptance by physicians, patients, third-party payors and others in the medical community. The degree of market acceptance of these product candidates, if approved for commercial sale, will depend on a number of factors, including:

- the potential efficacy and potential advantages over alternative treatments, including any similar generic treatments;
- the efficacy and safety as demonstrated in pivotal clinical trials and published in peer-reviewed journals;
- the prevalence and severity of any adverse events or side effects, including any limitations or warnings contained in a product's approved labeling or that are later found to be associated with a product, including in findings from long-term follow-up studies;
- the prevalence and severity of any side effects resulting from the conditioning regimen for the administration of our product candidates;
- the ability to offer the products for sale at competitive prices;
- the clinical indications for which the products are approved by the FDA or comparable regulatory agencies;

- the relative convenience and ease of dosing and 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 and timing of market introduction of competitive products;
- restrictions on how the product is distributed;
- publicity concerning our products or competing products and treatments; and
- favorable third-party insurance coverage and sufficient reimbursement.

Sales of medical products also depend on the willingness of physicians to prescribe the treatment, which is likely to be based on a determination by these physicians that the products are safe, therapeutically effective and cost effective. In addition, the inclusion or exclusion of products from treatment guidelines established by various physician groups and the viewpoints of influential physicians can affect the willingness of other physicians to prescribe the treatment. We cannot predict whether physicians, physicians' organizations, hospitals, other healthcare providers, government agencies or private insurers will determine that our product is safe, therapeutically effective and cost effective as compared with competing treatments.

Even if a product candidate displays a favorable efficacy and safety profile in preclinical and clinical studies, market acceptance of the product, if approved for commercial sale, will not be known until after it is launched. Our efforts to educate the medical community and third-party payors on the benefits of our product candidates may require significant resources and may never be successful. Such efforts to educate the marketplace may require more resources than are required by the conventional technologies marketed by our competitors. If these products do not achieve an adequate level of acceptance, we may not generate significant product revenue and may not become profitable.

If we obtain approval to commercialize our product candidates outside of the United States, a variety of risks associated with international operations could materially adversely affect our business.

We are currently conducting clinical trials for our product candidates in the United States, Canada and Australia, and plan to expand to other geographies. If any of our product candidates are approved for commercialization, we may enter into agreements with third parties to market them on a worldwide basis or in more limited geographical regions. We expect that we will be subject to additional risks related to entering into international business relationships, including:

- different regulatory requirements for approval of drugs and biologics in foreign countries;
- reduced protection for intellectual property rights;
- unexpected changes in tariffs, trade barriers and regulatory requirements;
- economic weakness, including inflation, or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenues, and other obligations incident to doing business in another country;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism, or natural disasters including earthquakes, typhoons, floods and fires.

The insurance coverage and reimbursement status of newly-approved products are uncertain. Failure to obtain or maintain adequate coverage and reimbursement for any of our product candidates, if approved, could limit our ability to market those products and decrease our ability to generate revenue.

The regulations that govern marketing approvals, pricing and reimbursement for new drugs vary widely from country to country. In the United States, recently enacted 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 marketed. 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 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 or their commercial launch of the product, possibly for lengthy time periods, and negatively impact the revenue 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 any product candidates we may develop obtain marketing approval.

Our ability to successfully commercialize our product candidates or any other products that we or they may develop also will depend in part on the extent to which reimbursement for these products and related treatments will be available from government health administration authorities, private health insurers, and other organizations. Government authorities and other third-party payors, such as private health insurers and health maintenance organizations, decide which medications they will pay for and establish reimbursement levels. The availability and extent of reimbursement by governmental and private payors is essential for most patients to be able to afford treatments. Sales of our product candidates will depend substantially, both domestically and abroad, on the extent to which the costs of our product candidates will be paid by health maintenance, managed care, pharmacy benefit and similar healthcare management organizations, or reimbursed by government health administration authorities, private health coverage insurers and other third-party payors. We may not be able to provide data sufficient to gain acceptance with respect to coverage and reimbursement. If reimbursement is not available, or is available only at limited levels, we may not be able to successfully commercialize our product candidates, if approved. Even if coverage is provided, the approved reimbursement amount may not be high enough to allow us to establish or maintain pricing sufficient to realize a sufficient return on our investment.

There is significant uncertainty related to the insurance coverage and reimbursement of newly approved products. In the United States, the principal decisions about reimbursement for new medicines are typically made by the Centers for Medicare & Medicaid Services, or CMS, an agency within the U.S. Department of Health and Human Services, or HHS, as CMS decides whether and to what extent a new medicine will be covered and reimbursed under Medicare. Private payors tend to follow CMS to a substantial degree. It is difficult to predict what CMS will decide with respect to reimbursement for fundamentally novel products such as ours, as there is no body of established practices and precedents for these new products. Patients who are provided medical treatment for their conditions generally rely on third-party payors to reimburse all or part of the costs associated with their treatment. Adequate coverage and reimbursement from governmental healthcare programs and commercial payors are critical to new product acceptance. Government authorities and other third-party payors, such as private health insurers and health maintenance organizations, decide which drugs and treatments they will cover and the amount of reimbursement. Coverage and reimbursement by a third-party payor may depend upon a number of factors, including the third-party payor's determination that use of a product is:

- a covered benefit under its health plan;
- safe, effective and medically necessary;
- appropriate for the specific patient;
- cost-effective; and
- neither experimental nor investigational.

A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Government authorities and other third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Outside the United States, international operations are generally subject to extensive governmental price controls and other market regulations, and we believe the increasing emphasis on cost-containment initiatives in Europe and certain other major markets where we plan to commercialize may put pressure on the pricing and usage of our product candidates. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems, and pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a product. 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 candidates to other available therapies. In general, the prices of medicines under such systems are substantially lower than in the United States. Other countries allow companies to fix their own prices for medicines, but monitor and control company profits. Additional foreign price controls or other changes in pricing regulation could restrict the amount that we are able to charge for our product candidates. Accordingly, in markets outside the United States, the reimbursement for our products may be reduced compared with the United States and may be insufficient to generate commercially reasonable revenues and profits.

Moreover, efforts by governmental and other third-party payors, in the United States and abroad, to cap or reduce healthcare costs may cause such organizations to limit both coverage and level of reimbursement for new products approved and, as a result, they may not cover or provide adequate payment for our product candidates. We expect to experience pricing pressures in connection with the sale of any of our product candidates, due to the trend toward managed healthcare, the increasing influence of health maintenance organizations and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs and surgical procedures and other treatments, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products.

Due to the novel nature of our technology and the potential for our product candidates to offer therapeutic benefit in a single administration, we face uncertainty related to pricing and reimbursement for these product candidates.

Our target patient populations are relatively small, as a result of which the pricing and reimbursement of our product candidates, if approved, must be adequate to support commercial infrastructure. If we are unable to obtain adequate levels of reimbursement, our ability to successfully market and sell our product candidates will be adversely affected. The manner and level at which reimbursement is provided for services related to our product candidates (e.g., for administration of our product to patients) is also important. Inadequate reimbursement for such services may lead to physician resistance and adversely affect our ability to market or sell our product candidates, if approved.

Healthcare legislative reform measures and constraints on national budget social security systems may have a material adverse effect on our business and results of operations.

The United States and many foreign jurisdictions have enacted or proposed legislative and regulatory changes affecting the healthcare system that could prevent or delay marketing approval of our product candidates or any future product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any product for which we obtain marketing approval. Changes in regulations, statutes or the interpretation of existing regulations could impact our business in the future by requiring, for example: (i) changes to our manufacturing arrangements; (ii) additions or modifications to product labeling; (iii) the recall or discontinuation of our products; or (iv) additional record-keeping requirements. If any such changes were to be imposed, they could adversely affect the operation of our business.

In the United States, there have been and continue to be a number of legislative initiatives to contain healthcare costs. For example, in 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or the ACA, was enacted, which, substantially changes the way healthcare is financed by both governmental and private insurers, and significantly impacts the U.S. pharmaceutical industry. The ACA, among other things, subjects biologic products to potential competition by lower-cost biosimilars, addresses a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected, increases the minimum Medicaid rebates owed by most manufacturers under the Medicaid Drug Rebate Program, increases the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program, extends the Medicaid Drug Rebate program to utilization of prescriptions of individuals enrolled in Medicaid managed care organizations, subjects manufacturers to new annual fees and taxes for certain branded prescription drugs, creates a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 70% (as of 2019) point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D, and provides incentives to programs that increase the federal government's comparative effectiveness research.

Since its enactment, there have been numerous judicial, administrative, executive, and legislative challenges to certain aspects of the ACA, and we expect there will be additional challenges and amendments to the ACA in the future. Members of Congress have introduced several pieces of legislation aimed at significantly revising or repealing 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 to initiate a special enrollment period from February 15, 2021 through August 15, 2021 for the purpose 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. It is unclear how other healthcare reform measures of the Biden administration or other efforts, if any, to challenge, repeal or replace the ACA will impact our business.

In addition, other legislative changes have been proposed and adopted in the United States since the ACA was enacted. In August 2011, the Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least \$1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. This includes aggregate reductions of Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013, and will remain in effect through 2030 unless additional Congressional action is taken; however, pursuant to the Coronavirus Aid, Relief, and Economic Security Act, also known as the CARES Act, these reductions have been suspended from May 1, 2020 through December 31, 2020 due to the COVID-19 pandemic. The Consolidated Appropriations Act of 2021, extended the suspension period to March 31, 2021. An Act to Prevent Across-the-Board Direct Spending Cuts, and for Other Purposes, signed into law on April 14, 2021, has extended the suspension period to December 31, 2021. In January 2013, the American Taxpayer Relief Act of 2012, was signed into law, which, among other things, further reduced Medicare payments to several providers, including hospitals

and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

There has been increasing legislative and enforcement interest in the United States with respect to specialty drug pricing practices. Specifically, there have been several recent U.S. Congressional inquiries and proposed federal and state legislation designed to, among other things, bring more transparency to drug pricing, reduce the cost of prescription drugs under Medicare, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. At the federal level, President Biden signed an Executive Order on July 9, 2021 affirming the administration's policy to (i) support legislative reforms that would lower the prices of prescription drug and biologics, including by allowing Medicare to negotiate drug prices, by imposing inflation caps, and, by supporting the development and market entry of lower-cost generic drugs and biosimilars; and (ii) support the enactment of a public health insurance option. Among other things, the executive order directs the FDA to continue to clarify and improve the approval framework for biosimilars, including the standards for interchangeability of biological products, facilitate the development and approval of biosimilar and interchangeable products, clarify existing requirements and procedures related to the review and submission of BLAs, and identify and address any efforts to impede biosimilar competition. Additionally the executive order also directs HHS to provide a report on actions to combat excessive pricing of prescription drugs, enhance the domestic drug supply chain, reduce the price that the Federal government pays for drugs, and address price gouging in the industry; and directs the FDA to work with states and Indian Tribes that propose to develop section 804 Importation Programs in accordance with the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, and the FDA's implementing regulations. FDA released such implementing regulations on September 24, 2020, which went into effect on November 30, 2020, providing guidance for states to build and submit importation plans for drugs from Canada. Further, on November 20, 2020 CMS issued an Interim Final Rule implementing the Most Favored Nation, or MFN, Model under which Medicare Part B reimbursement rates will be calculated for certain drugs and biologicals based on the lowest price drug manufacturers receive in Organization for Economic Cooperation and Development countries with a similar gross domestic product per capita. The MFN Model regulations mandate participation by identified Part B providers and would have applied to all U.S. states and territories for a seven-year period beginning January 1, 2021, and ending December 31, 2027. The MFN is currently subject to ongoing litigation. Further, authorities in Canada have passed rules designed to safeguard the Canadian drug supply from shortages. If implemented, importation of drugs from Canada and the MFN Model may materially and adversely affect the price we receive for any of our product candidates. Additionally, on December 2, 2020, HHS published a regulation removing safe harbor protection for price reductions from pharmaceutical manufacturers to plan sponsors under Part D, either directly or through pharmacy benefit managers, unless the price reduction is required by law. The rule also creates a new safe harbor for price reductions reflected at the point-of-sale, as well as a safe harbor for certain fixed fee arrangements between pharmacy benefit managers and manufacturers. On December 2, 2020, HHS published a regulation removing safe harbor protection for price reductions from pharmaceutical manufacturers to plan sponsors under Part D, either directly or through pharmacy benefit managers, unless the price reduction is required by law. The rule also creates a new safe harbor for price reductions reflected at the point-of-sale, as well as a safe harbor for certain fixed fee arrangements between pharmacy benefit managers and manufacturers. Further, implementation of this change and new safe harbors for point-of-sale reductions in price for prescription pharmaceutical products and pharmacy benefit manager service fees are currently under review by the Biden administration and may be amended or repealed. Although a number of these and other proposed measures may require authorization through additional legislation to become effective, and the Biden administration may reverse or otherwise change these measures, both the Biden administration and Congress have indicated that it will continue to seek new legislative measures to control drug costs.

We expect that the healthcare reform measures that have been adopted and may be adopted in the future, may result in more rigorous coverage criteria and in additional downward pressure on the price that we receive for any approved product and could seriously harm our future revenues. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private third-party payors.

There have been, and likely will continue to be, legislative and regulatory proposals at the foreign, federal and state levels directed at broadening the availability of healthcare and containing or lowering the cost of healthcare. We cannot predict the initiatives that may be adopted in the future. The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to contain or reduce costs of healthcare and/or impose price controls may adversely affect:

- the demand for our drug product candidates, if we obtain regulatory approval;
- our ability to set a price that we believe is fair for our products;
- our ability to generate revenue and achieve or maintain profitability;
- the level of taxes that we are required to pay; and
- the availability of capital.

Any denial in coverage or reduction in reimbursement from Medicare or other government programs may result in a similar denial or reduction in payments from private payors, which may adversely affect our future profitability.

Inadequate funding for the FDA and other government agencies could hinder their ability to hire and retain key leadership and other personnel, prevent new products and services from being developed or commercialized in a timely manner or otherwise prevent those agencies from performing normal business functions on which the operation of our business may rely, which could negatively impact our business.

The ability of the FDA to review and approve new products can be affected by a variety of factors, including government budget and funding levels, ability to hire and retain key personnel and accept the payment of user fees, and statutory, regulatory, and policy changes. Average review times at the agency have fluctuated in recent years as a result. In addition, government funding of other agencies on which our operations may rely, including those that fund research and development activities, is subject to the political process, which is inherently fluid and unpredictable.

Disruptions at the FDA and other agencies may also slow the time necessary for new drugs to be reviewed and/or approved by necessary government agencies, 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 agencies, such as the FDA, have had to furlough critical FDA and other government employees and stop critical activities. Since March 2020 when foreign and domestic inspections of facilities were largely placed on hold, the FDA has been working to resume routine surveillance, bioresearch monitoring and pre-approval inspections on a prioritized basis. The FDA has developed a rating system to assist in determining when and where it is safest to conduct prioritized domestic inspections. As of May 2021, certain inspections, such as foreign preapproval, surveillance, and for-cause inspections that are not deemed mission-critical, remain temporarily postponed. In April 2021, the FDA issued guidance for industry formally announcing plans to employ remote interactive evaluations, using risk management methods, to meet user fee commitments and goal dates and in May 2021 announced plans to continue progress toward resuming standard operational levels. Should the FDA determine that an inspection is necessary for approval and an inspection cannot be completed during the review cycle due to restrictions on travel, and the FDA does not determine a remote interactive evaluation to be adequate, the FDA has stated that it generally intends to issue a complete response letter or defer action on the application until an inspection can be completed. Additionally, as of May 26, 2021, the FDA noted it is continuing to ensure timely reviews of applications for medical products during the ongoing COVID-19 pandemic in line with its user fee performance goals and conducting mission critical domestic and foreign inspections to ensure compliance of manufacturing facilities with FDA quality standards. However, the FDA may not be able to continue its current pace and approval timelines could be extended, including where a pre-approval inspection or an inspection of clinical sites is required and due to the ongoing COVID-19 pandemic and travel restrictions FDA is unable to complete such required inspections during the review period. In 2020 and 2021, a number of companies announced receipt of complete response letters due to the FDA's inability to complete required inspections for their applications. Regulatory authorities outside the U.S. may adopt similar restrictions or other policy measures in response to the COVID-19 pandemic and may experience delays in their regulatory activities. If a prolonged government shutdown occurs, it could significantly impact the ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business. Further, future shutdowns of other government agencies, such as the SEC, may also impact our business through review of our public filings and our ability to access the public markets.

Any contamination in our manufacturing process, shortages of materials or failure of any of our key suppliers to deliver necessary components could result in interruption in the supply of our product candidates and delays in our clinical development or commercialization schedules.

Given the nature of biologics manufacturing, there is a risk of contamination in our manufacturing processes. Any contamination could materially adversely affect our ability to produce product candidates on schedule and could, therefore, harm our results of operations and cause reputational damage.

Some of the materials required in our manufacturing process are derived from biologic sources. Such materials are difficult to procure and may be subject to contamination or recall. A material shortage, contamination, recall or restriction on the use of biologically derived substances in the manufacture of our product candidates could adversely impact or disrupt the commercial manufacturing or the production of clinical material, which could materially and adversely affect our development timelines and our business, financial condition, results of operations and prospects.

Risks related to our business operations

Our gene therapy approach utilizes lentiviral vectors derived from viruses, which may be perceived as unsafe or may result in unforeseen adverse events. Negative public opinion and increased regulatory scrutiny of gene therapy and genetic research may damage public perception of our product candidates or adversely affect our ability to conduct our business or obtain regulatory approvals for our product candidates.

Gene therapy remains a novel technology, with only a limited number of gene therapy products approved to date. Public perception may be influenced by claims that gene therapy is unsafe, and gene therapy may not gain the acceptance of the public or the medical community. In particular, our success will depend upon physicians specializing in the treatment of those diseases that our product candidates target prescribing treatments that involve the use of our product candidates in lieu of, or in addition to, existing treatments they are already familiar with and for which greater clinical data may be available. More restrictive government regulations or negative public opinion would have a negative effect on our business or financial condition and may delay or impair the development and commercialization of our product candidates or demand for any products we may develop. For example, earlier gene therapy trials led to several well-publicized adverse events, including cases of leukemia, myelodysplastic syndromes and deaths seen in other trials using other vectors. Adverse events in our clinical studies or discovered in long-term follow-up, even if not ultimately attributable to our product candidates (such as the many adverse events that typically arise from the conditioning process), or adverse events in other lentiviral gene therapy trials, and the resulting publicity could result in a decline in our stock price, increased governmental regulation, unfavorable public perception, potential regulatory delays in the testing or approval of our potential product candidates, stricter labeling requirements for those product candidates that are approved and a decrease in demand for any such product candidates.

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

We are highly dependent on principal members of our executive team and key employees, the loss of whose services may adversely impact the achievement of our objectives. While we have entered into employment agreements with each of our executive officers, any of them could leave our employment at any time, as all of our employees are “at will” employees. We do not maintain “key person” insurance policies on the lives of these individuals or the lives of any of our other employees. The loss of the services of one or more of our current employees might impede the achievement of our research, development and commercialization objectives. Recruiting and retaining other qualified employees, consultants and advisors for our business, including scientific and technical personnel, will also be critical to our success. There is currently a shortage of skilled executives in our industry, which is likely to continue. As a result, competition for skilled personnel, including in gene therapy research and vector manufacturing, is intense and the turnover rate can be high. We may not be able to attract and retain personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for individuals with similar skill sets. In addition, our ability to recruit and retain qualified personnel could be impacted by other factors, such as remote or hybrid working arrangements, including those resulting from the ongoing COVID-19 pandemic, which could impact employees’ productivity and morale, as well as any failure to succeed in preclinical or clinical trials. The inability to recruit or the loss of the services of any executive, key employee, consultant or advisor may impede the progress of our research, development and commercialization objectives.

We will need to expand our operations and we may experience difficulties in managing this growth, which could disrupt our operations.

As we mature, we expect to rapidly expand our full-time employee base and to hire more consultants and contractors. Our management may need to divert a disproportionate amount of its attention away from our day-to-day activities and devote a substantial amount of time to managing these growth activities. We may not be able to effectively manage the expansion of our operations, which may result in weaknesses in our infrastructure, operational mistakes, loss of business opportunities, loss of employees and reduced productivity among remaining employees. Our expected growth could require significant capital expenditures and may divert financial resources from other projects, such as the development of additional product candidates. If our management is unable to effectively manage our growth, our expenses may increase more than expected, our ability to generate and/or grow revenues could be reduced, and we may not be able to implement our business strategy. Our future financial performance and our ability to commercialize product candidates and compete effectively will depend, in part, on our ability to effectively manage any future growth.

If we are unable to manage expected growth in the scale and complexity of our operations, our performance may suffer.

If we are successful in executing our business strategy, we will need to expand our managerial, operational, financial and other systems and resources to manage our operations, continue our research and development activities and, in the longer term, build a commercial infrastructure to support commercialization of any of our product candidates that are approved for sale. Future growth would impose significant added responsibilities on members of management. It is likely that our management, finance, development

personnel, systems and facilities currently in place may not be adequate to support this future growth. Our need to effectively manage our operations, growth and product candidates requires that we continue to develop more robust business processes and improve our systems and procedures in each of these areas and to attract and retain sufficient numbers of talented employees. We may be unable to successfully implement these tasks on a larger scale and, accordingly, may not achieve our research, development and growth goals.

Our employees, principal investigators, consultants and commercial partners may engage in misconduct or other improper activities, including non-compliance with regulatory standards and requirements and insider trading.

We are exposed to the risk of fraud or other misconduct by our employees, principal investigators, consultants and commercial partners. Misconduct by these parties could include intentional failures to comply with the regulations of the FDA or of other foreign regulatory authorities, provide accurate information to the FDA and other foreign regulatory authorities, comply with healthcare fraud and abuse laws and regulations in the United States and abroad, report financial information or data accurately or disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, misconduct, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Such misconduct could also involve the improper use of information obtained in the course of clinical studies, which could result in regulatory sanctions and cause serious harm to our reputation. We have adopted a code of conduct applicable to all of our employees, but it is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to comply with these laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of significant fines or other sanctions.

We are subject to certain U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations. We can face serious consequences for violations.

Among other matters, U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations, which are collectively referred to as Trade Laws, prohibit companies and their employees, agents, clinical research organizations, legal counsel, accountants, consultants, contractors, and other partners from authorizing, promising, offering, providing, soliciting, or receiving directly or indirectly, corrupt or improper payments or anything else of value to or from recipients in the public or private sector. Violations of Trade Laws can result in substantial criminal fines and civil penalties, imprisonment, the loss of trade privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We also expect our non-U.S. activities to increase in time. We plan to engage third parties for clinical trials and/or to obtain necessary permits, licenses, patent registrations, and other regulatory approvals and we can be held liable for the corrupt or other illegal activities of our personnel, agents, or partners, even if we do not explicitly authorize or have prior knowledge of such activities. The failure to comply with laws governing international business practices may result in substantial civil and criminal penalties and suspension or debarment from government contracting. The SEC also may suspend or bar issuers from trading securities on U.S. exchanges for violations of the United States Foreign Corrupt Practices Act's accounting provisions.

We may be subject, directly or indirectly, to federal and state healthcare fraud and abuse laws, false claims laws health information privacy and security laws, and other health care laws and regulations. If we are unable to comply, or have not fully complied, with such laws, we could face substantial penalties.

If we obtain FDA approval for any of our product candidates and begin commercializing those products in the United States, our operations will be directly, or indirectly through our prescribers, customers and purchasers, subject to various federal and state fraud and abuse laws and regulations, including, without limitation, the federal Health Care Program Anti-Kickback Statute, the federal civil and criminal False Claims Act and Physician Payments Sunshine Act and regulations. These laws will impact, among other things, our proposed sales, marketing and educational programs. In addition, we may be subject to patient privacy laws by both the federal government and the states in which we conduct our business. The laws that will affect our operations include, but are not limited to:

- the federal Anti-Kickback Statute, which prohibits, among other things, knowingly and willfully soliciting, receiving, offering or paying any remuneration (including any kickback, bribe or rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce, or in return for, either the referral of an individual, or the purchase, lease, order or recommendation of any good, facility, item or service for which payment may be made, in whole or in part, under a federal healthcare program, such as the Medicare and Medicaid programs. A person or entity can be found guilty of violating the statute without actual knowledge of the statute or specific intent to violate it. In addition, 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 False Claims Act, or FCA. The Anti-Kickback Statute has been interpreted to apply to arrangements between

pharmaceutical manufacturers on the one hand and prescribers, purchasers, and formulary managers on the other. There are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution. On December 2, 2020, HHS published a regulation removing safe harbor protection for price reductions from pharmaceutical manufacturers to plan sponsors under Part D, either directly or through pharmacy benefit managers, unless the price reduction is required by law. The rule also creates a new safe harbor for price reductions reflected at the point-of-sale, as well as a safe harbor for certain fixed fee arrangements between pharmacy benefit managers and manufacturers. Pursuant to an order entered by the U.S. District Court for the District of Columbia, the portion of the rule eliminating safe harbor protection for certain rebates related to the sale or purchase of a pharmaceutical product from a manufacturer to a plan sponsor under Medicare Part D has been delayed to January 1, 2023. Further, implementation of this change and new safe harbors for point-of-sale reductions in price for prescription pharmaceutical products and pharmacy benefit manager service fees are currently under review by the Biden administration and may be amended or repealed;

- federal civil and criminal false claims laws and civil monetary penalty laws, including the FCA, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, false or fraudulent claims for payment to, or approval by Medicare, Medicaid, or other federal healthcare programs, knowingly making, using or causing to be made or used a false record or statement material to a false or fraudulent claim or an obligation to pay or transmit money to the federal government, or knowingly concealing or knowingly and improperly avoiding or decreasing or concealing an obligation to pay money to the federal government. Manufacturers can be held liable under the FCA even when they do not submit claims directly to government payors if they are deemed to “cause” the submission of false or fraudulent claims. The FCA also permits a private individual acting as a “whistleblower” to bring actions on behalf of the federal government alleging violations of the FCA and to share in any monetary recovery;
- the anti-inducement law, which prohibits, among other things, the offering or giving of remuneration, which includes, without limitation, any transfer of items or services for free or for less than fair market value (with limited exceptions), to a Medicare or Medicaid beneficiary that the person knows or should know is likely to influence the beneficiary’s selection of a particular supplier of items or services reimbursable by a federal or state governmental program;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created new federal criminal statutes that prohibit a person from knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program or obtain, by means of false or fraudulent pretenses, representations or promises, any of the money or property owned by, or under the custody or control of, any healthcare benefit program, regardless of the payor (e.g., public or private) and knowingly and willfully falsifying, concealing or covering up by any trick or device a material fact or making any materially false statements in connection with the delivery of, or payment for, healthcare benefits, items or services relating to healthcare matters; 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;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 and their respective implementing regulations, which impose requirements on certain covered healthcare providers, health plans, and healthcare clearinghouses as well as their respective business associates that perform services for them that involve the use, or disclosure of, individually identifiable health information relating to the privacy, security and transmission of individually identifiable health information;
- the federal transparency requirements under the ACA, including the provision commonly referred to as the Physician Payments Sunshine Act, which requires manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children’s Health Insurance Program to report annually to the U.S. Department of Health and Human Services information related to payments or other transfers of value made to physicians (currently defined to include doctors, dentists, optometrists, podiatrists and chiropractors), physician assistants, nurse practitioners, clinical nurse specialists, certified registered nurse anesthetists and teaching hospitals, as well as ownership and investment interests held by the physicians described above and their immediate family members.
- federal government price reporting laws, which require us to calculate and report complex pricing metrics in an accurate and timely manner to government programs; and
- federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers

Additionally, we are subject to state and foreign equivalents of each of the healthcare laws described above, among others, some of which may be broader in scope and may apply regardless of the payor. Many U.S. states have adopted laws similar to the federal Anti-Kickback Statute, some of which apply to the referral of patients for healthcare services reimbursed by any source, not just governmental payors, including private insurers. In addition, some states have passed laws that require pharmaceutical companies to comply with the April 2003 Office of Inspector General Compliance Program Guidance for Pharmaceutical Manufacturers and/or the Pharmaceutical Research and Manufacturers of America’s Code on Interactions with Healthcare Professionals. Several states also

impose other marketing restrictions or require pharmaceutical companies to make marketing or price disclosures to the state. There are ambiguities as to what is required to comply with these state requirements and if we fail to comply with an applicable state law requirement we could be subject to penalties. Finally, there are state and foreign laws governing the privacy and security of health information, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

The distribution of pharmaceutical products is subject to additional requirements and regulations, including extensive record-keeping, licensing, storage and security requirements intended to prevent the unauthorized sale of pharmaceutical products.

The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. Federal and state enforcement bodies have recently increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. Ensuring business arrangements comply with applicable healthcare laws, as well as responding to possible investigations by government authorities, can be time- and resource-consuming and can divert a company's attention from the business.

The failure to comply with any of these laws or regulatory requirements subjects entities to possible legal or regulatory action. Depending on the circumstances, failure to meet applicable regulatory requirements can result in significant civil, criminal and administrative penalties, damages, fines, disgorgement, individual imprisonment, exclusion from participation in federal and state funded healthcare programs (such as Medicare and Medicaid), contractual damages and the curtailment or restructuring of our operations, as well as additional reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws. Any action for violation of these laws, even if successfully defended, could cause a pharmaceutical manufacturer to incur significant legal expenses and divert management's attention from the operation of the business. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found not to be in compliance with applicable laws, that person or entity may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs. Prohibitions or restrictions on sales or withdrawal of future marketed products could materially affect business in an adverse way.

Efforts to ensure that our business arrangements will comply with applicable healthcare laws may involve substantial costs. It is possible that governmental and enforcement authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law interpreting applicable fraud and abuse or other healthcare laws and regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of civil, criminal and administrative penalties, damages, disgorgement, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations. In addition, the approval and commercialization of any of our candidates outside the United States will also likely subject us to foreign equivalents of the healthcare laws mentioned above, among other foreign laws.

Failure to comply with health and data protection laws and regulations could lead to government enforcement actions (which could include civil or criminal penalties), private litigation, and/or adverse publicity and could negatively affect our operating results and business.

We and any potential collaborators may be subject to federal, state, and foreign data protection laws and regulations (i.e., laws and regulations that address privacy and data security). In the United States, numerous federal and state laws and regulations, including federal health information privacy laws, state data breach notification laws, state health information privacy laws, and federal and state consumer protection laws (e.g., Section 5 of the Federal Trade Commission Act), that govern the collection, use, disclosure and protection of health-related and other personal information could apply to our operations or the operations of our collaborators. In addition, we may obtain health information from third parties (including research institutions from which we obtain clinical trial data) that are subject to privacy and security requirements under HIPAA, as amended by HITECH. Depending on the facts and circumstances, we could be subject to civil, criminal, and administrative penalties if we knowingly obtain, use, or disclose individually identifiable health information maintained by a HIPAA-covered entity in a manner that is not authorized or permitted by HIPAA.

Compliance with U.S. and international data protection laws and regulations could require us to take on more onerous obligations in our contracts, restrict our ability to collect, use and disclose data, or in some cases, impact our ability to operate in certain jurisdictions. Failure to comply with these laws and regulations could result in government enforcement actions (which could include civil, criminal and administrative penalties), private litigation, and/or adverse publicity and could negatively affect our operating results and business. Moreover, clinical trial patients, employees and other individuals about whom we or our potential

collaborators obtain personal information, as well as the providers who share this information with us, may limit our ability to collect, use and disclose the information. Claims that we have violated individuals' privacy rights, failed to comply with data protection laws, or breached our contractual obligations, even if we are not found liable, could be expensive and time-consuming to defend and could result in adverse publicity that could harm our business.

European data collection is governed by restrictive regulations governing the use, processing and cross-border transfer of personal information.

We currently plan to conduct clinical trials in the European Union, or EU, and the United Kingdom, or UK, and as a result will be subject to additional privacy restrictions. The collection, use, disclosure, transfer or other processing of personal health data in the EU is governed by the provisions of the General Data Protection Regulation, or GDPR. The GDPR is wide-ranging in scope and imposes numerous requirements on companies that process personal data, including requirements relating to processing health and other sensitive data, providing information to individuals regarding data processing activities, obtaining consent from individuals to whom the data processing relates, imposing notification of personal data breaches to the competent national data protection authorities, implementing safeguards in connection with the security and confidentiality of the personal data, accountability requirements and taking certain measures when engaging third-party processors. The GDPR informs our obligations with respect to any clinical trials conducted in the European Economic Area by expanding the definition of personal data to include coded data and requiring changes to informed consent practices and more detailed notices for clinical trial subjects and investigators. In addition, the GDPR imposes strict rules on the transfer of personal data out of the European Union, including to the United States, and as a result increases scrutiny that such rules may apply to transfers of personal data from any clinical trial sites located in the EU and the UK to the United States. The GDPR also permits data protection authorities to require destruction of improperly gathered or used personal data and/or impose substantial fines for violations of the GDPR, which can be up to four percent of global revenues or 20 million Euros, whichever is greater, and confers a private right of action on data subjects and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies, and obtain compensation for damages resulting from violations of the GDPR. In addition, the GDPR provides that European Union member states may make their own further laws and regulations limiting the processing of personal data, including genetic, biometric, or health data.

Given the breadth and depth of its obligations, complying with the GDPR's requirements is rigorous and time intensive and requires significant resources and assessment of our technologies, systems and practices, as well as those of any third-party collaborators, service providers, contractors, or consultants that process or transfer personal data collected in the European Union.

Further, the UK exited the EU effective January 31, 2020, subject to a transition period that ended December 31, 2020. Following the UK's withdrawal from the EU on January 31, 2020, pursuant to the transitional arrangements agreed to between the UK and EU, the GDPR continued to have effect under law in the UK, and continued to do so until December 31, 2020 as if the UK remained a member state of the EU for such purposes. Following December 31, 2020, and the expiry of those transitional arrangements, the data protection obligations of the GDPR continue to apply to UK-related processing of personal data in substantially unvaried form and fashion under the so-called "UK GDPR" (i.e., the GDPR as it continues to form part of UK law by virtue of section 3 of the European Union (Withdrawal) Act 2018, as amended (including by the various Data Protection, Privacy and Electronic Communications (Amendments etc.) (EU Exit) Regulations)).

We face potential product liability, and, if successful claims are brought against us, we may incur substantial liability and costs. If the use of our product candidates harms patients, or is perceived to harm patients even when such harm is unrelated to our product candidates, our regulatory approvals could be revoked or otherwise negatively impacted and we could be subject to costly and damaging product liability claims.

The use of our product candidates in clinical studies and the sale of any products for which we obtain marketing approval exposes us to the risk of product liability claims. Product liability claims might be brought against us by consumers, healthcare providers, pharmaceutical companies or others selling or otherwise coming into contact with our products. There is a risk that our product candidates may induce adverse events. If we cannot successfully defend against product liability claims, we could incur substantial liability and costs. In addition, regardless of merit or eventual outcome, product liability claims may result in:

- the impairment of our business reputation;
- the withdrawal of clinical study participants;
- costs due to related litigation;
- the distraction of management's attention from our primary business;
- substantial monetary awards to patients or other claimants;
- the inability to commercialize our product candidates; and

- decreased demand for our product candidates, if approved for commercial sale.

We carry master product liability insurance of \$5.0 million per occurrence and \$5.0 million in the aggregate in the United States. For studies conducted in Australia and Canada, we maintain local admitted policies with varying limits. We believe our product liability insurance coverage is sufficient in light of our current clinical programs; however, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. If and when we obtain marketing approval for product candidates, we intend to expand our insurance coverage to include the sale of commercial products; however, we may be unable to obtain product liability insurance on commercially reasonable terms or in adequate amounts. On occasion, large judgments have been awarded in class action lawsuits based on drugs or medical treatments that had unanticipated adverse effects. A successful product liability claim or series of claims brought against us could cause our stock price to decline and, if judgments exceed our insurance coverage, could adversely affect our results of operations and business.

Patients with the diseases targeted by certain of our product candidates are often already in severe and advanced stages of disease and have both known and unknown significant pre-existing and potentially life-threatening health risks. During the course of treatment, patients may suffer adverse events, including death, for reasons that may be related to our product candidates. Such events could subject us to costly litigation, require us to pay substantial amounts of money to injured patients, delay, negatively impact or end our opportunity to receive or maintain regulatory approval to market our products, or require us to suspend or abandon our commercialization efforts. Even in a circumstance in which we do not believe that an adverse event is related to our products, the investigation into the circumstance may be time-consuming or inconclusive. These investigations may interrupt our sales efforts, delay our regulatory approval process in other countries, or impact and limit the type of regulatory approvals our product candidates receive or maintain. As a result of these factors, a product liability claim, even if successfully defended, could have a material adverse effect on our business, financial condition or results of operations.

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 have a material adverse effect on the success of 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. 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 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. Furthermore, environmental laws and regulations are complex, change frequently and have tended to become more stringent. We cannot predict the impact of such changes and cannot be certain of our future compliance. 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. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

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 or other work-related injuries, this insurance may not provide adequate coverage against potential liabilities. 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. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions or liabilities, which could materially adversely affect our business, financial condition, results of operations and prospects.

We might not be able to utilize a significant portion of our net operating loss carryforwards and research and development tax credit carryforwards.

As of December 31, 2020, we had federal and state net operating loss carryforwards of \$214.0 million and \$201.6 million, respectively, and federal and state research and development tax credit carryforwards of approximately \$3.7 million and \$0.7 million, respectively. If not utilized, the net operating loss carryforwards and research and development credits will generally expire at various dates through 2038 (other than federal net operating loss carryforwards generated in taxable years beginning after December 31, 2017, which are not subject to expiration and generally may not be carried back to prior taxable years except that net operating losses generated in 2018, 2019 and 2020 may be carried back five taxable years). These net operating loss and tax credit carryforwards could expire unused and be unavailable to offset future income tax liabilities. In addition, under Section 382 of the Internal Revenue Code of 1986, as amended, or the Code, and corresponding provisions of state law, if a corporation undergoes an "ownership change," which is generally defined as a greater than 50 percentage point change, by value, in its equity ownership over a three-year period, the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes to offset its post-change

income may be limited. We may have experienced ownership changes in the past. We may also experience ownership changes in the future as a result of subsequent shifts in our stock ownership, some of which may be outside of our control. If an ownership change occurred or occurs and our ability to use our historical net operating loss and tax credit carryforwards is materially limited, or if our research and development carryforwards are adjusted, it would harm our future operating results by effectively increasing our future tax obligations. For taxable years beginning after December 31, 2020, deductions for federal net operating losses arising in taxable years beginning after December 31, 2017 may only offset 80% of taxable income.

Risks related to our intellectual property

Third-party claims of intellectual property infringement may prevent or delay our development and commercialization efforts.

Our commercial success depends in part on avoiding infringement of the patents and proprietary rights of third parties. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries, including patent infringement lawsuits, interferences, oppositions and *inter partes* reexamination proceedings before the U.S. Patent and Trademark Office, or USPTO, and corresponding foreign patent offices. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we are pursuing development candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our product candidates may be subject to claims of infringement of the patent rights of third parties.

Third parties may assert that we or our licensors are employing their proprietary technology without authorization. There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates. In particular, we are aware of issued patents in the United States that cover the lentiviral vectors used in the manufacture of our product candidates. While we believe that we have reasonable defenses against a claim of infringement, potentially including that certain of these patents are expected to expire prior to commercializing our product candidates, if approved, in the United States, there can be no assurance that we will prevail in any such action by the holder of these patents. In the event that the holder of these patents seeks to enforce its patent rights and our defenses against a claim of infringement are unsuccessful, we may not be able to commercialize our product candidates in the United States, if approved, without first obtaining a license to some or all of these patents, which may not be available on commercially reasonable terms or at all. In addition, the defense of any claim of infringement, even if successful, is time-consuming, expensive and diverts the attention of our management from our ongoing business operations.

Because patent applications can take many years to issue, there may be currently pending patent applications which may later result in issued patents that our product candidates may infringe or be alleged to infringe. In addition, third parties may obtain patents in the future and claim that use of our or our licensors' technologies infringes upon these patents. If any third-party patents were held by a court of competent jurisdiction to cover the manufacturing process of any of our product candidates, any molecules formed during the manufacturing process or any final product itself, the holders of any such patents may be able to block our ability to commercialize such product candidate unless we obtained a license under the applicable patents, or until such patents expire.

Similarly, if any third-party patents were held by a court of competent jurisdiction to cover aspects of our formulations, processes for manufacture or methods of use, including combination therapy, the holders of any such patents may be able to block our ability to develop and commercialize the applicable product candidate unless we obtained a license or until such patent expires. In either case, such a license may not be available on commercially reasonable terms or at all.

Parties making claims against us may obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize one or more of our product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. In the event of a successful claim of infringement against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, pay royalties, redesign our infringing products or obtain one or more licenses from third parties, which may be impossible or require substantial time and monetary expenditure. Even in the absence of a finding of infringement, we may choose to obtain a license, if such a license is available. A successful claim of patent or other intellectual property infringement against us could materially adversely affect our business, results of operations and financial condition.

Our rights to develop and commercialize our product candidates are subject, in part, to the terms and conditions of licenses granted to us by others.

We depend upon the intellectual property rights granted to us under licenses from third parties that are important or necessary to the development of our technology and products, including technology related to our manufacturing process and our gene therapy product candidates. In particular, we have licensed certain intellectual property rights and know-how from the University Health

Network (relevant to AVR-RD-01 and our Fabry program) and affiliates of Lund University (relevant to AVR-RD-02 and our Gaucher type 1 program). In addition, we have in-licensed patents and patent applications from BioMarin Pharmaceutical Inc., or BioMarin (relevant to AVR-RD-03 and our Pompe program), GenStem Therapeutics, Inc., or GenStem (relevant to AVR-RD-04 and our cystinosis program) and The University of Manchester (relevant to AVR-RD-05 and our Hunter program), directed to compositions and methods related to the manufacture and use of AVR-RD-03, AVR-RD-04 and AVR-RD-05, respectively. Any termination of these licenses could result in the loss of significant rights and could harm or prevent our ability to commercialize our product candidates.

Each of our existing licenses are exclusive but are limited to particular fields, such as Fabry disease, cystinosis, Gaucher disease type 1, Hunter syndrome, or Pompe disease, and are subject to certain retained rights. Absent an amendment or additional agreement, we may not have the right to use intellectual property in-licensed for one of our programs for another program. In addition, licenses that we may enter into in the future may not provide exclusive rights to use such intellectual property and technology in all relevant fields of use and in all territories in which we may wish to develop or commercialize our technology and products in the future. As a result, we may not be able to prevent competitors from developing and commercializing competitive products in territories included in all of our licenses. Licenses to additional third-party technology that may be required for our development programs may not be available in the future or may not be available on commercially reasonable terms, or at all, which could have a material adverse effect on our business and financial condition.

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. For example, pursuant to each of our intellectual property licenses with GenStem, BioMarin, the rights holders associated with Lund University, and The University of Manchester, our licensors retain control of such activities. Therefore, we cannot be certain that these patents and applications will be prosecuted, maintained and enforced in a manner consistent with the best interests of our business. If our licensors fail to maintain such patents, or lose rights to those patents or patent applications, the rights we have licensed may be reduced or eliminated and our right to develop and commercialize any of our products that are the subject of such licensed rights could be adversely affected.

Our current license agreements impose, and we expect that future license agreements that we may enter into will impose, various obligations, including diligence and certain payment obligations. If we fail to satisfy our obligations, the licensor may have the right to terminate the agreement. Disputes may arise between us and any of our licensors regarding intellectual property subject to such agreements and other issues. Such disputes over intellectual property that we have licensed or the terms of our license agreements may prevent or impair our ability to maintain our current arrangements on acceptable terms, or at all, or may impair the value of the arrangement to us. Any such dispute could have a material adverse effect on our business. If we cannot maintain a necessary license agreement or if the agreement is terminated, we may be unable to successfully develop and commercialize the affected product candidates.

If we are unable to obtain and maintain patent protection for our product candidates, or if the scope of the patent protection obtained is not sufficiently broad, our competitors could develop and commercialize products similar or identical to ours, and our ability to successfully commercialize our product candidates may be adversely affected.

Our ability to compete effectively will depend, in part, on our ability to maintain the proprietary nature of our technology and manufacturing processes. We rely on manufacturing and other know-how, patents, trade secrets, trademarks, license agreements and contractual provisions to establish our intellectual property rights and protect our products. These legal means, however, afford only limited protection and may not adequately protect our rights. The failure to obtain, maintain, enforce or defend such intellectual property rights, for any reason, could allow third parties to make competing products or impact our ability to develop, manufacture and market our products, if approved, on a commercially viable basis, or at all, which could have a material adverse effect on our financial condition and results of operations.

In particular, we rely primarily on trade secrets, know-how and other unpatented technology, which are difficult to protect. Although we seek such protection in part by entering into confidentiality agreements with our vendors, employees, consultants and others who may have access to proprietary information, we cannot be certain that these agreements will not be breached, adequate remedies for any breach would be available or our trade secrets, know-how and other unpatented proprietary technology will not otherwise become known to or be independently developed by our competitors. If we are unsuccessful in protecting our intellectual property rights, sales of our products may suffer and our ability to generate revenue could be severely impacted.

Our licensors and we have sought, and we intend to continue to seek to protect our proprietary position by filing patent applications in the United States and, in at least some cases, one or more countries outside the United States related to current and future product candidates that are important to our business. However, we cannot predict whether the patent applications we and our licensors are currently pursuing will issue as patents, whether the claims of any issued patents will provide us with a competitive advantage, or whether we will be able to successfully pursue patent applications in the future related to our current or future product

candidates. While we have in-licensed patents and patent applications relevant to AVR-RD-03, we currently have no owned or in-licensed patents or patent applications covering AVR-RD-01, AVR-RD-02 or AVR-RD-06, and the patent applications that we in-licensed related to AVR-RD-04 and AVR-RD-05 are at a very early stage. Many of our product candidates are in-licensed from third parties. Accordingly, in some cases, the availability and scope of potential patent protection is limited based on prior decisions by our licensors or the inventors, such as decisions on when to file patent applications or whether to file patent applications at all.

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

Filing, prosecuting and defending patents on product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States could be less extensive than those in the United States. Although our license agreements grant us worldwide rights, and our currently in-licensed U.S. patent rights have certain corresponding foreign patents or patent applications, there can be no assurance that we will obtain or maintain such corresponding patents or patent applications with respect to any future license agreements. 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 even in jurisdictions where we and our licensors pursue patent protection. Consequently, we and our licensors may not be able to prevent third parties from practicing our inventions in all countries outside the United States, even in jurisdictions where we and our licensors pursue patent protection, 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 and our licensors have not pursued and obtained 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 product candidates and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets and other intellectual property protection, particularly those relating to biotechnology products, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. Proceedings to enforce our patent rights, even if obtained, in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

Issued patents covering our product candidates could be found invalid or unenforceable if challenged in court. We may not be able to protect our trade secrets in court.

If one of our licensing partners or we initiate legal proceedings against a third-party to enforce a patent covering one of our product candidates, should such a patent issue, the defendant could counterclaim that the patent covering our product candidate is invalid or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, written description or non-enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld information material to patentability from the USPTO, or made a misleading statement, during prosecution. Third parties also may 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, *inter partes* review and equivalent proceedings in foreign jurisdictions. Such proceedings could result in the revocation or cancellation of or amendment to our patents in such a way that they no longer cover our product candidates. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art, of which the patent examiner and we or our licensing partners were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity or unenforceability, we could lose at least part, and perhaps all, of the patent protection on one or more of our product candidates. Such a loss of patent protection could have a material adverse impact on our business.

In addition to the protection afforded by patents, we rely on trade secret protection and confidentiality agreements to protect proprietary know-how that is not patentable or that we elect not to patent, processes for which patents are difficult to enforce and any other elements of our product candidate discovery and development processes that involve proprietary know-how, information or technology that is not covered by patents. However, trade secrets can be difficult to protect and some courts inside and outside the United States are less willing or unwilling to protect trade secrets. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with our employees, consultants, scientific advisors and contractors. We cannot guarantee that we have entered into such agreements with each party that may have or have had access to our trade secrets or proprietary technology and processes. We also seek to preserve the integrity and confidentiality of our data and trade secrets by

maintaining physical security of our premises and physical and electronic security of our information technology systems. While we have confidence in these individuals, organizations and systems, agreements or security measures may be breached, and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors.

We may be subject to claims asserting that our employees, consultants or advisors have wrongfully used or disclosed alleged trade secrets of their current or former employers or claims asserting ownership of what we regard as our own intellectual property.

Certain of our employees, consultants or advisors are currently, or were previously, employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees, consultants and advisors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that these individuals or we have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such individual's current or former employer. Litigation may be necessary to defend against these claims. If we fail in 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 defending against such claims, litigation could result in substantial costs and be a distraction to management. Our licensors may face similar risks, which could have an adverse impact on intellectual property that is licensed to us.

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

We may be subject to claims challenging the inventorship or ownership of the patents and other intellectual property that we own or license.

We or our licensors may be subject to claims that former employees, collaborators or other third parties have an ownership interest in the patents and intellectual property that we own or license or that we may own or license in the future. While it is our policy to require our employees 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 licensors may face similar obstacles. We could be subject to ownership disputes arising, for example, from conflicting obligations of consultants or others who are involved in developing our product candidates. Litigation may be necessary to defend against any claims challenging inventorship or ownership. If we or our licensors fail in defending any such claims, we may have to pay monetary damages and may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, intellectual property, which could adversely impact our business, results of operations and financial condition.

Some intellectual property which we have in-licensed may have been discovered through government funded programs and thus may be subject to federal regulations such as "march-in" rights, certain reporting requirements, and a preference for U.S. industry. Compliance with such regulations may limit our exclusive rights, and limit our ability to contract with non-U.S. manufacturers.

Some of the intellectual property rights we have licensed, including rights licensed to us by GenStem, may have been generated through the use of U.S. government and California state funding and may therefore be subject to certain federal and state laws and regulations. For example, with respect to the AVR-RD-04 program for cystinosis, the NIH previously granted funding to UCSD for certain research in connection with the development of UCSD's gene therapy program for cystinosis, which we have licensed from GenStem. As a result, the U.S. government may have certain rights to intellectual property embodied in our AVR-RD-04 program, or in other product candidates to the extent funded by the U.S. government pursuant to the Bayh-Dole Act of 1980, or Bayh-Dole Act. These U.S. government rights in certain inventions developed under a government-funded program include a non-exclusive, non-transferable, irrevocable worldwide license to use inventions for any governmental purpose. In addition, the U.S. government has the right to require us to grant exclusive, partially exclusive, or non-exclusive licenses to any of these inventions to a third party if it determines that: (i) adequate steps have not been taken to commercialize the invention; (ii) government action is necessary to meet public health or safety needs; or (iii) government action is necessary to meet requirements for public use under federal regulations (also referred to as "march-in rights"). The U.S. government also has the right to take title to these inventions if we, or the applicable licensor, fail to disclose the invention to the government and fail to file an application to register the intellectual property within specified time limits. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require us or the applicable licensor to expend substantial resources. In addition, the U.S.

government requires that any products embodying the subject invention or produced through the use of the subject invention be manufactured substantially in the United States. The manufacturing preference requirement can be waived if the owner of the intellectual property can show that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. This preference for U.S. manufacturers may limit our ability to contract with non-U.S. product manufacturers for products covered by such intellectual property. To the extent any of our current or future intellectual property is generated through the use of U.S. government funding, the provisions of the Bayh-Dole Act may similarly apply. Any exercise by the government of certain of its rights could harm our competitive position, business, financial condition, results of operations and prospects. With respect to state funding, specifically funding via the California Institute of Regenerative Medicine, or CIRM, which has granted funds for the study of AVR-RD-04 for cystinosis, the grantee has certain obligations and the state or CIRM has certain rights. For example, the grantee has an obligation to share intellectual property, including research results, generated by CIRM-funded research, for research use in California.

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

Changes in either the patent laws or the interpretation of the patent laws in the United States could increase the uncertainties and costs surrounding the prosecution of patent applications and the enforcement or defense of 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 several significant changes to U.S. patent law. These include provisions that affect the way patent applications are prosecuted and also may affect patent litigation. These also include provisions that switched the United States from a “first-to-invent” system to a “first-to-file” system, allow third-party submission of prior art to the USPTO during patent prosecution and set forth additional procedures to attack the validity of a patent by the USPTO administered post grant proceedings. Under a first-to-file system, assuming the other requirements for patentability are met, the first inventor to file a patent application generally will be entitled to the patent on an invention regardless of whether another inventor had made the invention earlier. 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, and in particular, the first to file provisions, only became effective on March 16, 2013. Accordingly, 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, financial condition, results of operations and prospects.

The patent positions of companies engaged in the development and commercialization of biologics and pharmaceuticals are particularly uncertain. Two cases involving diagnostic method claims and “gene patents” were decided this year by the Supreme Court of the United States, or Supreme Court. On March 20, 2012, the Supreme Court issued a decision in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, or *Prometheus*, a case involving patent claims directed to a process of measuring a metabolic product in a patient to optimize a drug dosage for the patient. According to the Supreme Court, the addition of well-understood, routine or conventional activity such as “administering” or “determining” steps was not enough to transform an otherwise patent-ineligible natural phenomenon into patent-eligible subject matter. On July 3, 2012, the USPTO issued a guidance memo to patent examiners indicating that process claims directed to a law of nature, a natural phenomenon or a naturally occurring relation or correlation that do not include additional elements or steps that integrate the natural principle into the claimed invention such that the natural principle is practically applied and the claim amounts to significantly more than the natural principle itself should be rejected as directed to not patent-eligible subject matter. On June 13, 2013, the Supreme Court issued its decision in *Association for Molecular Pathology v. Myriad Genetics, Inc.*, or *Myriad*, a case involving patent claims held by Myriad Genetics, Inc. relating to the breast cancer susceptibility genes BRCA1 and BRCA2. Myriad held that an isolated segment of naturally occurring DNA, such as the DNA constituting the BRCA1 and BRCA2 genes, is not patent-eligible subject matter, but that complementary DNA, which is an artificial construct that may be created from RNA transcripts of genes, may be patent-eligible. On March 4, 2014, the USPTO issued a guidance memorandum to patent examiners entitled 2014 Procedure For Subject Matter Eligibility Analysis Of Claims Reciting Or Involving Laws Of Nature/Natural Principles, Natural Phenomena, And/Or Natural Products. These guidelines instruct USPTO examiners on the ramifications of the *Prometheus* and *Myriad* rulings and apply the *Myriad* ruling to natural products and principles including all naturally occurring nucleic acids.

Certain claims of our licensed patents and patent applications contain, and any future patents we may obtain may contain, claims that relate to specific recombinant DNA sequences that are naturally occurring at least in part and, therefore, could be the subject of future challenges made by third parties. In addition, the 2014 USPTO guidance could impact our ability to pursue similar patent claims in patent applications we may prosecute in the future.

We cannot assure you that our efforts to seek patent protection for our product candidates will not be negatively impacted by the decisions described above, rulings in other cases or changes in guidance or procedures issued by the USPTO. We cannot fully predict what impact the Supreme Court’s decisions in *Prometheus* and *Myriad* may have on the ability of life science companies to obtain or

enforce patents relating to their products in the future. These decisions, the guidance issued by the USPTO and rulings in other cases or changes in USPTO guidance or procedures could have a material adverse effect on our existing patent rights and our ability to protect and enforce our intellectual property in the future.

Moreover, although the Supreme Court has held in *Myriad* that isolated segments of naturally occurring DNA are not patent-eligible subject matter, certain third parties could allege that activities that we may undertake infringe other gene-related patent claims, and we may deem it necessary to defend ourselves against these claims by asserting non-infringement and/or invalidity positions, or paying to obtain a license to these claims. In any of the foregoing or in other situations involving third-party intellectual property rights, if we are unsuccessful in defending against claims of patent infringement, we could be forced to pay damages or be subjected to an injunction that would prevent us from utilizing the patented subject matter. Such outcomes could harm our business, financial condition, results of operations or prospects.

If we do not obtain patent term extension and data exclusivity for our product candidates, our business may be materially harmed.

Depending upon the timing, duration and specifics of any FDA marketing approval of our product candidates, one or more U.S. patents that we license or may own or license in the future, if any, may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, or Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit a patent extension term of up to five years as compensation for patent term lost during the FDA regulatory review process. A patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval, only one patent may be extended and only those claims covering the approved drug, a method for using it or a method for manufacturing it may be extended. A patent may only be extended once and only based on a single approved product. However, we may not be granted an extension because of, for example, failing to exercise due diligence during the testing phase or regulatory review process, failing to apply within applicable deadlines, failing to apply prior to expiration of relevant patents or otherwise failing to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than we request. If we are unable to obtain patent term extension or the term of any such extension is less than we request, our competitors may obtain approval of competing products following our patent expiration, and our revenue could be reduced, possibly materially. In addition, we do not control the efforts of our licensors to obtain a patent term extension, and there can be no assurance that they will pursue or obtain such extensions to the patents that we license from them.

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.

We have registered the marks “AVROBIO” and “plato” with the USPTO but do not have trademarks or trademark applications with the USPTO for the marks “AVRO” or the AVROBIO logo. In the future, even if we apply for registration of these marks, there can be no assurance that such registration will be approved. Once registered, our 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 partners 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.

Intellectual property rights and regulatory exclusivity rights do not necessarily address all potential threats.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations, and may not adequately protect our business or permit us to maintain our competitive advantage. For example:

- others may be able to make gene therapy products that are similar to our product candidates but that are not covered by the claims of the patents that we license or may own or license in the future;
- we, our license partners or current or future collaborators, might not have been the first to make the inventions covered by the issued patents or pending patent applications that we license or may own or license in the future;
- we, our license partners or current or future collaborators, might not have been the first to file patent applications covering certain of our or their inventions;

- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our owned or licensed intellectual property rights;
- it is possible that our pending licensed patent applications or those that we may own or license in the future will not lead to issued patents;
- issued patents that we hold rights to or may hold rights to in the future may be held invalid or unenforceable, including as a result of legal challenges by our competitors;
- one or more of our product candidates may never be protected by patents;
- our competitors might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable;
- the patents of others may have an adverse effect on our business; and
- we may choose not to file a patent application for certain trade secrets or know-how, and a third party may subsequently file a patent application or obtain a patent covering such intellectual property.

Should any of these events occur, they could significantly harm our business, financial condition, results of operations and prospects.

Risks related to ownership of our common stock

The market price of our common stock may be highly volatile, and you may not be able to resell your shares at or above the price at which you purchased our shares.

Our stock price is likely to be volatile. Since our initial public offering, or IPO, in June 2018, through October 29, 2021, the trading price of our common stock has ranged from \$5.23 to \$53.70. The stock market in general, and the market for biopharmaceutical companies in particular, has experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, you may not be able to sell your common stock at or above the price at which you purchased shares. The market price for our common stock may be influenced by many factors, including:

- the ongoing COVID-19 pandemic;
- adverse results or delays in ongoing or planned preclinical studies or clinical trials;
- reports of adverse events in other gene therapy products or clinical studies of such products;
- an inability to obtain additional funding;
- failure by us to comply with the terms of our Term Loan Agreement;
- failure by us to successfully develop and commercialize our product candidates;
- failure by us to maintain our existing strategic collaborations or enter into new collaborations;
- failure by us or our licensors and strategic partners to prosecute, maintain or enforce our intellectual property rights;
- changes in laws or regulations applicable to future products;
- an inability to obtain adequate product supply for our product candidates or the inability to do so at acceptable prices;
- adverse regulatory decisions;
- the introduction of new products, services or technologies by our competitors;
- failure by us to meet or exceed financial projections we may provide to the public;
- failure by us to meet or exceed the financial projections of the investment community;
- the perception of the pharmaceutical industry by the public, legislatures, regulators and the investment community;
- announcements of significant acquisitions, strategic partnerships, joint ventures or capital commitments by us, our strategic partner or our competitors;
- disputes or other developments relating to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;

- additions or departures of key scientific or management personnel;
- significant lawsuits, including patent or stockholder litigation;
- changes in the market valuations of similar companies;
- sales of our common stock by us or our stockholders in the future; and
- the trading volume of our common stock.

In addition, companies trading in the stock market in general, and The Nasdaq Global Select Market in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. Broad market and industry factors may negatively affect the market price of our common stock, regardless of our actual operating performance.

We could be subject to securities class action litigation.

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

An active trading market for our common stock may not be sustained.

Prior to our IPO in June 2018, there had been no public market for our common stock. Although our common stock is listed on The Nasdaq Global Select Market, an active trading market for our shares may never be sustained. If an active market for our common stock is not sustained, it may be difficult for you to sell shares you purchased without depressing the market price for the shares, or at all.

An inactive trading market may also impair our ability to raise capital to continue to fund operations by selling additional shares and may impair our ability to acquire other companies or technologies by using our shares as consideration.

If securities or industry analysts do not publish research or publish inaccurate or unfavorable research about our business, our share price and trading volume could decline.

The trading market for our common stock will likely depend in part on the research and reports that securities or industry analysts publish about us or our business. We do not have any control over these analysts. Although we have obtained research coverage from certain analysts, there can be no assurance that analysts will continue to cover us or provide favorable coverage. If one or more analysts downgrade our stock or change their opinion of our stock, our share price would likely decline. In addition, if one or more analysts cease coverage of our company or fail to regularly publish reports on us, we could lose visibility in the financial markets, which could cause our share price or trading volume to decline.

Concentration of ownership of our common stock among our existing executive officers, directors and principal stockholders may prevent new investors from influencing significant corporate decisions.

Based on shares outstanding as of October 29, 2021, our executive officers, directors, five percent stockholders and their affiliates beneficially owned approximately 45% of our voting stock. As a result, if these stockholders were to act together, they would be able to significantly influence all matters submitted to our stockholders for approval, as well as our management and affairs. For example, these stockholders, acting together, may be able to influence elections of directors, amendments of our organizational documents, or approval of any merger, sale of assets, or other major corporate transaction. This may prevent or discourage unsolicited acquisition proposals or offers for our common stock that you may believe are in your best interest as one of our stockholders. Some of these persons or entities may have interests different than yours. For example, because many of these stockholders purchased their shares at prices substantially below the current trading price of our stock and have held their shares for a longer period, they may be more interested in selling our Company to an acquirer than other investors or they may want us to pursue strategies that deviate from the interests of other stockholders.

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

We are an “emerging growth company,” or EGC, as defined in the JOBS Act. We will remain an EGC until the earliest of: (i) the last day of the fiscal year in which we have total annual gross revenues of \$1.07 billion or more; (ii) the last day of the fiscal year following the fifth anniversary of the date of the completion of our IPO; (iii) the date on which we have issued more than \$1.0 billion in nonconvertible debt during the previous three years; or (iv) the date on which we are deemed to be a large accelerated filer under the rules of the SEC, which means the first day of the year following the first year in which the market value of our common stock that is held by non-affiliates exceeds \$700 million as of June 30 in any given year. For so long as we remain an EGC, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, or Section 404;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor’s report providing additional information about the audit and the financial statements;
- being permitted to provide only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced “Management’s discussion and analysis of financial condition and results of operations” disclosure;
- reduced disclosure obligations regarding executive compensation; and
- an exemption from the requirement to seek nonbinding advisory votes on executive compensation or golden parachute arrangements.

We may choose to take advantage of some, but not all, of the available exemptions. We have taken advantage of reduced reporting burdens in this Annual Report on Form 10-K. In particular, we have not included in this Annual Report, and do not intend to include in our 2021 Proxy Statement, all of the executive compensation information that would be required if we were not an EGC. We cannot predict whether investors will find our common stock less attractive if we rely on certain or all of these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

In addition, the JOBS Act provides that an EGC may take advantage of an extended transition period for complying with new or revised accounting standards. This allows an EGC to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have elected to avail ourselves of this exemption from new or revised accounting standards and, therefore, we will not be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

Even after we no longer qualify as an emerging growth company, we may still qualify as a “smaller reporting company” if the market value of our common stock held by non-affiliates is below \$250 million (or \$700 million if our annual revenue is less than \$100 million) as of June 30 in any given year, which would allow us to take advantage of many of the same exemptions from disclosure requirements.

We expect to continue to incur increased costs as a result of operating as a public company, and our management is required to devote substantial time to new compliance initiatives.

As a public company, and particularly after we are no longer an EGC, we will incur significant legal, accounting and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act of 2002 and rules subsequently implemented by the SEC and Nasdaq have imposed various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel will continue to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations have increased our legal and financial compliance costs and will continue to make some activities more time-consuming and costly. For example, we expect that these rules and regulations may make it more difficult and increasingly more expensive for us to obtain and maintain director and officer liability insurance.

Pursuant to Section 404, we are required to furnish a report by our management on our internal control over financial reporting, and, once we are no longer an EGC or a “smaller reporting company,” we will be required to furnish an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. To achieve compliance with Section 404, we continue to be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. In this regard, we will need to continue to dedicate internal resources, potentially continue to engage outside consultants and adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to improve control processes as appropriate, validate through testing that controls are functioning as documented and implement a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that we will not be able to conclude that our internal control over financial reporting is effective as required by Section 404. This could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements.

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, are 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. In addition, any testing by us conducted in connection with Section 404, or any subsequent testing by our independent registered public accounting firm, may reveal deficiencies in our internal control over financial reporting that are deemed to be material weaknesses or that may require prospective or retroactive changes to our financial statements, or may identify other areas for further attention or improvement. Inferior internal controls could also cause investors to lose confidence in our reported financial information, which could have a negative effect on the trading price of our stock.

We are required to disclose changes made in our internal controls and procedures on a quarterly basis and our management is required to assess the effectiveness of these controls annually. However, for as long as we are an EGC or a “smaller reporting company,” our independent registered public accounting firm will not be required to attest to the effectiveness of our internal control over financial reporting pursuant to Section 404. We could be an EGC for up to five years following the completion of our IPO and will qualify as a “smaller reporting company” if the market value of our common stock held by non-affiliates is below \$250 million (or \$700 million if our annual revenue is less than \$100 million) as of June 30 in any given year. An independent assessment of the effectiveness of our internal control over financial reporting could detect problems that our management’s assessment might not. Undetected material weaknesses in our internal control over financial reporting could lead to financial statement restatements and require us to incur the expense of remediation.

If we experience material weaknesses or deficiencies in the future, or otherwise fail to establish and maintain effective internal controls, we may be unable to produce timely and accurate financial statements, and we may conclude that our internal control over financial reporting is not effective, which could adversely impact our investors’ confidence and our stock price.

We expect to continue our efforts to improve our control processes, though there can be no assurance that our efforts will ultimately be successful or avoid potential future material weaknesses, and we expect to continue incurring additional costs as a result of these efforts. If we are unable to successfully remediate any future material weaknesses in our internal control over financial reporting, the accuracy and timing of our financial reporting may be adversely affected, we may be unable to maintain compliance with securities law requirements regarding timely filing of periodic reports in addition to applicable stock exchange listing requirements, investors may lose confidence in our financial reporting, and our stock price may decline as a result. We also could become subject to investigations by Nasdaq, the SEC or other regulatory authorities.

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

Our disclosure controls and procedures are designed to reasonably assure that information required to be disclosed by us in reports we file or submit under the Exchange Act is accumulated and communicated to management, recorded, processed, summarized and reported within the time periods specified in the rules and forms of the SEC. We believe that any disclosure controls and procedures or internal controls and procedures, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by an unauthorized override of the controls.

Accordingly, because of the inherent limitations in our control system, misstatements or insufficient disclosures due to error or fraud may occur and not be detected.

A significant portion of our total outstanding shares are restricted from immediate resale but may be sold into the market in the near future, which could cause the market price of our common stock to drop significantly.

Sales of a substantial number of shares of our common stock in the public market could occur at any time, subject to certain restrictions described below. These sales, or the perception in the market that holders of a large number of shares intend to sell shares, could reduce the market price of our common stock. As of October 29, 2021, holders of an aggregate of approximately 4.5 million shares of our common stock will have rights, subject to certain conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders. In addition, shares reserved for issuance upon the exercise of stock options outstanding under our equity incentive plans will become eligible for sale in the public market in the future. We have registered all shares of common stock that we may issue under our equity compensation plans, which can be freely sold in the public market upon issuance, subject to volume limitations applicable to affiliates.

We do not intend to pay dividends on our common stock, so any returns will be limited to the value of our stock.

We have never declared or paid any cash dividends on our common stock. We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. Any return to stockholders will therefore be limited to the appreciation of their stock. For example, our Term Loan Agreement restricts our ability to pay certain kinds of dividends or to make certain kinds of distributions on account of our capital stock, and we may enter into agreements in the future with similar restrictions. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future.

Provisions in our amended and restated certificate of incorporation and by-laws, as well as provisions of Delaware law, could make it more difficult for a third party to acquire us or increase the cost of acquiring us, even if doing so would benefit our stockholders or remove our current management.

Our amended and restated certificate of incorporation, amended and restated by-laws and Delaware law contain provisions that may have the effect of delaying or preventing a change in control of us or changes in our management. Our amended and restated certificate of incorporation and by-laws, include provisions that:

- authorize “blank check” preferred stock, which could be issued by our board of directors without stockholder approval and may contain voting, liquidation, dividend and other rights superior to our common stock;
- create a classified board of directors whose members serve staggered three-year terms;
- specify that special meetings of our stockholders can be called only by our board of directors, the chairperson of our board of directors, our chief executive officer or our president;
- prohibit stockholder action by written consent;
- establish an advance notice procedure for stockholder approvals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to our board of directors;
- provide that our directors may be removed only for cause;
- provide that vacancies on our board of directors may be filled only by a majority of directors then in office, even though less than a quorum;
- specify that no stockholder is permitted to cumulate votes at any election of directors;
- expressly authorize our board of directors to modify, alter or repeal our amended and restated by-laws; and require supermajority votes of the holders of our common stock to amend specified provisions of our amended and restated certificate of incorporation and amended and restated by-laws.

These provisions, alone or together, could delay or prevent hostile takeovers and changes in control or changes in our management.

In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which limits the ability of stockholders owning in excess of 15% of our outstanding voting stock to merge or combine with us.

Any provision of our amended and restated certificate of incorporation or amended and restated by-laws or Delaware law that has the effect of delaying or deterring a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our common stock, and could also affect the price that some investors are willing to pay for our common stock.

Our bylaws contain exclusive forum provisions, which may limit a stockholder's ability to bring a claim in a judicial forum it finds favorable and may discourage lawsuits with respect to such claims.

Our amended and restated bylaws provide that, unless we consent in writing to an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for any state law claim for (1) any derivative action or proceeding brought on our behalf; (2) any action asserting a claim of breach of or based on a fiduciary duty owed by any of our current or former directors, officers or other employees to us or our stockholders; (3) any action asserting a claim against us or any of our current or former directors, officers, employees or stockholders arising pursuant to any provision of the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws; or (4) any action asserting a claim governed by the internal affairs doctrine, or the Delaware Forum Provision. The Delaware Forum Provision will not apply to any causes of action arising under the Securities Act or the Exchange Act. Our amended and restated bylaws further provide that, unless we consent in writing to an alternative forum, the United States District Court for the District of Massachusetts will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act, or the Federal Forum Provision, as our principal executive offices are located in Cambridge, Massachusetts. In addition, our amended and restated bylaws provide that any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock is deemed to have notice of and consented to the foregoing Delaware Forum Provision and the Federal Forum Provision; provided, however, that stockholders cannot and will not be deemed to have waived our compliance with the U.S. federal securities laws and the rules and regulations thereunder.

We recognize that the Delaware Forum Provision and the Federal Forum Provision may impose additional litigation costs on stockholders who assert the provision is not enforceable and may impose more general additional litigation costs in pursuing any such claims, particularly if the stockholders do not reside in or near the State of Delaware or the Commonwealth of Massachusetts. Additionally, these forum selection clauses in our amended and restated bylaws may limit our stockholders' ability to bring a claim in a judicial forum that they find favorable for disputes with us or our directors, officers or employees, which may discourage such lawsuits against us and our directors, officers and employees even though an action, if successful, might benefit our stockholders. Section 22 of the Securities Act creates a concurrent jurisdiction for state and federal courts over all suits brought concerning a duty or liability created by the securities laws, rules and regulations thereunder. While the Delaware Supreme Court ruled in March 2020 that federal forum selection provisions purporting to require claims under the Securities Act be brought in federal court are "facially valid" under Delaware law, there is uncertainty as to whether other courts will enforce our Federal Forum Provision. The Federal Forum Provision may also impose additional litigation costs on stockholders who assert the provision is unenforceable, and if the Federal Forum Provision is found to be unenforceable, we may incur additional costs with resolving such matters. The Court of Chancery of the State of Delaware and the United States District Court for the District of Massachusetts may also reach different judgments or results than would other courts, including courts where a stockholder considering an action may be located or would otherwise choose to bring the action, and such judgments may be more or less favorable to us than our stockholders.

General Risk Factors

Unfavorable global economic conditions could adversely affect our business, financial condition or results of operations.

Our results of operations could be adversely affected by general conditions in the global economy and in the global financial markets. The COVID-19 pandemic has caused extreme volatility and disruptions in the capital and credit markets. A severe or prolonged economic downturn could result in a variety of risks to our business, including weakened demand for our product candidates and our ability to raise additional capital when needed on acceptable terms, if at all. A weak or declining economy could also strain our suppliers, possibly resulting in supply disruption, or cause delays in payments for our services by third-party payors or our collaborators. Any of the foregoing could harm our business and we cannot anticipate all of the ways in which the current economic climate and financial market conditions could adversely impact our business, financial condition, results of operations and prospects.

We or the third parties upon whom we depend may be adversely affected by earthquakes or other natural disasters and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Earthquakes or other natural disasters could severely disrupt our operations, and have a material adverse effect on our business, results of operations, financial condition and prospects. If a natural disaster, power outage or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure, such as the manufacturing facilities of our third-party contract manufacturers, or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place currently are limited and are unlikely to prove adequate in the event of a serious disaster or similar event. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which, particularly when taken together with our lack of earthquake insurance, could have a material adverse effect on our business, financial condition, results of operations and prospects.

Our internal computer systems, or those of our collaborators or other contractors or consultants, may fail or suffer security breaches, which could result in a material disruption of our product development programs.

Despite our security measures, our internal computer systems and those of our current and any future collaborators and other contractors or consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. For example, in 2017 we were subjected to a cyberattack by a third party, which led to the theft of a portion of our funds. We implemented remedial measures promptly following this breach and do not believe that this breach had a material adverse effect on our business. In addition, in February 2019, one of our vendors was subject to a cyberattack by a third party, which resulted in the payment by us of a fraudulent invoice. We have implemented remedial measures following this breach and do not believe that this breach had a material effect on our business. However, if any cyberattack or data breach were to occur in the future and cause interruptions in our or our collaborators', contractors' or consultants' operations, it could result in a material disruption of our development programs and our business operations, whether due to a loss of our business data, trade secrets or other proprietary information or other similar disruptions. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability, our competitive position could be harmed and the further development and commercialization of our product candidates could be delayed.

Changes in tax law could adversely affect our business and financial condition.

The rules dealing with U.S. federal, state, and local income taxation are constantly under review by persons involved in the legislative process and by the Internal Revenue Service and the U.S. Treasury Department. Changes to tax laws (which changes may have retroactive application) could adversely affect us or holders of our common stock. In recent years, many such changes have been made and changes are likely to continue to occur in the future. Future changes in tax laws could have a material adverse effect on our business, cash flow, financial condition or results of operations. We urge investors to consult with their legal and tax advisers regarding the implications of potential changes in tax laws on an investment in our common stock.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds.

Not applicable.

Item 3. Defaults Upon Senior Securities.

Not applicable.

Item 4. Mine Safety Disclosures.

Not applicable.

Item 5. Other Information.

Term Loan Agreement

On November 2, 2021, or the Closing Date, we entered into a Loan and Security Agreement, or the Term Loan Agreement, by and among the Company, the lenders party thereto from time to time, or the Lenders, and Silicon Valley Bank, as administrative agent and collateral agent for the Lenders, or the Agent. The Term Loan Agreement provides for (i) on the Closing Date, \$30.0 million aggregate principal amount of term loans available through October 31, 2023; (ii) an additional \$10.0 million term loan facility available through October 31, 2023 upon the achievement of certain regulatory milestones prior to the time of draw; (iii) an additional \$10.0 million term loan facility available through October 31, 2023 upon the achievement of certain regulatory and/or clinical milestones prior to the time of draw; and (iv) an additional discretionary \$15.0 million term loan facility available upon our request and approval by the Agent and the Lenders, or, collectively, the Term Loans. The Company drew \$15.0 million in term loans on the Closing Date.

The obligations under the Term Loan Agreement are secured by a perfected security interest in all of the Company's assets except for intellectual property pursuant to the terms of the Term Loan Agreement.

The interest rate applicable to the Term Loans is the greater of (a) the WSJ Prime Rate plus 4.85% or (b) 8.10% per annum. The Term Loans are interest only from the Closing Date through November 1, 2024, after which the Company is required to pay equal monthly installments of principal and accrued interest through October 1, 2026, the maturity date.

The Term Loans may be prepaid in full through November 2, 2022 with payment of a 1.50% prepayment premium, after which they may be prepaid in full through November 2, 2023 with payment of a 1.00% prepayment premium, after which they may be prepaid in full with no prepayment premium. An additional final payment of 9.00% of the amount of Terms Loans advanced by the Lenders will be due upon prepayment or repayment of the Term Loans in full.

The Term Loan Agreement contains customary representations and warranties and customary affirmative and negative covenants, including, among other things, restrictions on indebtedness, liens, investments, mergers, dispositions, prepayment of other indebtedness and dividends and other distributions.

The Term Loan Agreement also includes customary events of default, including failure to pay principal, interest or certain other amounts when due, material inaccuracy of representations and warranties, violation of covenants, specified cross-default and cross-acceleration to other material indebtedness, certain bankruptcy and insolvency events, certain undischarged judgments, material invalidity of guarantees or grant of security interest, material adverse change, involuntary delisting from Nasdaq and change of control, in certain cases subject to certain thresholds and grace periods. If one or more events of default occurs and continues beyond any applicable cure period, the Agent may, with the consent of the Lenders holding a majority of the loans and commitments under the facilities, or will, at the request of such Lenders, terminate the commitments of the Lenders to make further loans and declare all of the obligations of the Company under the Term Loan Agreement to be immediately due and payable.

The foregoing description of the Term Loan Agreement is not intended to be complete and is qualified in its entirety by reference to the Term Loan Agreement, a copy of which is filed as Exhibit 10.1 to this Quarterly Report on Form 10-Q.

Item 6. Exhibits.

<u>Exhibit Number</u>	<u>Description</u>
3.1	<u>Fourth Amended and Restated Certificate of Incorporation of the Registrant (filed as Exhibit 3.1 to our Current Report on Form 8-K filed on JUNE 25, 2018 and incorporated herein by reference).</u>
3.2	<u>Certificate of Change of Registered Agent and/or Registered Office of the Registrant (filed as Exhibit 3.2 to our Quarterly Report on Form 10-Q filed on November 5, 2020 (File No. 001-38537) and incorporated herein by reference).</u>
3.3	<u>Amended and Restated By-laws of the Registrant (filed as Exhibit 3.2 to our Current Report on Form 8-K filed on June 25, 2018 and incorporated herein by reference).</u>
10.1	<u>Loan and Security Agreement, dated November 2, 2021, by and among the Registrant, the lenders party thereto from time to time and Silicon Valley Bank, as administrative agent and collateral agent.</u>
31.1	<u>Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.</u>
31.2	<u>Certification of Principal Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.</u>
32.1*	<u>Certification of Principal Executive Officer and Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.</u>
101.INS	Interactive Data Files pursuant to Rule 405 of Regulation S-T formatted in Inline Extensible Business Reporting Language (“Inline XBRL”).
101.SCH	Inline XBRL Taxonomy Extension Schema Document.
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document.
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document.
104	Cover Page Interactive Data File (formatted as inline XBRL with applicable taxonomy extension information contained in Exhibits 101.*).

* Indicates the exhibit is being furnished, not filed, with this report.

SIGNATURES

Pursuant to the requirements 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.

AVROBIO, INC.

Date: November 4, 2021

By: _____ /s/ Geoff MacKay
Geoff MacKay
President, Chief Executive Officer, and Principal Executive Officer

Date: November 4, 2021

By: _____ /s/ Erik Ostrowski
Erik Ostrowski
Chief Financial Officer and Principal Financial and Accounting Officer

LOAN AND SECURITY AGREEMENT

This **LOAN AND SECURITY AGREEMENT** (this “**Agreement**”) is dated as of the Effective Date among (a) **SILICON VALLEY BANK**, a California corporation (“**SVB**”), in its capacity as administrative agent and collateral agent (“**Agent**”), (b) **SVB**, as a lender, (c) **SVB INNOVATION CREDIT FUND VIII, L.P.**, a Delaware limited partnership (“**SVB Capital**”), as a lender (SVB and SVB Capital and each of the other “**Lenders**” from time to time a party hereto are referred to herein collectively as the “**Lenders**” and each individually as a “**Lender**”), and (d) the borrower listed on Schedule I hereto (“**Borrower**”). The parties agree as follows:

1 LOAN AND TERMS OF PAYMENT**1.1 Term Loan Advances.**

(a) Availability. Subject to the terms and conditions of this Agreement, upon Borrower’s request, Lenders agree to make term loan advances available to Borrower from time to time in three (3) tranches: “**Tranche A**”, “**Tranche B**”, and “**Tranche C**”. Subject to the terms and conditions of this Agreement, on or about the Effective Date, the Lenders, severally and not jointly, shall make one (1) term loan advance to Borrower in an original principal amount equal to Fifteen Million Dollars (\$15,000,000) according to each Lender’s Initial Tranche A Term Loan Advance Commitment as set forth on Schedule II hereto (the “**Initial Tranche A Term Loan Advance**”). Thereafter, subject to the terms and conditions of this Agreement, upon Borrower’s request, during the Tranche A Draw Period, the Lenders, severally and not jointly, shall make one (1) additional term loan advance to Borrower in an original principal amount of Fifteen Million Dollars (\$15,000,000) according to each Lender’s Subsequent Tranche A Term Loan Advance Commitment as set forth on Schedule II hereto (the “**Subsequent Tranche A Term Loan Advance**” and together with the Initial Tranche A Term Loan Advance, the “**Tranche A Term Loan Advances**”). Subject to the terms and conditions of this Agreement, upon Borrower’s request, during the Tranche B Draw Period, if Borrower can satisfy the Tranche B Draw Condition on the date of its request for a term loan advance (and the applicable Funding Date), the Lenders, severally and not jointly, shall make one (1) term loan advance to Borrower in an original principal amount of Ten Million Dollars (\$10,000,000) according to each Lender’s Tranche B Term Loan Advance Commitment as set forth on Schedule II hereto (the “**Tranche B Term Loan Advance**”). Subject to the terms and conditions of this Agreement, upon Borrower’s request, during the Tranche C Draw Period, if Borrower can satisfy the Tranche C Draw Conditions on the date of its request for a term loan advance (and the applicable Funding Date), the Lenders, severally and not jointly, shall make one (1) term loan advance to Borrower in an original principal amount of Ten Million Dollars (\$10,000,000) according to each Lender’s Tranche C Term Loan Advance Commitment as set forth on Schedule II hereto (the “**Tranche C Term Loan Advance**”). The Tranche A Term Loan Advances, Tranche B Term Loan Advance, and Tranche C Term Loan Advance are hereinafter referred to singly as a “**Term Loan Advance**” and collectively as the “**Term Loan Advances**”. Borrower may request Term Loan Advances as set forth on Schedule I hereto. The aggregate principal amount of the Term Loan Advances made by the Lenders to Borrower shall not, at any time, exceed the Term Loan Availability Amount. After repayment, no Term Loan Advance (or any portion thereof) may be reborrowed.

Additionally, at any time during the term of this Agreement, Borrower may request that the Lenders make additional term loan advances available to Borrower in an aggregate original principal amount not to exceed Fifteen Million Dollars (\$15,000,000) (the “**Uncommitted Accordion**”). Lenders, in their sole and absolute discretion, may grant or deny any such request from Borrower for a term loan advance under the Uncommitted Accordion. If, and only if, the Lenders, in their sole discretion, agree to provide any additional term loan advance(s) to Borrower under the Uncommitted Accordion, (i) the Lenders shall make such term loan advance to Borrower according to each Lender’s Uncommitted Accordion Commitment as set forth on Schedule II hereto, and (ii) the term loan advances shall each be considered a “**Term Loan Advance**” hereunder and added to the definition thereof; provided that the terms of the making of any advance under the Uncommitted Accordion shall be outlined in an amendment to this Agreement to be entered into by the parties hereto.

(b) Repayment. Borrower shall repay the aggregate outstanding Term Loan Advances as set forth on Schedule I hereto. All outstanding principal and accrued and unpaid interest with respect to the Term Loan Advances, the Final Payment, and all other outstanding Obligations under the Term Loan Advances, are due and payable in full on the Term Loan Maturity Date.

(c) Permitted Prepayment. Borrower shall have the option to prepay all, but not less than all, of the Term Loan Advances advanced by the Lenders under this Agreement, provided Borrower (i) provides written notice to Agent of its election to prepay the Term Loan Advances at least five (5) Business Days prior to such prepayment, and (ii) pays to Agent, for the account of the Lenders in accordance with their respective Pro Rata Share, on the date of such prepayment (A) all outstanding principal plus accrued and unpaid interest, (B) the Prepayment Premium, (C) the Final Payment and (D) all other sums, if any, that shall have become due and payable hereunder, including Lenders' Expenses and interest at the Default Rate with respect to any past due amounts.

(d) Mandatory Prepayment Upon an Acceleration. If the Term Loan Advances are accelerated by Agent, following the occurrence and during the continuance of an Event of Default, Borrower shall immediately pay to Agent, for the account of the Lenders in accordance with their respective Pro Rata Share, an amount equal to the sum of (i) all outstanding principal plus accrued and unpaid interest with respect to the Term Loan Advances, (ii) the Prepayment Premium, (iii) the Final Payment and (iv) all other sums, if any, that shall have become due and payable hereunder, including Lenders' Expenses and interest at the Default Rate with respect to any past due amounts.

1.2 Payment of Interest on the Credit Extensions.

(a) Interest Payments. Interest on the principal amount of each Term Loan Advance is payable as set forth on Schedule I hereto.

(b) Interest Rate.

(i) Term Loan Advances. Subject to Section 1.2(c), the outstanding principal amount of any Term Loan Advance shall accrue interest as set forth on Schedule I hereto.

(ii) All-In Rate. Notwithstanding any terms in this Agreement to the contrary, if at any time the interest rate applicable to any Obligations is less than zero percent (0.0%), such interest rate shall be deemed to be zero percent (0.0%) for all purposes of this Agreement.

(c) Default Rate. Immediately upon the occurrence and during the continuance of an Event of Default, the outstanding Obligations shall bear interest at a rate per annum which is five percent (5.0%) above the rate that is otherwise applicable thereto (the "**Default Rate**") unless Agent otherwise elects in its sole discretion to impose a smaller increase. Fees and expenses which are required to be paid by Borrower pursuant to the Loan Documents (including, without limitation, Lenders' Expenses) but are not paid when due shall bear interest until paid at a rate equal to the highest rate applicable to the Obligations. Payment or acceptance of the increased interest rate provided in this Section 1.2(c) is not a permitted alternative to timely payment and shall not constitute a waiver of any Event of Default or otherwise prejudice or limit any rights or remedies of Agent or any Lender.

(d) Adjustment to Interest Rate. Each change in the interest rate applicable to any amounts payable under the Loan Documents based on changes to the Prime Rate shall be effective on the effective date of any change to the Prime Rate and to the extent of such change.

(e) Interest Computation. Interest shall be computed as set forth on Schedule I hereto. In computing interest, the date of the making of any Credit Extension shall be included and the date of payment shall be excluded; provided, however, that if any Credit Extension is repaid on the same day on which it is made, such day shall be included in computing interest on such Credit Extension.

1.3 Fees and Expenses. Borrower shall pay to Agent:

(a) Final Payment. The Final Payment, when due hereunder, to be shared between the Lenders pursuant to their respective Term Loan Commitment Percentages, which shall be fully earned and non-refundable as of such date;

(b) Prepayment Premium. The Prepayment Premium, when due hereunder, to be shared between the Lenders pursuant to their respective Term Loan Commitment Percentages, which shall be fully earned and non-refundable as of such date; and

(c) Lenders' Expenses. All Lenders' Expenses (including reasonable attorneys' fees and expenses for documentation and negotiation of this Agreement) incurred through and after the Effective Date, when due (or, if no stated due date, upon demand by Agent). Borrower has paid to Agent a good faith deposit of Seventy-Five Thousand Dollars (\$75,000) (the "**Good Faith Deposit**") to initiate Lenders' due diligence review process. The Good Faith Deposit will be applied to Lenders' Expenses incurred as of the Effective Date.

Unless otherwise provided in this Agreement or in a separate writing by Agent, Borrower shall not be entitled to any credit, rebate, or repayment of any fees earned by Agent or any Lender pursuant to this Agreement notwithstanding any termination of this Agreement or the suspension or termination of any Lender's obligation to make loans and advances hereunder. Agent may deduct amounts owing by Borrower under the clauses of this Section 1.3 pursuant to the terms of Section 1.4(e). Agent shall provide Borrower written notice of deductions made pursuant to the terms of the clauses of this Section 1.3.

1.4 Payments; Pro Rata Treatment; Application of Payments; Debit of Accounts.

(a) All payments (including prepayments) to be made by Borrower under any Loan Document shall be made to Agent for the account of Lenders, in immediately available funds in Dollars, without setoff, counterclaim, or deduction, before 12:00 p.m. Eastern time on the date when due. Agent shall distribute such payments to Lenders in like funds as set forth in Section 1.5. Payments of principal and/or interest received after 12:00 p.m. Eastern time are considered received at the opening of business on the next Business Day. When a payment is due on a day that is not a Business Day, the payment shall be due the next Business Day, and additional fees or interest, as applicable, shall continue to accrue until paid.

(b) Each borrowing by Borrower from Lenders hereunder shall be made according to the respective Term Loan Commitment Percentages of the relevant Lenders.

(c) Except as otherwise provided herein, each payment (including each prepayment) by Borrower on account of principal or interest on the Term Loan Advances shall be applied according to each Lender's Pro Rata Share of the outstanding principal amount of the Term Loan Advances. The amount of each principal prepayment of the Term Loan Advances shall be applied to reduce the then remaining installments of the Term Loan Advances based upon each Pro Rata Share of Term Loan Advances.

(d) Agent has the exclusive right to determine the order and manner in which all payments with respect to the Obligations may be applied. Borrower shall have no right to specify the order or the accounts to which Agent shall allocate or apply any payments required to be made by Borrower to Agent or otherwise received by Agent or any Lender under this Agreement when any such allocation or application is not specified elsewhere in this Agreement.

(e) Agent may debit any of Borrower's deposit accounts maintained with Agent, including the Designated Deposit Account, for principal and interest payments or any other amounts Borrower owes Agent or any Lender when due under the Loan Documents. These debits shall not constitute a set-off.

(f) Unless Agent shall have been notified in writing by Borrower prior to the date of any payment due to be made by Borrower hereunder that Borrower will not make such payment to Agent, Agent may assume that Borrower is making such payment, and Agent may, but shall not be required to, in reliance upon such assumption, make available to Lenders their respective Pro Rata Share of a corresponding payment amount. If such payment is not made to Agent by Borrower within three (3) Business Days after such due date, Agent shall be entitled to recover, on demand, from each Lender to which any amount which was made available pursuant to the preceding sentence, such amount with interest thereon at the rate per annum equal to the daily average Federal Funds Effective Rate. Nothing herein shall be deemed to limit the rights of Agent or any Lender against Borrower.

1.5 Settlement Procedures. If Agent receives any payment for the account of Lenders on or prior to 12:00 p.m. (Eastern time) on any Business Day, Agent shall pay to each applicable Lender such Lender's Pro Rata Share of such payment on such Business Day. If Agent receives any payment for the account of Lenders after 12:00 p.m. (Eastern time) on any Business Day, Agent shall pay to each applicable Lender such Lender's Pro Rata Share of such payment on the next Business Day.

1.6 Withholding by Borrower. Payments received by Agent, for the account of Lenders, from Borrower under this Agreement will be made free and clear of and without deduction for any and all present or future taxes, levies, imposts, duties, deductions, withholdings, assessments, fees or other charges imposed by any Governmental Authority (including any interest, additions to tax or penalties applicable thereto). Specifically, however, if at any time any Governmental Authority, applicable law, regulation or international agreement requires Borrower to make any withholding or deduction from any such payment or other sum payable hereunder to Agent, Borrower hereby covenants and agrees that the amount due from Borrower with respect to such payment or other sum payable hereunder will be increased to the extent necessary to ensure that, after the making of such required withholding or deduction (including any required withholding or deduction with respect to the increased amount), Agent receives a net sum equal to the sum which it would have received had no withholding or deduction been required, and Borrower shall pay the full amount withheld or deducted to the relevant Governmental Authority. Borrower will, upon request, furnish Agent with proof reasonably satisfactory to Agent indicating that Borrower has made such withholding payment; provided, however, that Borrower need not make any withholding payment if the amount or validity of such withholding payment is contested in good faith by appropriate and timely proceedings and as to which payment in full is bonded or reserved against by Borrower. Borrower will indemnify and hold harmless Agent and the Lenders for, and upon written request of Agent reimburse Agent and the Lenders for the amount of, any taxes levied or imposed on or paid by Agent or any lender (whether or not correctly levied, imposed or paid) as a result of (i) Borrower's failure to withhold such taxes and pay them to the relevant Governmental Authority, or (ii) any indemnification or reimbursement paid hereunder. Agent and the Lenders shall provide to Borrower, as soon as reasonably practicable, any refunds of such amounts received by Agent or any Lender (if any). The agreements and obligations of Borrower contained in this Section 1.6 shall survive the termination of this Agreement.

1.7 Change in Circumstances.

(a) **Increased Costs.** If any Change in Law shall: (i) impose, modify or deem applicable any reserve, special deposit, compulsory loan, insurance charge or similar requirement against assets of, deposits with or for the account of, or advances, loans or other credit extended or participated in by, Agent, (ii) subject Agent to any Taxes (other than (A) Indemnified Taxes, (B) Taxes described in clauses (b) through (d) of the definition of Excluded Taxes, and (C) Connection Income Taxes) on its loans, loan principal, letters of credit, commitment, or other obligations, or its deposits, reserves, other liabilities or capital attributable thereto, or (iii) impose on Agent any other condition, cost or expense (other than Taxes) affecting this Agreement or Credit Extensions made by Agent, and the result of any of the foregoing shall be to increase the cost to Agent of making, converting to, continuing or maintaining any Credit Extension (or of maintaining its obligation to make any such Credit Extension), or to reduce the amount of any sum received or receivable by Agent hereunder (whether of principal, interest or any other amount) then, upon written request of Agent, Borrower shall promptly pay to Agent such additional amount or amounts as will compensate Agent for such additional costs incurred or reduction suffered.

(b) **Capital Requirements.** If Agent determines that any Change in Law affecting Agent regarding capital or liquidity requirements, has or would have the effect of reducing the rate of return on Agent's capital as a consequence of this Agreement, any term loan facility, or the Credit Extensions made by Agent to a level below that which Agent could have achieved but for such Change in Law (taking into consideration Agent's policies with respect to capital adequacy and liquidity), then from time to time upon written request of Agent, Borrower shall promptly pay to Agent such additional amount or amounts as will compensate Agent for any such reduction suffered.

(c) **Delay in Requests.** Failure or delay on the part of Agent to demand compensation pursuant to this Section 1.7 shall not constitute a waiver of Agent's right to demand such compensation; provided that Borrower shall not be required to compensate Agent pursuant to subsection (a) for any increased costs incurred or reductions suffered more than nine (9) months prior to the date that Agent notifies Borrower of the Change in

Law giving rise to such increased costs or reductions (except that if the Change in Law giving rise to such increased costs or reductions is retroactive, then the nine (9) month period shall be extended to include the period of retroactive effect).

1.8 Taxes.

(a) Payments Free of Taxes. Any and all payments by or on account of any obligation of Borrower under any Loan Document shall be made without deduction or withholding for any Taxes, except as required by Applicable Law. If any Applicable Law (as determined in the good faith discretion of Borrower) requires the deduction or withholding of any Tax from any such payment by Borrower, then (i) Borrower shall be entitled to make such deduction or withholding, (ii) Borrower shall timely pay the full amount deducted or withheld to the relevant Governmental Authority in accordance with Applicable Law, and (iii) if such Tax is an Indemnified Tax, the sum payable by Borrower shall be increased as necessary so that after such deduction or withholding has been made (including such deductions and withholdings applicable to additional sums payable under this Section 1.8) Agent receives an amount equal to the sum it would have received had no such deduction or withholding been made.

(b) Payment of Other Taxes by Borrower. Without limiting the provisions of subsection (a) above, Borrower shall timely pay any Other Taxes to the relevant Governmental Authority in accordance with Applicable Law.

(c) Tax Indemnification. Without limiting the provisions of subsections (a) and (b) above, Borrower shall, and does hereby, indemnify Agent, within ten (10) days after demand therefor, for the full amount of any Indemnified Taxes (including Indemnified Taxes imposed or asserted on or attributable to amounts payable under this Section 1.8) payable or paid by Agent or required to be withheld or deducted from a payment to Agent and any reasonable expenses arising therefrom or with respect thereto, whether or not such Indemnified Taxes were correctly or legally imposed or asserted by the relevant Governmental Authority. A certificate as to the amount of such payment or liability delivered to Borrower by Agent shall be conclusive absent manifest error.

(d) Evidence of Payments. As soon as practicable after any payment of Taxes by Borrower to a Governmental Authority pursuant to this Section 1.8, Borrower shall deliver to Agent a certified copy of a receipt issued by such Governmental Authority evidencing such payment, a copy of the return reporting such payment or other evidence of such payment reasonably satisfactory to Agent.

(e) Status of Agent. If Agent (including any assignee or successor) is entitled to an exemption from or reduction of withholding tax with respect to payments made under any Loan Document, it shall deliver to Borrower, at the time or times reasonably requested by Borrower, such properly completed and executed documentation reasonably requested by Borrower as will permit such payments to be made without withholding or at a reduced rate of withholding. In addition, Agent, if reasonably requested by Borrower, shall deliver such other documentation prescribed by Applicable Law or reasonably requested by Borrower as will enable Borrower to determine whether or not Agent is subject to backup withholding or information reporting requirements. Without limiting the generality of the foregoing, Agent shall deliver whichever of IRS Form W-9, IRS Form W-8BEN-E, IRS Form W-8ECI or W-8IMY is applicable, as well as any applicable supporting documentation or certifications. . Agent agrees that if any form or certification it previously delivered expires or becomes obsolete or inaccurate in any respect, it shall update such form or certification or promptly notify the Borrower in writing of its legal inability to do so.

1.9 Procedures for Borrowing.

(a) Subject to the prior satisfaction of all other applicable conditions to the making of a Credit Extension set forth in this Agreement (which must be satisfied no later than 12:00 p.m. Eastern time on the applicable Funding Date), to obtain a Credit Extension, Borrower shall notify Agent (which notice shall be irrevocable) by 12:00 p.m. Eastern time at least five (5) Business Days prior to the proposed Funding Date of such Credit Extension. Such notice shall be made by electronic mail, facsimile, or telephone, and, together with any such notification, Borrower shall deliver to Agent by electronic mail or facsimile a completed Disbursement Letter (and Payment/Advance Form) executed by an Authorized Signer and such other reports and information as Agent may

reasonably request. Agent may rely on any telephone notice given by a person whom Agent believes is an Authorized Signer. Borrower will indemnify Agent for any loss Agent suffers due to such belief or reliance. Agent shall have received satisfactory evidence that the Board has approved that such Authorized Signer may provide such notices and request Credit Extensions (which requirement may be deemed satisfied by the prior delivery of Borrowing Resolutions or a secretary's certificate that certifies as to such Board approval).

(b) On the Funding Date, Agent shall credit the Credit Extensions to the Designated Deposit Account. Agent may make Credit Extensions under this Agreement based on instructions from an Authorized Signer or without instructions if the Credit Extensions are necessary to meet Obligations which have become due.

(c) **Funding.** In determining compliance with any condition hereunder to the making of a Credit Extension that, by its terms, must be fulfilled to the satisfaction of a Lender, Agent may presume that such condition is satisfactory to such Lender unless Agent shall have received notice to the contrary from such Lender prior to the making of such Credit Extension. Unless Agent shall have been notified in writing by any Lender prior to the date of any Credit Extension, that such Lender will not make the amount that would constitute its share of such borrowing available to Agent, Agent may assume that such Lender is making such amount available to Agent, and Agent may, in reliance upon such assumption, make available to Borrower a corresponding amount. If such amount is not made available to Agent by the required time on the Funding Date therefor, such Lender shall pay to Agent, on demand, such amount with interest thereon, at a rate equal to the greater of (i) the Federal Funds Effective Rate or (ii) a rate determined by Agent in accordance with banking industry rules on interbank compensation, for the period until such Lender makes such amount immediately available to Agent. If such Lender's share of such Credit Extension is not made available to Agent by such Lender within three (3) Business Days after such Funding Date, Agent shall also be entitled to recover such amount with interest thereon at the rate per annum applicable to the Term Loan Advances, on demand, from Borrower.

2 **CONDITIONS OF CREDIT EXTENSIONS**

2.1 Conditions Precedent to Initial Credit Extension. Each Lender's obligation to make the initial Credit Extension hereunder is subject to the condition precedent that Agent shall have received, in form and substance satisfactory to Agent and the Lenders, such documents, and completion of such other matters, as Agent may reasonably have requested, including, without limitation:

(a) duly executed Loan Documents;

(b) the Operating Documents of Borrower and long-form good standing certificates of Borrower certified by the Secretary of State of the State of Delaware and the Secretary of State (or equivalent agency) of each other jurisdiction in which Borrower is qualified to conduct business, in each case dated as of a date no earlier than thirty (30) days prior to the Effective Date;

(c) a secretary's certificate/officer's certificate (as applicable) duly executed by a Responsible Officer or secretary of Borrower with respect to Borrower's Operating Documents, incumbency, specimen signatures and resolutions authorizing the execution and delivery of this Agreement and the other Loan Documents to which it is a party;

(d) duly executed Borrowing Resolutions for Borrower;

(e) with respect to the Initial Tranche A Term Loan Advance, a completed and duly executed Payment/Advance Form;

(f) with respect to the Initial Tranche A Term Loan Advance, a completed and duly executed Disbursement Letter;

(g) certified copies, dated as of a recent date, of searches for Liens (including without limitation, UCC searches) filed in the central filing office of the State of Delaware, accompanied by written evidence (including any UCC termination statements and other Lien releases) that the Liens indicated in any such

financing statements or other filings either constitute Permitted Liens or have been or, in connection with the initial Credit Extension hereunder, will be terminated or released;

(h) a legal opinion of Borrower's counsel dated as of the Effective Date;

(i) stock power forms (5 originals) executed by Borrower with respect to capital stock of AVROBIO Securities Corporation and delivery of stock certificates evidencing ownership interests in AVROBIO Securities Corporation delivered to Agent for the benefit of the Lenders;

(j) duly executed Perfection Certificate of Borrower;

(k) stock power forms (5 originals) executed by Borrower MSC Subsidiary with respect to the capital stock of AVROBIO Securities Corporation together with stock certificates evidencing ownership interests in AVROBIO Securities Corporation;

(l) evidence satisfactory to Agent that the insurance policies required by Section 5.56 hereof are in full force and effect with respect to Borrower; and

(m) payment of the fees and Lenders' Expenses then due as specified in Section 1.3 hereof.

2.2 Conditions Precedent to all Credit Extensions. Each Lender's obligation to make each Credit Extension, including the initial Credit Extension, is subject to the following conditions precedent:

(a) receipt of Borrower's (i) executed Disbursement Letter and (ii) executed Payment/Advance Form;

(b) the representations and warranties in this Agreement shall be true and correct in all material respects as of the date of the Disbursement Letter (and the Payment/Advance Form) and as of the Funding Date of each Credit Extension; provided, however, that such materiality qualifier shall not be applicable to any representations and warranties that already are qualified or modified by materiality in the text thereof; and provided, further that those representations and warranties expressly referring to a specific date shall be true and correct in all material respects as of such date, and no Event of Default shall have occurred and be continuing or result from the Credit Extension. Each Credit Extension is Borrower's representation and warranty on that date that the representations and warranties in this Agreement are true and correct in all material respects as of such date; provided, however, that such materiality qualifier shall not be applicable to any representations and warranties that already are qualified or modified by materiality in the text thereof; and provided, further that those representations and warranties expressly referring to a specific date shall be true and correct in all material respects as of such date; and

(c) a Material Adverse Change shall not have occurred and be continuing.

2.3 Covenant to Deliver. Borrower shall deliver to Agent and each Lender each item required to be delivered to Agent and each Lender under this Agreement as a condition precedent to any Credit Extension. A Credit Extension made prior to the receipt by Agent and each Lender of any such item shall not constitute a waiver by Agent or Lenders of Borrower's obligation to deliver such item, and the making of any Credit Extension in the absence of a required item shall be in each Lender's sole discretion.

3 CREATION OF SECURITY INTEREST

3.1 Grant of Security Interest.

(a) Borrower hereby grants Agent, for the ratable benefit of the Lenders, to secure the payment and performance in full of all of the Obligations, a continuing security interest in, and pledges to Agent, for the ratable benefit of the Lenders, the Collateral, wherever located, whether now owned or hereafter acquired or arising, and all proceeds and products thereof. For clarity, any reference to "Agent's Lien" or any granting of

collateral to Agent in this Agreement or any Loan Document means the Lien granted to Agent for the ratable benefit of the Lenders.

(b) Borrower acknowledges that it previously has entered, or may in the future enter, into Bank Services Agreements with SVB. Regardless of the terms of any Bank Services Agreement, Borrower agrees that any amounts Borrower owes SVB thereunder shall be deemed to be Obligations hereunder and that it is the intent of Borrower and SVB to have all such Obligations secured by the first priority perfected security interest in the Collateral granted herein (subject to Permitted Liens).

3.2 Authorization to File Financing Statements. Borrower hereby authorizes Agent, on behalf of the Lenders, to file financing statements, without notice to Borrower, with all jurisdictions deemed necessary or appropriate by Agent to perfect or protect Agent's and Lenders' interest or rights hereunder, including a notice that any disposition of the Collateral in violation of this Agreement, by Borrower or any other Person, shall be deemed to violate the rights of Agent under the Code. Such financing statements may indicate the Collateral as "all assets of the Debtor" or words of similar effect.

3.3 Termination. If this Agreement is terminated, Agent's Lien in the Collateral shall continue until the Obligations (other than inchoate indemnity obligations) are repaid in full in cash. Upon payment in full in cash of the Obligations (other than inchoate indemnity obligations) and at such time as the Lenders' obligation to make Credit Extensions has terminated, Agent shall, at Borrower's sole cost and expense, terminate its security interest in and Liens on the Collateral and all rights therein shall revert to Borrower. In the event (a) all Obligations (other than inchoate indemnity obligations), except for Bank Services, are satisfied in full, and (b) this Agreement is terminated, Agent shall terminate the security interest and Lien granted herein upon Borrower providing to SVB cash collateral acceptable to SVB in its sole discretion for outstanding Bank Services, if any. In the event such Bank Services consist of outstanding Letters of Credit, Borrower shall provide to SVB cash collateral in an amount equal to at least (i) one hundred five percent (105.0%) of the face amount of all such Letters of Credit denominated in Dollars and (ii) one hundred ten percent (110.0%) of the Dollar Equivalent of the face amount of all such Letters of Credit denominated in a Foreign Currency, plus, in each case, all interest, fees, and costs due or estimated by SVB to become due in connection therewith, to secure all of the Obligations relating to such Letters of Credit.

4 REPRESENTATIONS AND WARRANTIES

Borrower represents and warrants as follows:

4.1 Due Organization, Authorization; Power and Authority.

(a) Borrower and each of its Subsidiaries are each duly existing and in good standing as a Registered Organization in their respective jurisdiction of formation and are qualified and licensed to do business and is in good standing in any jurisdiction in which the conduct of their respective business or their ownership of property requires that they be qualified except where the failure to do so could not reasonably be expected to have a material adverse effect on Borrower's business or operations.

(b) All information set forth on the Perfection Certificate pertaining to Borrower and each of its Subsidiaries is true and correct (it being understood and agreed that Borrower may from time to time update certain information in the Perfection Certificate after the Effective Date to the extent permitted by one or more specific provisions in this Agreement and the Perfection Certificate shall be deemed to be updated to the extent such notice is provided to Agent of such permitted update).

(c) The execution, delivery and performance by Borrower and each of its Subsidiaries of the Loan Documents to which it is a party have been duly authorized, and do not (i) conflict with any of Borrower's or any such Subsidiary's organizational documents, (ii) contravene, conflict with, constitute a default under or violate any material Applicable Law, (iii) contravene, conflict with or violate any applicable order, writ, judgment, injunction, decree, determination or award of any Governmental Authority by which Borrower or any of its Subsidiaries or any of their property or assets may be bound or affected, (iv) require any action by, filing, registration, or qualification with, or Governmental Approval from, any Governmental Authority (except financing

statements filed in connection herewith and such Governmental Approvals which have already been obtained and are in full force and effect or are to be obtained pursuant to Section 5.2(b)), or (v) conflict with, contravene, constitute a default or breach under, or result in or permit the termination or acceleration of, any material agreement by which Borrower or any of its Subsidiaries is bound. Neither Borrower nor any of its Subsidiaries are in default under any agreement to which it is a party or by which it is bound in which the default could reasonably be expected to have a material adverse effect on Borrower's or any of its Subsidiary's business or operations.

4.2 Collateral.

(a) The security interests granted herein are and shall at all times continue to be a first priority perfected security interests in the Collateral (subject to Permitted Liens). Borrower has good title to, rights in, and the power to transfer each item of the Collateral upon which it purports to grant a Lien hereunder, free and clear of any and all Liens except Permitted Liens.

(b) Borrower has no Collateral Accounts at or with any bank or financial institution other than SVB or SVB's Affiliates except for the Collateral Accounts described in the Perfection Certificate delivered to Agent and each Lender in connection herewith and which Borrower has taken such actions as are necessary to give Agent, for the ratable benefit of the Lenders, a first priority perfected security interest therein, to the extent required pursuant to the terms of Section 5.7(a). The Accounts are bona fide, existing obligations of the Account Debtors.

(c) No Collateral with fair market value in excess of Five Hundred Thousand Dollars (\$500,000) is in the possession of any third party bailee (such as a warehouse) except as otherwise provided in the Perfection Certificate or as permitted pursuant to Section 6.2. None of the components of the Collateral (other than mobile equipment such as laptop computers and personal digital assistants in the possession of Borrower's employees or agents) shall be maintained at locations other than as provided in the Perfection Certificate or as permitted pursuant to Section 6.2.

(d) All Inventory is in all material respects of good and marketable quality, free from material defects.

(e) Borrower owns, or possesses the right to use to the extent necessary in its business, all Intellectual Property, licenses and other intangible assets that are necessary for the conduct of its business as now operated, except to the extent that such failure to own or possess the right to use such asset would not reasonably be expected to have a material adverse effect on Borrower's business or operations, and no such asset, to the knowledge of Borrower, conflicts with the valid Intellectual Property, license, or intangible asset of any other Person to the extent that such conflict could reasonably be expected to have a material adverse effect on Borrower's business or operations.

(f) Except as noted on the Perfection Certificate or for which notice has been given to Agent pursuant to and in accordance with Section 5.9(b), Borrower is not a party to, nor is it bound by, any Restricted License.

4.3 Litigation. Other than as set forth in the Perfection Certificate or as disclosed to Agent pursuant to Section 5.3(i), there are no actions, investigations or proceedings pending or, to the knowledge of any Responsible Officer, threatened in writing by or against Borrower or any of its Subsidiaries involving more than, individually or in the aggregate, Five Hundred Thousand Dollars (\$500,000).

4.4 Financial Statements; Financial Condition. All consolidated financial statements for Borrower and any of its Subsidiaries delivered to Agent and the Lenders by submission to the Financial Statement Repository or otherwise submitted to Agent and the Lenders fairly present in all material respects Borrower's consolidated financial condition as of the date thereof and Borrower's consolidated results of operations for the periods covered thereby, subject, in the case of unaudited financial statements, to normal year-end adjustments and the absence of footnote disclosures. There has not been any material deterioration in Borrower's consolidated financial condition since the date of the most recent financial statements submitted to the Financial Statement Repository or otherwise submitted to Agent and the Lenders by Borrower.

4.5 Solvency. The fair salable value of Borrower's consolidated assets (including goodwill minus disposition costs) exceeds the fair value of Borrower's liabilities; Borrower is not left with unreasonably small capital after the transactions in this Agreement; and Borrower and each of its Subsidiaries are able to pay their debts (including trade debts) as they mature.

4.6 Regulatory Compliance. Borrower is not an "investment company" or a company "controlled" by an "investment company" under the Investment Company Act of 1940, as amended. Borrower is not 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 (a) have complied in all material respects with all Applicable Law, and (b) have not violated any Applicable Law the violation of which could reasonably be expected to have a material adverse effect on Borrower's business or operations. Borrower and each of its Subsidiaries have duly complied with, and their respective facilities, business, assets, property, leaseholds, real property and Equipment are in compliance with, Environmental Laws, except where the failure to do so could not reasonably be expected to have a material adverse effect on Borrower's business or operations; there have been no outstanding citations, notices or orders of non-compliance issued to Borrower or any of its Subsidiaries or relating to their respective facilities, businesses, assets, property, leaseholds, real property or Equipment under such Environmental Laws except as could not reasonably be expected to have a material adverse effect on Borrower's business or operations. Borrower and each of its Subsidiaries have 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, except where the failure to obtain or make or file the same would not reasonably be expected to have a material adverse effect on Borrower's business or operations.

4.7 Subsidiaries; Investments. Borrower does not own any stock, partnership, or other ownership interest or other equity securities except for Permitted Investments.

4.8 Tax Returns and Payments; Pension Contributions.

(a) Borrower and each of its Subsidiaries have timely filed, or submitted extensions for, all required tax returns and reports, and Borrower and each of its Subsidiaries have timely paid all foreign, federal, state and local taxes, assessments, deposits and contributions owed by Borrower and each of its Subsidiaries except (i) to the extent such taxes are being contested in good faith by appropriate proceedings promptly instituted and diligently conducted, so long as such reserve or other appropriate provision, if any, as shall be required in conformity with GAAP shall have been made therefor, or (ii) if such taxes, assessments, deposits and contributions do not, individually or in the aggregate, exceed Twenty-Five Thousand Dollars (\$25,000). Borrower is unaware of any claims or adjustments proposed for any of Borrower's or any of its Subsidiary's prior tax years which could result in additional taxes becoming due and payable by Borrower or any of its Subsidiaries in excess of Fifty Thousand Dollars (\$50,000) in the aggregate.

(b) Borrower and each of its Subsidiaries have paid all amounts necessary to fund all present pension, profit sharing and deferred compensation plans in accordance with their terms, and neither Borrower nor any of its Subsidiaries has withdrawn from participation in, and has not permitted partial or complete termination of, or permitted the occurrence of any other event with respect to, any such plan which could reasonably be expected to result in any liability of Borrower or any of its Subsidiaries, including any liability to the Pension Benefit Guaranty Corporation or its successors or any other Governmental Authority.

4.9 Full Disclosure. No written representation, warranty or other statement of Borrower or any of its Subsidiaries in any report, certificate or written statement submitted to the Financial Statement Repository or otherwise submitted to Agent and Lenders by Borrower in connection with the Loan Documents or the transactions contemplated thereby, as of the date such representation, warranty, or other statement was made, taken together with all such reports, certificates and written statements submitted to the Financial Statement Repository or otherwise submitted to Agent and Lenders by Borrower in connection with the Loan Documents or the transactions contemplated thereby, contains any untrue statement of a material fact or omits to state a material fact necessary to make the statements contained in the reports, certificates or written statements not misleading in light of the circumstances under which they were made (it being recognized by Agent and Lenders that the projections and forecasts provided by Borrower or any of its Subsidiaries in good faith and based upon reasonable assumptions are

not viewed as facts and that actual results during the period or periods covered by such projections and forecasts may differ from the projected or forecasted results).

4.10 Sanctions. Neither Borrower nor any of its Subsidiaries is: (a) in violation of any Sanctions; or (b) a Sanctioned Person. Neither Borrower nor any of its Subsidiaries, directors, officers, employees, agents or Affiliates: (i) conducts any business or engages in any transaction or dealing with any Sanctioned Person, including making or receiving any contribution of funds, goods or services to or for the benefit of any Sanctioned Person; (ii) deals in, or otherwise engages in any transaction relating to, any property or interests in property blocked pursuant to any Sanctions; (iii) engages in or conspires 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 Sanctions; or (iv) otherwise engages in any transaction that could cause Agent or the Lenders to violate any Sanctions.

4.11 Healthcare Permits. (a) Borrower has obtained all Healthcare Permits and other rights from, and has made all declarations and filings with, all applicable Governmental Authorities, all self-regulatory authorities and all courts and other tribunals necessary to engage in the management and/or operation of their respective business, except where the failure to do so would not reasonably be expected to have a material adverse effect on Borrower's business or operations; (b) each such Healthcare Permit is valid and in full force and effect, and Borrower is in compliance in all material respects with the terms and conditions of all such Healthcare Permits; and (c) Borrower has not received notice from any Governmental Authority with respect to the revocation, suspension, restriction, limitation or termination of any Healthcare Permit nor, to the knowledge of Borrower, is any such action proposed or threatened in writing.

4.12 Compliance with Healthcare Laws.

(a) Borrower is in compliance in all material respects with all applicable Healthcare Laws. Without limiting the generality of the foregoing, Borrower has not received written notice by a governmental authority of any violation (or of any investigation, audit, or other proceeding involving allegations of any violation) of any Healthcare Laws, and no investigation, inspection, audit or other proceeding involving allegations of any violation is, to the knowledge of Borrower, threatened in writing or contemplated.

(b) To the knowledge of Borrower, Borrower is not in default or violation of any law which is applicable to Borrower or its respective assets or the conduct of its respective businesses and Borrower has not been debarred or excluded from participation under a state or federal health care program, including any state or federal workers compensation program.

(c) Borrower is not a party to any corporate integrity agreements, deferred prosecution agreements, monitoring agreements, consent decrees, settlement orders or similar agreements with or imposed by any governmental authority.

5 AFFIRMATIVE COVENANTS

Borrower shall do all of the following:

5.1 Use of Proceeds. Cause the proceeds of the Credit Extensions to be used (a) as working capital or (b) to fund its general business purposes, and not for personal, family, household or agricultural purposes.

5.2 Government Compliance.

(a) Maintain its and all of its Subsidiaries' legal existence (except as permitted under Section 6.3 with respect to Subsidiaries only) and good standing in their respective jurisdictions of formation and maintain qualification in each jurisdiction in which the failure to so qualify would reasonably be expected to have a material adverse effect on Borrower's business or operations. Borrower shall comply, and have each Subsidiary comply, in all material respects, with all laws, ordinances and regulations to which it is subject.

(b) Obtain all of the Governmental Approvals necessary for the performance by Borrower and each of its Subsidiaries of their obligations under the Loan Documents to which it is a party, including any grant of a security interest to Agent, for the ratable benefit of the Lenders, in the Collateral. Borrower shall promptly provide copies of any such obtained Governmental Approvals to Agent.

(c) Cause the operations and property of Borrower and each of its Subsidiaries to comply in all material respects with all applicable Healthcare Laws. Without limiting the foregoing, the operations and property of Borrower and each of its Subsidiaries shall comply with HIPAA in all material respects. Borrower established and maintains a corporate compliance program that (i) addresses the material Requirements of Law, including all applicable Healthcare Laws, of Governmental Authorities having jurisdiction over its business and operations, and (ii) has been structured to account for the guidance issued by the U.S. Department of Health and Human Services regarding characteristics of effective corporate compliance programs.

5.3 Financial Statements, Reports. Deliver to Agent and each Lender by submitting to the Financial Statement Repository:

(a) Quarterly Financial Statements. Subject to Section 5.3(e) below, as soon as available, but no later than forty-five (45) days after the last day of each calendar quarter (ninety (90) days for the last quarter of Borrower's fiscal year), a company prepared consolidated and consolidating (if applicable) balance sheet, cash flow statement, and income statement covering Borrower's and each of its Subsidiaries' operations for such calendar quarter in a form consistent with those filed with SEC; provided, however, that if any of the aforementioned deliverables are prepared but not filed with the SEC, such deliverables shall be provided to each Lender;

(b) Quarterly Compliance Statement. Within forty-five (45) days after the last day of each quarterly end and together with the statements set forth in Section 5.3(a), a duly completed Compliance Statement, confirming that as of the end of such quarter, Borrower was in full compliance with all of the terms and conditions of this Agreement, and setting forth calculations showing compliance with the financial covenants (if any) set forth in this Agreement and such other information as Agent or the Lenders may reasonably request;

(c) Annual Operating Budget and Financial Projections. Within sixty (60) days after the last day of each fiscal year of Borrower, and contemporaneously with any updates or amendments thereto, (i) annual operating budgets (including income statements, balance sheets and cash flow statements, by quarter) for the then-current fiscal year of Borrower, and (ii) annual financial projections for the then-current fiscal year (on a quarterly basis), in each case as approved by the Board, together with any related business forecasts used in the preparation of such annual financial projections;

(d) Annual Audited Financial Statements. As soon as available, and in any event within one hundred eighty (180) days following the end of Borrower's fiscal year, audited consolidated financial statements prepared under GAAP, consistently applied, together with an unqualified opinion on the financial statements from an independent certified public accounting firm reasonably acceptable to Agent and in a form consistent with those filed with SEC;

(e) SEC Filings. Within five (5) days of filing, notification of the filing and copies of all periodic and other reports, proxy statements and other materials filed by Borrower and/or any of its Subsidiaries with the SEC, any Governmental Authority succeeding to any or all of the functions of the SEC or with any national securities exchange, or distributed to its shareholders, as the case may be. Documents required to be delivered pursuant to the terms hereof (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 or any of its Subsidiaries posts such documents, or provides a link thereto, on Borrower's or any of its Subsidiaries' website on the internet at Borrower's or any of its Subsidiaries' website address;

(f) Security Holder and Subordinated Debt Holder Reports. Within five (5) days of delivery, copies of all statements, reports and notices made available to Borrower's security holders generally or to any holders of Subordinated Debt (solely in their capacities as security holders or holders of Subordinated Debt and not in any other role), other than proxy statements filed with the SEC in connection with Borrower's annual meetings of stockholders;

(g) Beneficial Ownership Information. At any time that Borrower is not a public company or an issuer of securities that are registered with the SEC under Section 12 of the Exchange Act (or that is required to file reports under Section 15(d) of the Exchange Act), prompt written notice of any changes to the beneficial ownership information set out in Section 14 of the Perfection Certificate. Borrower understands and acknowledges that each Lender relies on such true, accurate and up-to-date beneficial ownership information to meet such Lender's regulatory obligations to obtain, verify and record information about the beneficial owners of its legal entity customers;

(h) Legal Action Notice. Prompt written notice of any legal actions, investigations or proceedings pending or threatened in writing against Borrower or any of its Subsidiaries that could reasonably be expected to result in damages or costs to Borrower or any of its Subsidiaries of, individually or in the aggregate, Five Hundred Thousand Dollars (\$500,000) or more;

(i) Tort Claim Notice. If Borrower shall acquire a commercial tort claim, Borrower shall promptly notify Agent in a writing signed by Borrower of the general details thereof and grant to Agent, for the ratable benefit of the Lenders, in such writing a security interest therein and in the proceeds thereof, all upon the terms of this Agreement, with such writing to be in form and substance reasonably satisfactory to Agent;

(j) Government Filings. Within five (5) days after the same are sent or received, copies of all correspondence, reports, documents and other filings by Borrower or any of its Subsidiaries with any Governmental Authority regarding compliance with or maintenance of Governmental Approvals or Applicable Law that could reasonably be expected to have a material effect on any of the Governmental Approvals or otherwise on the business of Borrower or any of its Subsidiaries;

(k) Registered Organization. If Borrower is not a Registered Organization as of the Effective Date but later becomes one, promptly notify Agent of such occurrence and provide Agent with Borrower's organizational identification number;

(l) Bank Statements. Within thirty (30) days after the end of each month, bank statements for all accounts maintained outside of SVB by any MSC Subsidiary;

(m) Default. Prompt written notice of the occurrence of a Default or Event of Default; and

(n) Other Financial Information. Promptly, from time to time, such other financial information as reasonably requested by Agent or any Lender.

Any submission by Borrower of a Compliance Statement or any other financial statement submitted to the Financial Statement Repository pursuant to this Section 5.3 or otherwise submitted to Agent and the Lenders shall be deemed to be a representation by Borrower that (i) as of the date of such Compliance Statement or other financial statement, the information and calculations set forth therein are true and correct, (ii) as of the end of the compliance period set forth in such submission, Borrower is in complete compliance with all required covenants except as noted in such Compliance Statement or other financial statement, as applicable, (iii) as of the date of such submission, no Events of Default have occurred or are continuing, (iv) all representations and warranties other than any representations or warranties that are made as of a specific date in Section 4 are true and correct in all material respects as of the date of such submission except as noted in such Compliance Statement or other financial statement, as applicable, (v) as of the date of such submission, Borrower and each of its Subsidiaries has timely filed all required tax returns and reports, and Borrower has timely paid all foreign, federal, state and local taxes, assessments, deposits and contributions owed by Borrower except as otherwise permitted pursuant to the terms of Section 4.8, and (vi) as of the date of such submission, no Liens have been levied or claims made against Borrower or any of its Subsidiaries relating to unpaid employee payroll or benefits of which Borrower has not previously provided written notification to Agent and Lenders.

5.4 Taxes; Pensions.

(a) Timely file, and require each of its Subsidiaries to timely file (in each case, unless subject to a valid extension), all required tax returns and reports and timely pay, and require each of its Subsidiaries to timely pay, all foreign, federal, state and local taxes, assessments, deposits and contributions owed by Borrower and each of its Subsidiaries in excess of Fifty Thousand Dollars (\$50,000) individually or in the aggregate, except for deferred payment of any taxes contested pursuant to the terms of Section 4.8(a) hereof, and shall deliver to Agent, on demand, appropriate certificates attesting to such payments, and pay, and require each of its Subsidiaries to pay, all amounts necessary to fund all present pension, profit sharing and deferred compensation plans in accordance with their terms.

(b) To the extent Borrower or any of its Subsidiaries defers payment of any contested taxes, (i) notify Agent in writing of the commencement of, and any material development in, the proceedings, and (ii) post bonds or take any other steps required to prevent the Governmental Authority levying such contested taxes from obtaining a Lien upon any of the Collateral that is other than a "Permitted Lien."

5.5 Access to Collateral; Books and Records. Allow Agent or its agents, at reasonable times, on one (1) Business Days' notice (provided no notice is required if an Event of Default has occurred and is continuing), to inspect the Collateral and audit and copy Borrower's Books. Such inspections or audits shall be conducted as frequently as Agent determines in its sole discretion that conditions warrant. The foregoing inspections and audits shall be conducted at Borrower's expense, and the charge therefor shall be One Thousand Dollars (\$1,000) per person per day (or such higher amount as shall represent Agent's then-current standard charge for the same), plus reasonable out-of-pocket expenses. In the event Borrower and Agent schedule an audit more than eight (8) days in advance, and Borrower cancels or seeks to reschedule the audit with less than eight (8) days written notice to Agent, then (without limiting any of Agent's or any Lender's rights or remedies), Borrower shall pay Agent a fee of Two Thousand Dollars (\$2,000) plus any reasonable out-of-pocket expenses incurred by Agent to compensate Agent for the anticipated costs and expenses of the cancellation or rescheduling.

5.6 Insurance.

(a) Keep its business and the Collateral insured for risks and in amounts standard for companies of Borrower's size in Borrower's industry and location and as Agent may reasonably request. Insurance policies shall be in a form, with financially sound and reputable insurance companies that are not Affiliates of Borrower, and in amounts that are satisfactory to Agent.

(b) All property policies shall have a lender's loss payable endorsement showing Agent as lender loss payee. Notwithstanding the foregoing, (a) so long as no Event of Default has occurred and is continuing, Borrower shall have the option of applying the proceeds of any casualty policy up to Five Hundred Thousand Dollars (\$500,000) with respect to any loss, but not exceeding One Million Dollars (\$1,000,000) in the aggregate for all losses under all casualty policies in any twelve (12) month period, toward the replacement or repair of destroyed or damaged property; provided that any such replaced or repaired property (i) shall be of equal or like value as the replaced or repaired Collateral and (ii) shall be deemed Collateral in which Agent has been granted a first priority security interest (subject only to Permitted Liens that are permitted pursuant to the terms of this Agreement to have superior priority to Agent's Lien), and (b) after the occurrence and during the continuance of an Event of Default, all proceeds payable under such casualty policy shall, at the option of Agent, be payable to Agent on account of the Obligations then due. All liability policies shall show, or have endorsements showing, Agent as an additional insured. Agent shall be named as lender loss payee and/or additional insured with respect to any such insurance providing coverage in respect of any Collateral.

(c) Ensure that proceeds payable under any property policy are, at Agent's option, payable to Agent for the ratable benefit of the Lenders on account of the Obligations.

(d) At Agent's request (but not more frequently than semi-annually), Borrower shall deliver certified copies of insurance policies and evidence of all premium payments. Each provider of any such insurance required under this Section 5.56 shall agree, by endorsement upon the policy or policies issued by it or by independent instruments furnished to Agent, that it will give Agent thirty (30) days prior written notice before any

such policy or policies shall be canceled. In addition, Borrower shall give Agent fifteen (15) days prior written notice before any such policy is altered in any material respect. If Borrower fails to obtain insurance as required under this Section 5.6 or to pay any amount or furnish any required proof of payment to third persons and Agent, Agent may make all or part of such payment or obtain such insurance policies required in this Section 5.6, and take any action under the policies Agent deems prudent.

5.7 Operating Accounts.

(a) Maintain all of Borrower's, any of its Subsidiaries' (excluding MSC Subsidiaries), and any Guarantor's operating accounts, depository accounts and excess cash with SVB or SVB's Affiliates; provided, however, notwithstanding the foregoing, Borrower and its Subsidiaries may maintain Collateral Accounts outside of the United States and outside of SVB (the "**Foreign Accounts**") so long as the aggregate amount of cash maintained at any time in all Foreign Accounts taken together does not exceed One Million Dollars (\$1,000,000). In addition to the foregoing, Borrower shall at all times have on deposit in operating and depository accounts maintained in the name of Borrower with SVB, cash in an amount equal to the lesser of (i) one hundred percent (100.0%) of the Dollar value of Borrower's consolidated cash, including any Subsidiaries', Affiliates', or related entities' cash, in the aggregate, at all financial institutions, and (ii) one hundred ten percent (110.0%) of the then-outstanding Obligations of Borrower to Agent and the Lenders hereunder.

(b) In addition to the foregoing, Borrower, any Subsidiary of Borrower and any Guarantor, shall obtain any business credit card, Letter of Credit, and cash management services exclusively from SVB.

(c) In addition to and without limiting the restrictions in (a), Borrower shall provide Agent five (5) days prior written notice before establishing any Collateral Account at or with any bank or financial institution other than SVB or SVB's Affiliates. For each Collateral Account that Borrower at any time maintains, Borrower shall cause the applicable bank or financial institution (other than SVB) at or with which any Collateral Account is maintained to execute and deliver a Control Agreement or other appropriate instrument with respect to such Collateral Account to perfect Agent's Lien in such Collateral Account in accordance with the terms hereunder which Control Agreement may not be terminated without the prior written consent of the Lenders. The provisions of the previous sentence shall not apply to (i) deposit accounts exclusively used for payroll, payroll taxes, and other employee wage and benefit payments to or for the benefit of Borrower's employees and identified to Agent and the Lenders by Borrower as such, or (ii) the Foreign Accounts.

5.8 Reserved.

5.9 Protection of Intellectual Property Rights.

(a) (i) Use commercially reasonable efforts to protect, defend and maintain the validity and enforceability of Borrower's and each Subsidiary's Intellectual Property, except to the extent that such failure to do so would not reasonably be expected to have a material adverse effect on Borrower's business or operations; (ii) promptly advise Agent in writing of infringements or any other event that could reasonably be expected to materially and adversely affect the value Borrower's and each Subsidiary's Intellectual Property; and (iii) not allow any Intellectual Property material to Borrower's or any Subsidiary's business to be abandoned, forfeited or dedicated to the public without Agent's written consent.

(b) Provide written notice to Agent within ten (10) Business Days of entering or becoming bound by any Restricted License (other than over-the-counter software that is commercially available to the public). Borrower shall take such steps as Agent reasonably requests to obtain the consent of, or waiver by, any person whose consent or waiver is necessary for (i) any such Restricted License to be deemed "Collateral" and for Agent to have a security interest in it that might otherwise be restricted or prohibited by law or by the terms of any such Restricted License, whether now existing or entered into in the future, and (ii) Agent to have the ability in the event of a liquidation of any Collateral to dispose of such Collateral in accordance with Agent's and the Lenders' rights and remedies under this Agreement and the other Loan Documents.

5.10 Litigation Cooperation. From the date hereof and continuing through the termination of this Agreement, make available to Agent, without expense to Agent or any Lender and upon at least one (1) Business Days' notice (provided no notice is required if an Event of Default has occurred and is continuing), Borrower and its officers, employees and agents and Borrower's books and records, to the extent that Agent and/or the Lenders may deem them reasonably necessary to prosecute or defend any third-party suit or proceeding instituted by or against Agent and/or any Lender with respect to any Collateral or relating to Borrower.

5.11 Formation or Acquisition of Subsidiaries. Notwithstanding and without limiting the negative covenants contained in Sections 6.3 and 6.7 hereof, at the time that Borrower or any Guarantor forms any Subsidiary or acquires any Subsidiary after the Effective Date (including, without limitation, pursuant to a Division), Borrower and such Guarantor shall, (a) cause such new Subsidiary to provide to Lenders a joinder to this Agreement to cause such Subsidiary to become a co-Borrower or secured Guarantor hereunder (as determined by Agent in its sole discretion), together with documentation, all in form and substance satisfactory to Agent and Lenders (including being sufficient to grant Lenders a first priority Lien (subject to Permitted Liens) in and to the assets of such newly formed or acquired Subsidiary), (b) provide to Lenders appropriate certificates and powers and financing statements, pledging all of the direct or beneficial ownership interest in such new Subsidiary, in form and substance satisfactory to Agent and Lenders; and (c) provide to Lenders all other documentation requested by Agent with respect thereto in form and substance satisfactory to Agent and Lenders, if requested by Agent, including one or more opinions of counsel satisfactory to Lenders, which in its opinion is appropriate with respect to the execution and delivery of the applicable documentation referred to above. Any document, agreement, or instrument executed or issued pursuant to this Section 5.11 shall be a Loan Document.

5.12 Inventory; Returns. Keep all Inventory in good and marketable condition, free from material defects. Returns and allowances between Borrower and its Account Debtors shall follow Borrower's customary practices as they exist at the Effective Date. Borrower shall promptly notify Agent and the Lenders of all returns, recoveries, disputes and claims that involve more than Five Hundred Thousand Dollars (\$500,000).

5.13 Further Assurances. Execute any further instruments and take such further action as Agent and the Lenders reasonably request to perfect, protect, ensure the priority of or continue Agent's Lien on the Collateral or to effect the purposes of this Agreement.

5.14 Sanctions. (a) Not, and not permit any of its Subsidiaries to, engage in any of the activities described in Section 4.9 in the future; (b) not, and not permit any of its Subsidiaries to, become a Sanctioned Person; (c) ensure that the proceeds of the Obligations are not used to violate any Sanctions; and (d) deliver to Agent any certification or other evidence requested from time to time by Agent in its sole discretion, confirming each such Person's compliance with this Section 5.14. In addition, have implemented, and will consistently apply while this Agreement is in effect, procedures to ensure that the representations and warranties in Section 4.9 remain true and correct while this Agreement is in effect.

5.15 MSC Subsidiaries. If, at any time, Borrower forms another MSC Subsidiary, the Loan Parties shall, as soon as possible, but no later than ten (10) Business Days after the formation of such MSC Subsidiary deliver to Agent for the benefit of the Lenders stock power forms (5 originals) executed by the Loan Party that is the direct parent company of the new MSC Subsidiary with respect to capital stock of such MSC Subsidiary and deliver stock certificates evidencing ownership interests in such MSC Subsidiary.

5.16 Post-Closing Matters.

(a) Use its commercially reasonable efforts to deliver to Agent, within 30 days of the Effective Date, duly executed bailee's waiver in favor of Agent for each location where Borrower maintains property with a third party with fair market value in excess of Five Hundred Thousand Dollars (\$500,000), by each such third party;

(b) Deliver to Agent, within thirty (30) days of the Effective Date, evidence that the insurance endorsements required by Section 5.6 hereof are in full force and effect, together with appropriate evidence showing lender loss payable and/or additional insured clauses or endorsements in favor of Agent.

Borrower shall not do any of the following without the prior written consent of the Lenders:

6.1 Dispositions. Convey, sell, lease, transfer, assign, or otherwise dispose of (including, without limitation, pursuant to a Division) (collectively, a “**Transfer**”), or permit any of its Subsidiaries to Transfer, all or any part of its business or property, except for Transfers (a) of Inventory in the ordinary course of business; (b) of worn-out, obsolete or surplus Equipment that is, in the reasonable judgment of Borrower, no longer economically practicable to maintain or useful in the ordinary course of business of Borrower; (c) consisting of Permitted Liens and Permitted Investments; (d) consisting of the sale or issuance of any stock, partnership, membership, or other ownership interest or other equity securities of Borrower permitted under Section 6.2 of this Agreement; (e) consisting of Borrower’s or its Subsidiaries’ use or transfer of money or Cash Equivalents in a manner that is not prohibited by the terms of this Agreement or the other Loan Documents; (f) of non-exclusive licenses of Intellectual Property granted to third parties in the ordinary course of business and licenses of Intellectual Property that could not result in a legal transfer of title of the licensed property but that may be exclusive in respects other than territory and that may be exclusive as to territory only as to discrete geographical areas outside of the United States; and (g) other Transfers not otherwise permitted in clauses (a) through (f) above involving tangible assets of Borrower (but specifically excluding any Transfers of Accounts, monthly recurring revenue, annual recurring revenue or any other recurring revenue of Borrower in any factoring, sale-leaseback, future receipts purchase agreement or other similar agreement) having a fair market value of not more than Five Hundred Thousand Dollars (\$500,000) in the aggregate in any fiscal year so long as no Event of Default has occurred or would occur immediately following any such Transfer.

6.2 Changes in Business, Management, Control, or Business Locations. (a) Engage in or permit any of its Subsidiaries to engage in any business other than the businesses currently engaged in by Borrower and such Subsidiary, as applicable, or reasonably related thereto; (b) liquidate or dissolve or permit any of its Subsidiaries to liquidate or dissolve; (c) fail to provide notice to Agent and Lenders of any Key Person departing from or ceasing to be employed by Borrower within five (5) days after such Key Person’s departure from Borrower; (d) permit, allow or suffer to occur any Change in Control; or (e) without at least thirty (30) days prior written notice to Agent, (i) add any new office or business location, including warehouses (unless each such new office or business location contains less than Five Hundred Thousand Dollars (\$500,000) in Borrower’s assets or property) or deliver any portion of the Collateral valued, individually or in the aggregate, in excess of Five Hundred Thousand Dollars (\$500,000) to a bailee at a location other than to a bailee and at a location already disclosed in the Perfection Certificate, (ii) change its jurisdiction of organization, (iii) change its organizational structure or type, (iv) change its legal name, or (v) change any organizational number (if any) assigned by its jurisdiction of organization. If Borrower intends to add any new offices or business locations, including warehouses, containing in excess of Five Hundred Thousand Dollars (\$500,000) of Borrower’s assets or property, then Borrower will use commercially reasonable efforts to cause the landlord of any such new offices or business locations, including warehouses, to execute and deliver a landlord consent in form and substance satisfactory to Agent. If Borrower intends to deliver any portion of the Collateral valued, individually or in the aggregate, in excess of Five Hundred Thousand Dollars (\$500,000) to a bailee, and Agent and such bailee are not already parties to a bailee agreement governing both the Collateral and the location to which Borrower intends to deliver the Collateral, then Borrower will use commercially reasonable efforts to cause such bailee to execute and deliver a bailee agreement in form and substance satisfactory to Agent.

6.3 Mergers or Acquisitions. Merge or consolidate, or permit any of its Subsidiaries to merge or consolidate, with any other Person, or acquire, or permit any of its Subsidiaries to acquire, all or substantially all of the stock, partnership, membership, or other ownership interest or other equity securities or property of another Person (including, without limitation, by the formation of any Subsidiary or pursuant to a Division). A Subsidiary may merge or consolidate into another Subsidiary or into Borrower.

6.4 Indebtedness. Create, incur, assume, or be liable for any Indebtedness, or permit any Subsidiary to do so, other than Permitted Indebtedness.

6.5 Encumbrance. Create, incur, allow, or suffer to exist any Lien on any of its property, or assign or convey any right to receive income, including the sale of any Accounts, or permit any of its Subsidiaries to do so,

except for Permitted Liens, permit any Collateral not to be subject to the first priority security interest granted herein, or enter into any agreement, document, instrument or other arrangement (except with or in favor of Agent, for the ratable benefit of the Lenders) with any Person which directly or indirectly prohibits or has the effect of prohibiting Borrower or any Subsidiary from assigning, mortgaging, pledging, granting a security interest in or upon, or encumbering any of Borrower's or any Subsidiary's Intellectual Property, except as is otherwise permitted in Section 6.1 hereof and the definition of "Permitted Liens" herein.

6.6 Maintenance of Collateral Accounts. Maintain any Collateral Account except pursuant to the terms of Section 5.7.

6.7 Distributions; Investments. (a) Pay any dividends or make any distribution or payment or redeem, retire or purchase any stock, partnership, membership, or other ownership interest or other equity securities; provided that (i) Borrower may convert or exchange any of its convertible or exchangeable securities into other equity securities pursuant to the terms of such convertible or exchangeable securities or otherwise in exchange thereof and make cash payments in lieu of fractional shares in connection with any such conversions or exchanges, (ii) Borrower may pay dividends solely in common stock; and (iii) Borrower may repurchase the stock or other ownership interest or equity securities of current or former employees, directors, or consultants pursuant to stock repurchase agreements or similar agreements so long as an Event of Default does not exist at the time of such repurchase and would not exist after giving effect to such repurchase, provided that the aggregate amount of all such repurchases does not exceed Two Hundred Fifty Thousand Dollars (\$250,000) per fiscal year; or (b) directly or indirectly make any Investment (including, without limitation, by the formation of any Subsidiary) other than Permitted Investments, or permit any of its Subsidiaries to do so.

6.8 Transactions with Affiliates. Directly or indirectly enter into or permit to exist any material transaction with any Affiliate of Borrower, except for (a) transactions that are in the ordinary course of Borrower's business, upon fair and reasonable terms that are no less favorable to Borrower than would be obtained in an arm's length transaction with a non-affiliated Person and (b) customary compensation and other benefits arrangements (including retirement, health, stock option, and other benefit plans and indemnification arrangements approved by the relevant board of directors or equivalent corporate body) with Borrower's and its Subsidiaries' employees, officers, directors and consultants approved by Borrower's or such Subsidiary's Board of Directors.

6.9 Subordinated Debt. Except as expressly permitted under the terms of the subordination, intercreditor, or other similar agreement to which any Subordinated Debt is subject: (a) make or permit any payment on such Subordinated Debt; or (b) amend any provision in any document relating to such Subordinated Debt which would increase the amount thereof, provide for earlier or greater principal, interest, or other payments thereon, or adversely affect the subordination thereof to Obligations owed to Agent and the Lenders.

6.10 Compliance. (a) 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 U of the Board of Governors of the Federal Reserve System), or use the proceeds of any Credit Extension for that purpose; (b)(i) fail to meet the minimum funding requirements of ERISA, (ii) permit a Reportable Event or Prohibited Transaction, as defined in ERISA, to occur, (iii) fail to comply with the Federal Fair Labor Standards Act or (iv) violate any other applicable law or regulation, if the foregoing subclauses (i) through (iv), individually or in the aggregate, could reasonably be expected to have a material adverse effect on Borrower's business or operations, or permit any of its Subsidiaries to do so; or (c) withdraw or permit any Subsidiary to withdraw from participation in, permit partial or complete termination of, or permit the occurrence of any other event with respect to, any present pension, profit sharing and deferred compensation plan which could reasonably be expected to result in any liability of Borrower, including any liability to the Pension Benefit Guaranty Corporation or its successors or any other Governmental Authority.

6.11 Subsidiary Assets.

(a) Until such time (if any) as the Australian Subsidiary becomes a co-Borrower or secured Guarantor hereunder, permit the aggregate value of all assets (cash and non-cash) held by the Australian Subsidiary to exceed Five Hundred Thousand Dollars (\$500,000).

(b) Until such time (if any) as the Canadian Subsidiary becomes a co-Borrower or secured Guarantor hereunder, permit the aggregate value of all assets (cash and non-cash) held by the Canadian Subsidiary to exceed Five Hundred Thousand Dollars (\$500,000).

6.12 MSC Subsidiary. Permit any MSC Subsidiary to make any Investments or hold any assets that would cause such MSC Subsidiary to fail to qualify 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).

7 EVENTS OF DEFAULT

Any one of the following shall constitute an event of default (an “**Event of Default**”) under this Agreement:

7.1 Payment Default. Borrower fails to (a) make any payment of principal or interest on any Credit Extension on its due date, or (b) pay any other Obligations within three (3) Business Days after such Obligations are due and payable (which three (3) Business Day cure period shall not apply to payments due on the Term Loan Maturity Date). During the cure period, the failure to make or pay any payment specified under clause (b) hereunder is not an Event of Default (but no Credit Extension will be made during the cure period);

7.2 Covenant Default.

(a) Borrower fails or neglects to perform any obligation in Section 5 (other than Sections 5.2 (Government Compliance), 5.10 (Litigation Cooperation), 5.12 (Inventory; Returns) and 5.13 (Further Assurances)) or violates any covenant in Section 6; or

(b) Borrower fails or neglects to perform, keep, or observe any other term, provision, condition, covenant or agreement contained in this Agreement or any Loan Documents, and as to any default (other than those specified in this Section 7) under such other term, provision, condition, covenant or agreement that can be cured, has failed to cure the default within ten (10) days after the occurrence thereof; provided, however, that if the default cannot by its nature be cured within the ten (10) day period or cannot after diligent attempts by Borrower be cured within such ten (10) day period, and such default is likely to be cured within a reasonable time, then Borrower shall have an additional period (which shall not in any case exceed thirty (30) days) to attempt to cure such default, and within such reasonable time period the failure to cure the default shall not be deemed an Event of Default (but no Credit Extensions shall be made during such cure period). Cure periods provided under this section shall not apply, among other things, to financial covenants or any other covenants that are required to be satisfied, completed or tested by a date certain or any covenants set forth in clause (a) above;

7.3 Material Adverse Change. A Material Adverse Change occurs;

7.4 Attachment; Levy; Restraint on Business.

(a) (i) The service of process seeking to attach, by trustee or similar process, any funds of Borrower or any Subsidiary, or (ii) a notice of lien or levy is filed against any of Borrower’s or any of its Subsidiaries’ assets by any Governmental Authority, and the same under subclauses (i) and (ii) hereof are not, within ten (10) days after the occurrence thereof, discharged or stayed (whether through the posting of a bond or otherwise); provided, however, no Credit Extensions shall be made during any ten (10) day cure period; or

(b) (i) any material portion of Borrower’s or any of its Subsidiaries’ assets is attached, seized, levied on, or comes into possession of a trustee or receiver, or (ii) any court order enjoins, restrains, or prevents Borrower or any of its Subsidiaries from conducting all or any material part of its business;

7.5 Insolvency. (a) Borrower or any of its Subsidiaries is unable to pay its debts (including trade debts) as they become due or otherwise becomes insolvent; (b) Borrower or any of its Subsidiaries begins an Insolvency Proceeding; or (c) an Insolvency Proceeding is begun against Borrower or any of its Subsidiaries and is

not dismissed or stayed within thirty (30) days (but no Credit Extensions shall be made while any of the conditions described in clause (a) exist or until any Insolvency Proceeding is dismissed);

7.6 Other Agreements. There is, under any agreement to which Borrower, any of Borrower's Subsidiaries, or any Guarantor is a party with a third party or parties, (a) any default resulting in a right by such third party or parties, whether or not exercised, to accelerate the maturity of any Indebtedness in an amount individually or in the aggregate in excess of Five Hundred Thousand Dollars (\$500,000); or (b) any breach or default by Borrower, any of Borrower's Subsidiaries, or Guarantor, the result of which could have a material adverse effect on Borrower's, any of Borrower's Subsidiaries', or any Guarantor's business or operations;

7.7 Judgments; Penalties. One or more fines, penalties or final judgments, orders or decrees for the payment of money in an amount, individually or in the aggregate, of at least Five Hundred Thousand Dollars (\$500,000) (not covered by independent third-party insurance as to which liability has been accepted by such insurance carrier) shall be rendered against Borrower or any of its Subsidiaries by any Governmental Authority, and the same are not, within ten (10) Business Days after the entry, assessment or issuance thereof, discharged, or after execution thereof, or stayed pending appeal, or such judgments are not discharged prior to the expiration of any such stay (provided that no Credit Extensions will be made prior to the discharge, or stay of such fine, penalty, judgment, order or decree);

7.8 Misrepresentations. Borrower or any of its Subsidiaries or any Person acting for Borrower or any of its Subsidiaries makes any representation, warranty, or other statement now or later in this Agreement, any Loan Document or in any writing delivered to Agent or any Lender in connection with this Agreement, any Loan Document or the transactions contemplated hereby or to induce Agent or any Lender to enter this Agreement or any Loan Document, and such representation, warranty, or other statement is incorrect in any material respect when made (it being agreed and acknowledged by Agent and each Lender that the projections and forecasts provided by Borrower or any of its Subsidiaries in good faith and based upon reasonable assumptions are not viewed as facts and that actual results during the period or periods covered by such projections and forecasts may differ from the projected or forecasted results);

7.9 Subordinated Debt. If: (a) any document, instrument, or agreement evidencing any Subordinated Debt shall for any reason be revoked or invalidated or otherwise cease to be in full force and effect, or any Person (other than SVB) shall be in breach thereof or contest in any manner the validity or enforceability thereof or deny that it has any further liability or obligation thereunder; (b) a default or event of default (however defined) has occurred under any document, instrument, or agreement evidencing any Subordinated Debt, which default shall not have been cured or waived within any applicable grace period; or (c) the Obligations shall for any reason be subordinated or shall not have the priority contemplated by this Agreement or any applicable subordination or intercreditor agreement;

7.10 Guaranty. (a) Any guaranty of any Obligations terminates or ceases for any reason to be in full force and effect; (b) any Guarantor does not perform any obligation or covenant under any guaranty of the Obligations; (c) any circumstance described in Sections 7.3, 7.4, 7.5, 7.6, 7.7, or 7.8 of this Agreement occurs with respect to any Guarantor, (d) the death, liquidation, winding up, or termination of existence of any Guarantor; or (e)(i) a material impairment in the perfection or priority of Agent's Lien in the collateral provided by Guarantor or in the value of such collateral or (ii) a material adverse change in the general affairs, management, results of operation, condition (financial or otherwise) or the prospect of repayment of the Obligations occurs with respect to any Guarantor; or

7.11 Lien Priority. There is a material impairment in the perfection or priority of Agent's security interest in the Collateral; or

7.12 Governmental Approvals. Any Governmental Approval shall have been (a) revoked, rescinded, suspended, modified in an adverse manner or not renewed in the ordinary course for a full term or (b) subject to any decision by a Governmental Authority that designates a hearing with respect to any applications for renewal of any of such Governmental Approval or that could result in the Governmental Authority taking any of the actions described in clause (a) above, and such decision or such revocation, rescission, suspension, modification or non-renewal (i) causes, or could reasonably be expected to cause, a Material Adverse Change, or (ii) adversely affects

the legal qualifications of Borrower or any of its Subsidiaries to hold such Governmental Approval in any applicable jurisdiction and such revocation, rescission, suspension, modification or non-renewal could reasonably be expected to affect the status of or legal qualifications of Borrower or any of its Subsidiaries to hold any Governmental Approval in any other jurisdiction.

7.13 Delisting. Shares of Borrower's common stock are delisted from the Nasdaq stock exchange because of Borrower's failure to comply with continued listing standards thereof or due to a voluntary delisting which results in such shares not being listed on such exchange or market.

8 RIGHTS AND REMEDIES

8.1 Rights and Remedies. Upon the occurrence and during the continuance of an Event of Default, Agent, as directed by Lenders in accordance with the Lender Intercreditor Agreement or, if such rights and remedies are not addressed in the Lender Intercreditor Agreement, as directed by Lenders having a majority of the Obligations, may, without notice or demand, do any or all of the following:

(a) declare all Obligations immediately due and payable (but if an Event of Default described in Section 7.5 occurs all Obligations are immediately due and payable without any action by Agent or any Lender);

(b) stop advancing money or extending credit for Borrower's benefit under this Agreement or under any other agreement among Borrower, Agent and/or any Lenders;

(c) demand that Borrower (i) deposit cash with SVB in an amount equal to at least (A) one hundred and five percent (105.0%) of the aggregate face amount of any Letters of Credit denominated in Dollars remaining undrawn, and (B) one hundred and ten percent (110.0%) of the Dollar Equivalent of the aggregate face amount of any Letters of Credit denominated in a Foreign Currency remaining undrawn (plus, in each case, all interest, fees, and costs due or estimated by SVB to become due in connection therewith), to secure all of the Obligations relating to such Letters of Credit, as collateral security for the repayment of any future drawings under such Letters of Credit, and Borrower shall forthwith deposit and pay such amounts, and (ii) pay in advance all letter of credit fees scheduled to be paid or payable over the remaining term of any Letters of Credit;

(d) terminate any FX Contracts (it being understood and agreed that (i) SVB is not obligated to deliver the currency which Borrower has contracted to receive under any FX Contract, and SVB may cover its exposure for any FX Contracts by purchasing or selling currency in the interbank market as SVB deems appropriate; (ii) Borrower shall be liable for all losses, damages, costs, margin obligations and expenses incurred by SVB arising from Borrower's failure to satisfy its obligations under any FX Contract or the execution of any FX Contract; and (iii) SVB shall not be liable to Borrower for any gain in value of a FX Contract that SVB may obtain in covering Borrower's breach);

(e) verify the amount of, demand payment of and performance under, and collect any Accounts and General Intangibles, settle or adjust disputes and claims directly with Account Debtors for amounts on terms and in any order that Agent and/or the Lenders consider advisable, and notify any Person owing Borrower money of Agent's security interest in such funds;

(f) make any payments and do any acts Agent or any Lender considers necessary or reasonable to protect the Collateral and/or its security interest in the Collateral. Borrower shall assemble the Collateral if Agent requests and make it available as Agent designates at a location reasonably convenient to Agent and Borrower. Agent may enter premises where the Collateral is located, take and maintain possession of any part of the Collateral, and pay, purchase, contest, or compromise any Lien which appears to be prior or superior to its security interest and pay all expenses incurred. Borrower grants Agent a license to enter and occupy any of its premises, without charge, to exercise any of Agent's rights or remedies;

(g) apply to the Obligations then due (including any Obligations accelerated by Bank in accordance with its rights as a secured creditor hereunder and under the Code) any (i) balances and deposits of Borrower it holds, or (ii) any amount held by Agent owing to or for the credit or the account of Borrower;

(h) ship, reclaim, recover, store, finish, maintain, repair, prepare for sale, advertise for sale, and sell the Collateral. For use solely upon the occurrence and during the continuation of an Event of Default, Agent, for the benefit of the Lenders, is hereby granted a non-exclusive, royalty-free license or other right to use, without charge, Borrower's labels, Patents, Copyrights, mask works, rights of use of any name, trade secrets, trade names, Trademarks, and advertising matter, or any similar property as it pertains to the Collateral, in completing production of, advertising for sale, and selling any Collateral and, in connection with Agent's exercise of its rights under this Section 8.1, Borrower's rights under all licenses and all franchise agreements inure to Agent, for the ratable benefit of the Lenders;

(i) place a "hold" on any account maintained with Agent or Lenders and/or deliver a notice of exclusive control, any entitlement order, or other directions or instructions pursuant to any Control Agreement or similar agreements providing control of any Collateral;

(j) demand and receive possession of Borrower's Books; and

(k) exercise all rights and remedies available to Agent and the Lenders under the Loan Documents or at law or equity, including all remedies provided under the Code or any Applicable Law (including disposal of the Collateral pursuant to the terms thereof).

8.2 Power of Attorney. Borrower hereby irrevocably appoints Agent, for the benefit of the Lenders, as its true and lawful attorney-in-fact, (a) exercisable upon the occurrence and during the continuance of an Event of Default, to: (i) endorse Borrower's name on any checks, payment instruments, or other forms of payment or security; (ii) sign Borrower's name on any invoice or bill of lading for any Account or drafts against Account Debtors; (iii) 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 chooses); (iv) make, settle, and adjust all claims under Borrower's insurance policies; (v) 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; and (vi) transfer the Collateral into the name of Agent or a third party as the Code permits; and (b) regardless of whether an Event of Default has occurred, to sign Borrower's name on any documents necessary to perfect or continue the perfection of Agent's security interest in the Collateral. 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 such time as all Obligations (other than inchoate indemnity obligations) have been satisfied in full, Agent is under no further obligation to make Credit Extensions and the Loan Documents have been terminated. Agent shall not incur any liability in connection with or arising from the exercise of such power of attorney and shall have no obligation to exercise any of the foregoing rights and remedies.

8.3 Protective Payments. If Borrower fails to obtain the insurance called for by Section 5.6 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 Lenders' Expenses and immediately due and payable, bearing interest at the then highest rate applicable to the 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 or any Lender's waiver of any Event of Default.

8.4 Application of Payments and Proceeds. Agent may apply any funds in its possession, whether from Borrower account balances, payments, proceeds realized as the result of any collection of Accounts or other disposition of the Collateral, or otherwise, to the Obligations in such order as Agent shall determine in its sole discretion. Any surplus shall be paid to Borrower or other Persons legally entitled thereto; Borrower shall remain liable to Agent and the Lenders for any deficiency. If Agent, in its commercially reasonable discretion, directly or indirectly, enters into a deferred payment or other credit transaction with any purchaser at any sale of Collateral, Agent shall have the option, exercisable at any time, of either reducing the Obligations by the principal amount of the purchase price or deferring the reduction of the Obligations until the actual receipt by Agent of cash therefor.

8.5 Liability for Collateral. Agent's and Lenders' sole duty with respect to the custody, safekeeping and physical preservation of the Collateral in their possession or under the control of Agent and/or Lenders, under Section 9-207 of the Code or otherwise, shall be to deal with it in the same manner as Agent and/or Lenders deal with their own property consisting of similar instruments or interests. Borrower bears all risk of loss, damage or destruction of the Collateral.

8.6 No Waiver; Remedies Cumulative. Agent's and any Lender's failure, at any time or times, to require strict performance by Borrower of any provision of this Agreement or any other Loan Document shall not waive, affect, or diminish any right of Agent or any Lender thereafter to demand strict performance and compliance herewith or therewith. No waiver hereunder shall be effective unless signed by the party granting the waiver and then is only effective for the specific instance and purpose for which it is given. Agent's and each Lender's rights and remedies under this Agreement and the other Loan Documents are cumulative. Agent and each Lender have all rights and remedies provided under the Code, by law, or in equity. Agent's or any Lender's exercise of one right or remedy is not an election and shall not preclude Agent or any Lender from exercising any other remedy under this Agreement or other remedy available at law or in equity, and Agent's or any Lender's waiver of any Event of Default is not a continuing waiver. Agent's or any Lender's delay in exercising any remedy is not a waiver, election, or acquiescence.

8.7 Demand Waiver. 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.

9 AGENT

9.1 Appointment and Authority.

(a) Each Lender hereby irrevocably appoints SVB to act on its behalf as Agent hereunder and under the other Loan Documents and authorizes Agent to take such actions on its behalf and to exercise such powers as are delegated to Agent by the terms hereof or thereof, together with such actions and powers as are reasonably incidental thereto.

(b) The provisions of this Section 9 are solely for the benefit of Agent and Lenders, and Borrower shall not have rights as a third-party beneficiary of any of such provisions. Notwithstanding any provision to the contrary elsewhere in this Agreement, Agent shall not have any duties or responsibilities to any Lender or any other Person, except those expressly set forth herein, or any fiduciary relationship with any Lender, and no implied covenants, functions, responsibilities, duties, obligations or liabilities shall be read into this Agreement or any other Loan Document or otherwise exist against Agent.

9.2 Delegation of Duties. Agent may perform any and all of its duties and exercise its rights and powers hereunder or under any other Loan Document by or through any one or more sub-agents appointed by Agent. Agent and any such sub-agent may perform any and all of its duties and exercise its rights and powers by or through their respective Indemnified Persons. The exculpatory provisions of this Section 9.2 shall apply to any such sub-agent and to the Indemnified Persons of Agent and any such sub-agent, and shall apply to their respective activities in connection with the syndication of the credit facilities provided for herein as well as activities as Agent.

9.3 Exculpatory Provisions. Agent shall have no duties or obligations except those expressly set forth herein and in the other Loan Documents. Without limiting the generality of the foregoing, Agent shall not:

(a) be subject to any fiduciary, trust, agency or other similar duties, regardless of whether any Event of Default has occurred and is continuing;

(b) have any duty to take any discretionary action or exercise any discretionary powers, except discretionary rights and powers expressly contemplated hereby or by the other Loan Documents that Agent is required to exercise as directed in writing by the Lenders, as applicable; provided that Agent shall not be required to

take any action that, in its opinion or the opinion of its counsel, may expose Agent to liability or that is contrary to any Loan Document or applicable law; and

(c) except as expressly set forth herein and in the other Loan Documents, have any duty to disclose, and Agent shall not be liable for the failure to disclose, any information relating to Borrower or any of its Affiliates that is communicated to or obtained by any Person serving as Agent or any of its Affiliates in any capacity.

Agent shall not be liable for any action taken or not taken by it (i) with the consent or at the request of the Lenders (or as Agent shall believe in good faith shall be necessary, under the circumstances as provided in Section 12.7) or (ii) in the absence of its own gross negligence or willful misconduct.

Agent shall not be responsible for or have any duty to ascertain or inquire into (i) any statement, warranty or representation made in or in connection with this Agreement or any other Loan Document, (ii) the contents of any certificate, report or other document delivered hereunder or thereunder or in connection herewith or therewith, (iii) the performance or observance of any of the covenants, agreements or other terms or conditions set forth herein or therein or the occurrence of any Event of Default, (iv) the validity, enforceability, effectiveness or genuineness of this Agreement, any other Loan Document or any other agreement, instrument or document or (v) the satisfaction of any condition set forth in Section 2 or elsewhere herein, other than to confirm receipt of items expressly required to be delivered to Agent.

9.4 Reliance by Agent. Agent shall be entitled to rely upon, and shall not incur any liability for relying upon, any notice, request, certificate, consent, statement, instrument, document or other writing (including any electronic message, internet or intranet website posting or other distribution) believed by it to be genuine and to have been signed, sent or otherwise authenticated by the proper Person. Agent also may rely upon any statement made to it orally or by telephone and believed by it to have been made by the proper Person, and shall not incur any liability for relying thereon. Agent may consult with legal counsel (who may be counsel for Borrower), independent accountants and other experts selected by it, and shall not be liable for any action taken or not taken by it in accordance with the advice of any such counsel, accountants or experts. In determining compliance with any condition hereunder to the making of a Credit Extension that, by its terms, must be fulfilled to the satisfaction of a Lender, Agent may presume that such condition is satisfactory to such Lender unless Agent shall have received notice to the contrary from such Lender prior to the making of such Credit Extension. Agent shall in all cases be fully protected in acting, or in refraining from acting, under this Agreement and the other Loan Documents in accordance with a request of the Lenders, and such request and any action taken or failure to act pursuant thereto shall be binding upon Lenders and all future holders of the Credit Extensions.

9.5 Notice of Default. Agent shall not be deemed to have knowledge or notice of the occurrence of any Event of Default (except with respect to defaults in the payment of principal, interest or fees required to be paid to Agent for the account of Lenders), unless Agent has received notice from a Lender or Borrower referring to this Agreement, describing such Event of Default and stating that such notice is a "notice of default". In the event that Agent receives such a notice, Agent shall give notice thereof to Lenders. Agent shall take such action with respect to such Event of Default as shall be reasonably directed by the Lenders.

9.6 Non-Reliance on Agent and Other Lenders. Each Lender expressly acknowledges that neither Agent nor any of its officers, directors, employees, agents, attorneys in fact or affiliates has made any representations or warranties to it and that no act by Agent hereafter taken, including any review of the affairs of a Group Member or any Affiliate of a Group Member, shall be deemed to constitute any representation or warranty by Agent to any Lender. Each Lender represents to Agent that it has, independently and without reliance upon Agent or any other Lender, and based on such documents and information as it has deemed appropriate, made its own appraisal of, and investigation into, the business, operations, property, financial and other condition and creditworthiness of the Group Members and their Affiliates and made its own decision to make its Credit Extensions hereunder and enter into this Agreement. Each Lender also represents that it will, independently and without reliance upon Agent or any other Lender, and based on such documents and information as it shall deem appropriate at the time, continue to make its own credit analysis, appraisals and decisions in taking or not taking action under this Agreement and the other Loan Documents, and to make such investigation as it deems necessary to inform itself as to the business, operations, property, financial and other condition and creditworthiness of the Group Members

and their Affiliates. Except for notices, reports and other documents expressly required to be furnished to Lenders by Agent hereunder, Agent shall have no duty or responsibility to provide any Lender with any credit or other information concerning the business, operations, property, condition (financial or otherwise), prospects or creditworthiness of any Group Member or any Affiliate of a Group Member that may come into the possession of Agent or any of its officers, directors, employees, agents, attorneys in fact or Affiliates.

9.7 Indemnification. Each Lender agrees to indemnify Agent in its capacity as such (to the extent not reimbursed by Borrower and without limiting the obligation of Borrower to do so in accordance with the terms hereof, according to its Term Loan Commitment Percentage in effect on the date on which indemnification is sought under this Section 9.7 (or, if indemnification is sought after the date upon which the Commitments shall have terminated and the Obligations shall have been paid in full, in accordance with its Term Loan Commitment Percentage immediately prior to such date), from and against any and all liabilities, obligations, losses, damages, penalties, actions, judgments, suits, costs, expenses or disbursements of any kind whatsoever that may at any time (whether before or after the payment of the Credit Extensions) be imposed on, incurred by or asserted against Agent in any way relating to or arising out of, the Commitments, this Agreement, any of the other Loan Documents or any documents contemplated by or referred to herein or therein or the transactions contemplated hereby or thereby or any action taken or omitted by Agent under or in connection with any of the foregoing; provided that no Lender shall be liable for the payment of any portion of such liabilities, obligations, losses, damages, penalties, actions, judgments, suits, costs, expenses or disbursements that are found by a final and non-appealable decision of a court of competent jurisdiction to have resulted primarily from Agent's gross negligence or willful misconduct. The agreements in this Section shall survive the payment of the Credit Extensions and all other amounts payable hereunder.

9.8 Agent in Its Individual Capacity. The Person serving as Agent hereunder shall have the same rights and powers in its capacity as a Lender as any other Lender and may exercise the same as though it were not Agent and the term "Lender" or "Lenders" shall, unless otherwise expressly indicated or unless the context otherwise requires, include each such Person serving as Agent hereunder in its individual capacity. Such Person and its Affiliates may accept deposits from, lend money to, act as the financial advisor or in any other advisory capacity for and generally engage in any kind of business with Borrower, any Guarantor or any Subsidiary or other Affiliate thereof as if such Person were not Agent hereunder and without any duty to account therefor to Lenders.

9.9 Successor Agent. Agent may at any time give notice of its resignation to Lenders and Borrower, which resignation shall not be effective until the time at which the majority of the Lenders have delivered to Agent their written consent to such resignation. Upon receipt of any such notice of resignation, the Lenders shall have the right, in consultation with Borrower, to appoint a successor, which shall be a financial institution with an office in the State of California, or an Affiliate of any such bank with an office in the State of California. If no such successor shall have been so appointed by the Lenders and shall have accepted such appointment within thirty (30) days after the retiring Agent has received the written consent of the majority of the Lenders to such resignation, then the retiring Agent may on behalf of Lenders, appoint a successor Agent meeting the qualifications set forth above; provided that in no event shall any such successor Agent be a Defaulting Lender and provided further that if the retiring Agent shall notify Borrower and Lenders that no qualifying Person has accepted such appointment, then such resignation shall nonetheless become effective in accordance with such notice and (1) the retiring Agent shall be discharged from its duties and obligations hereunder and under the other Loan Documents (except that in the case of any collateral security held by Agent on behalf of the Lenders under any of the Loan Documents, the retiring Agent shall continue to hold such collateral security until such time as a successor Agent is appointed and such collateral security is assigned to such successor Agent) and (2) all payments, communications and determinations provided to be made by, to or through Agent shall instead be made by or to each Lender directly, until such time as the Lenders appoint a successor Agent as provided for above in this Section 9.9. Upon the acceptance of a successor's appointment as Agent hereunder, such successor shall succeed to and become vested with all of the rights, powers, privileges and duties of the retiring (or retired) Agent, and the retiring Agent shall be discharged from all of its duties and obligations hereunder or under the other Loan Documents (if not already discharged therefrom as provided above in this Section 9.9). The fees payable by Borrower to a successor Agent shall be the same as those payable to its predecessor unless otherwise agreed between Borrower and such successor. After the retiring Agent's resignation hereunder and under the other Loan Documents, the provisions of this Section 9 shall continue in effect for the benefit of such retiring Agent, its sub-agents and their respective Indemnified Persons in respect of any actions taken or omitted to be taken by any of them while the retiring Agent was acting as Agent.

(a) Defaulting Lender Adjustments. Notwithstanding anything to the contrary contained in this Agreement, if any Lender becomes a Defaulting Lender, then, until such time as such Lender is no longer a Defaulting Lender, to the extent permitted by applicable law:

(i) Waivers and Amendments. Such Defaulting Lender's right to approve or disapprove any amendment, waiver or consent with respect to this Agreement shall be restricted as long as said Lender is a Defaulting Lender.

(ii) Defaulting Lender Waterfall. Any payment of principal, interest, fees or other amounts received by the Agent for the account of such Defaulting Lender (whether voluntary or mandatory, at maturity, pursuant to Section 7 or otherwise, and including any amounts made available to the Agent by such Defaulting Lender pursuant to Section 12.10), shall be applied at such time or times as may be determined by the Agent as follows: first, to the payment of any amounts owing by such Defaulting Lender to the Agent hereunder; second, as Borrower may request (so long as no Event of Default exists), to the funding of any Term Loan Advance in respect of which such Defaulting Lender has failed to fund its portion thereof as required by this Agreement, as determined by the Agent; third, if so determined by the Agent and Borrower, to be held in a Deposit Account and released pro rata to satisfy such Defaulting Lender's potential future funding obligations with respect to Term Loan Advances under this Agreement; fourth, so long as no Event of Default has occurred and is continuing, to the payment of any amounts owing to Borrower as a result of any judgment of a court of competent jurisdiction obtained by Borrower against such Defaulting Lender as a result of such Defaulting Lender's breach of its obligations under this Agreement; and fifth, to such Defaulting Lender or as otherwise directed by a court of competent jurisdiction; provided that if (A) such payment is a payment of the principal amount of any Term Loan Advances in respect of which such Defaulting Lender has not fully funded its appropriate share and (B) such Term Loan Advances were made at a time when the conditions set forth in Section 2.1 were satisfied or waived, such payment shall be applied solely to pay the Term Loan Advance of all non-Defaulting Lenders on a *pro rata* basis prior to being applied to the payment of any Term Loan Advances of such Defaulting Lender until such time as all Term Loan Advances are held by the Lenders pro rata in accordance with the Term Loan Commitments under this Agreement. Any payments, prepayments or other amounts paid or payable to a Defaulting Lender that are applied (or held) to pay amounts owed by a Defaulting Lender pursuant to this Section 9.10(a)(ii) shall be deemed paid to and redirected by such Defaulting Lender, and each Lender irrevocably consents hereto.

(iii) Certain Fees. No Defaulting Lender shall be entitled to receive any fee pursuant to Section 1.3(b) for any period during which such Lender is a Defaulting Lender (and Borrower shall not be required to pay any such fee that otherwise would have been required to have been paid to such Defaulting Lender).

(b) Defaulting Lender Cure. If Borrower and Agent agree in writing that a Lender is no longer a Defaulting Lender, Agent will so notify the parties hereto, whereupon as of the effective date specified in such notice and subject to any conditions set forth therein, such Lender will, to the extent applicable, purchase at par that portion of outstanding Term Loan Advances of the other Lenders or take such other actions as Agent may determine to be necessary to cause the Term Loan Advances to be held on a *pro rata* basis by the Lenders in accordance with their respective Term Loan Commitment Percentages, whereupon such Lender will cease to be a Defaulting Lender; provided that no adjustments will be made retroactively with respect to fees accrued or payments made by or on behalf of Borrower while such Lender was a Defaulting Lender; and provided further that, except to the extent otherwise expressly agreed by the affected parties, no change hereunder from Defaulting Lender to Lender will constitute a waiver or release of any claim of any party hereunder arising from such Lender having been a Defaulting Lender.

(c) Termination of Defaulting Lender. Borrower may terminate the unused amount of the Term Loan Commitment of any Lender that is a Defaulting Lender upon not less than ten (10) Business Days' prior notice to Agent (which shall promptly notify the Lenders thereof), and in such event the provisions of Section 9.10(a)(ii) will apply to all amounts thereafter paid by Borrower for the account of such Defaulting Lender under this Agreement (whether on account of principal, interest, fees, indemnity or other amounts); provided that (i) no Event of Default shall have occurred and be continuing, and (ii) such termination shall not be deemed to be a waiver or release of any claim Borrower, Agent or any Lender may have against such Defaulting Lender.

(d) If the Person serving as Agent is a Defaulting Lender pursuant to clause (d) of the definition thereof, the non-Defaulting Lenders may, to the extent permitted by applicable law, by notice in writing to Borrower and such Person, remove such Person as Agent and, in consultation with Borrower, appoint a successor. If no such successor shall have been so appointed by the non-Defaulting Lenders and shall have accepted such appointment within thirty (30) days (or such earlier day as shall be agreed by the non-Defaulting Lenders) (the "**Removal Effective Date**"), then such removal shall nonetheless become effective in accordance with such notice on the Removal Effective Date.

9.11 Erroneous Payments.

(a) If the Agent notifies a Lender or any Person who has received funds on behalf of a Lender (any such Lender or other recipient, a "**Payment Recipient**") that the Agent has determined in its sole discretion (whether or not after receipt of any notice under immediately succeeding clause (b)) that any funds received by such Payment Recipient from the Agent or any of its Affiliates were erroneously transmitted to, or otherwise erroneously or mistakenly received by, such Payment Recipient (whether or not known to such Lender or other Payment Recipient on its behalf) (any such funds, whether received as a payment, prepayment or repayment of principal, interest, fees, distribution or otherwise, individually and collectively, an "**Erroneous Payment**") and demands the return of such Erroneous Payment (or a portion thereof), such Erroneous Payment shall at all times remain the property of the Agent and shall be segregated by the Payment Recipient and held in trust for the benefit of the Agent, and such Lender (or, with respect to any Payment Recipient who received such funds on its behalf, shall cause such Payment Recipient to) promptly, but in no event later than two Business Days thereafter, return to the Agent the amount of any such Erroneous Payment (or portion thereof) as to which such a demand was made, in same day funds (in the currency so received), together with interest thereon in respect of each day from and including the date such Erroneous Payment (or portion thereof) was received by such Payment Recipient to the date such amount is repaid to the Agent in same day funds at the greater of the Federal Funds Effective Rate and a rate determined by the Agent in accordance with banking industry rules on interbank compensation from time to time in effect. A notice of the Agent to any Payment Recipient under this clause (a) shall be conclusive, absent manifest error.

(b) Without limiting immediately preceding clause (a), each Lender or any Person who has received funds on behalf of a Lender, hereby further agrees that if it receives a payment, prepayment or repayment (whether received as a payment, prepayment or repayment of principal, interest, fees, distribution or otherwise) from the Agent (or any of its Affiliates) (x) that is in a different amount than, or on a different date from, that specified in a notice of payment, prepayment or repayment sent by the Agent (or any of its Affiliates) with respect to such payment, prepayment or repayment, (y) that was not preceded or accompanied by a notice of payment, prepayment or repayment sent by the Agent (or any of its Affiliates), or (z) that such Lender or other such recipient, otherwise becomes aware was transmitted, or received, in error or by mistake (in whole or in part) in each case:

(A) (i) (1) in the case of immediately preceding clauses (x) or (y), an error shall be presumed to have been made (absent written confirmation from the Agent to the contrary) or (2) an error has been made (in the case of immediately preceding clause (z)), in each case, with respect to such payment, prepayment or repayment; and

(B) such Lender shall (and shall cause any other recipient that receives funds on its respective behalf to) promptly (and, in all events, within one Business Day of its knowledge of such error) notify the Agent of its receipt of such payment, prepayment or repayment, the details thereof (in reasonable detail) and that it is so notifying the Agent pursuant to this Section 9.11(b).

(c) Each Lender hereby authorizes the Agent to set off, net and apply any and all amounts at any time owing to such Lender under any Loan Document, or otherwise payable or distributable by the Agent to such Lender from any source, against any amount due to the Agent under clause (a) hereof or under the indemnification provisions of this Agreement.

(d) In the event that an Erroneous Payment (or portion thereof) is not recovered by the Agent for any reason, after demand therefor by the Agent in accordance with clause (a) hereof, from any Lender that has received such Erroneous Payment (or portion thereof) (and/or from any Payment Recipient who received such Erroneous Payment (or portion thereof) on its respective behalf) (such unrecovered amount, an “**Erroneous Payment Return Deficiency**”), upon the Agent’s notice to such Lender at any time, (i) such Lender shall be deemed to have assigned all Obligations owing from Borrower to such Lender hereunder (but not its Term Loan Commitments) with respect to which such Erroneous Payment was made in an amount equal to the Erroneous Payment Return Deficiency (or such lesser amount as the Agent may specify) (such assignment of the Loans (but not Commitments), the “**Erroneous Payment Deficiency Assignment**”) at par plus any accrued and unpaid interest (with the assignment fee to be waived by the Agent in such instance), and is hereby (together with the Borrower) deemed to execute and deliver an Assignment and Assumption with respect to such Erroneous Payment Deficiency Assignment, and such Lender shall deliver any promissory notes (if any) evidencing such Obligations to the Borrower or the Agent, (ii) the Agent as the assignee Lender shall be deemed to acquire the Erroneous Payment Deficiency Assignment, (iii) upon such deemed acquisition, the Agent as the assignee Lender shall become a Lender, hereunder with respect to such Erroneous Payment Deficiency Assignment and the assigning Lender shall cease to be a Lender hereunder with respect to such Erroneous Payment Deficiency Assignment, excluding, for the avoidance of doubt, its obligations under the indemnification provisions of this Agreement and its applicable Term Loan Commitments which shall survive as to such assigning Lender, and (iv) the Agent may reflect in the register (if any) its ownership interest in the Obligations subject to the Erroneous Payment Deficiency Assignment. The Agent may, in its discretion, sell any Obligations acquired pursuant to an Erroneous Payment Deficiency Assignment and upon receipt of the proceeds of such sale, the Erroneous Payment Return Deficiency owing by the applicable Lender shall be reduced by the net proceeds of the sale of such portion of the Obligations, and the Agent shall retain all other rights, remedies and claims against such Lender (and/or against any recipient that receives funds on its respective behalf). For the avoidance of doubt, no Erroneous Payment Deficiency Assignment will reduce the Term Loan Commitments of any Lender and such Term Loan Commitments shall remain available in accordance with the terms of this Agreement. In addition, each party hereto agrees that, except to the extent that the Agent has sold any portion of the Obligations acquired pursuant to an Erroneous Payment Deficiency Assignment, and irrespective of whether the Agent may be equitably subrogated, the Agent shall be contractually subrogated to all the rights and interests of the applicable Lender under the Loan Documents with respect to each Erroneous Payment Return Deficiency (the “**Erroneous Payment Subrogation Rights**”).

(e) The parties hereto agree that an Erroneous Payment shall not pay, prepay, repay, discharge or otherwise satisfy any Obligations owed by the Borrower or any Guarantor, except, in each case, to the extent such Erroneous Payment is, and solely with respect to the amount of such Erroneous Payment that is, comprised of funds received by the Agent from the Borrower or any Guarantor for the purpose of making such Erroneous Payment.

(f) To the extent permitted by applicable law, no Payment Recipient shall assert any right or claim to an Erroneous Payment, and hereby waives, and is deemed to waive, any claim, counterclaim, defense or right of set-off or recoupment with respect to any demand, claim or counterclaim by the Agent for the return of any Erroneous Payment received, including without limitation any defense based on “discharge for value” or any similar doctrine

(g) Each party’s obligations, agreements and waivers under this Section 9.11 shall survive the resignation or replacement of the Agent, any transfer of rights or obligations by, or the replacement of, a Lender, the termination of the Term Loan Commitments and/or the repayment, satisfaction or discharge of all Obligations (or any portion thereof) under any Loan Document.

All notices, consents, requests, approvals, demands, or other communication by any party to this Agreement or any other Loan Document must be in writing and shall be deemed to have been validly served, given, or delivered: (a) upon the earlier of actual receipt and three (3) Business Days after deposit in the U.S. mail, first class, registered or certified mail return receipt requested, with proper postage prepaid; (b) upon transmission, when sent by electronic mail; (c) one (1) Business Day after deposit with a reputable overnight courier with all charges prepaid; or (d) when delivered, if hand-delivered by messenger, all of which shall be addressed to the party to be notified and sent to the address or email address indicated below; provided that, for clause (b), if such notice, consent, request, approval, demand or other communication is not sent during the normal business hours of the recipient, it shall be deemed to have been sent at the opening of business on the next Business Day of the recipient. Agent or Borrower may change its mailing or electronic mail address by giving the other party written notice thereof in accordance with the terms of this Section 10.

If to Borrower:

AVROBIO, Inc.
One Kendall Square
Building 300, Suite 201
Cambridge, MA 02139
Attn: Erik Ostrowski

with a copy to (which shall not constitute notice):

Goodwin Procter LLP (US)
100 Northern Avenue
Boston, MA 02210
Attn: Mark D. Smith

If to Agent or SVB:

Silicon Valley Bank
275 Grove Street, Suite 2-200
Newton, MA 02466
Attn: Lauren Cole

with a copy to (which shall not constitute notice):

DLA Piper LLP (US)
401 B Street, Suite 1700
San Diego, CA 92101
Attn: Laurie E. Hutchins, Esq.

If to SVB Capital:

SVB Innovation Credit Fund VIII, L.P.
c/o SVB Capital
2770 Sand Hill Road
Menlo Park, CA 94025
Attn: SVB Capital Finance and Operations

11 CHOICE OF LAW, VENUE AND JURY TRIAL WAIVER; JUDICIAL REFERENCE

Except as otherwise expressly provided in any of the Loan Documents, California law governs the Loan Documents without regard to principles of conflicts of law that would require the application of the laws of another jurisdiction. Borrower, Agent, and Lenders each irrevocably and unconditionally submit to the exclusive jurisdiction of the State and Federal courts in Santa Clara County, California; provided, however, that nothing in this Agreement shall be deemed to operate to preclude Agent or Lenders from bringing suit or taking other legal action in any other jurisdiction with respect to the Loan Documents or to realize on the Collateral or any other security for the Obligations, or to enforce a judgment or other court order in favor of Agent or any Lender. Borrower expressly, irrevocably and unconditionally submits and consents in advance to such jurisdiction in any action or suit commenced in any such court, and Borrower hereby irrevocably and unconditionally waives, to the fullest extent

permitted by Applicable Law, any objection that it may have based upon lack of personal jurisdiction, improper venue, or forum non conveniens and hereby irrevocably and unconditionally consents to the granting of such legal or equitable relief as is deemed appropriate by such court. Borrower hereby waives personal service of the summons, complaints, and other process issued in such action or suit and agrees that service of such summons, complaints, and other process may be made by registered or certified mail addressed to Borrower at the address set forth in, or subsequently provided by Borrower in accordance with, Section 10 of this Agreement and that service so made shall be deemed completed upon the earlier to occur of Borrower's actual receipt thereof or three (3) days after deposit in the U.S. mails, proper postage prepaid.

TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, BORROWER, AGENT AND EACH LENDER EACH WAIVES THEIR RIGHT TO A JURY TRIAL OF ANY CLAIM OR CAUSE OF ACTION ARISING OUT OF OR BASED UPON THIS AGREEMENT, THE LOAN DOCUMENTS OR ANY CONTEMPLATED TRANSACTION, INCLUDING CONTRACT, TORT, BREACH OF DUTY AND ALL OTHER CLAIMS. THIS WAIVER IS A MATERIAL INDUCEMENT FOR THE PARTIES HERETO TO ENTER INTO THIS AGREEMENT. EACH PARTY HERETO HAS REVIEWED THIS WAIVER WITH ITS COUNSEL.

WITHOUT INTENDING IN ANY WAY TO LIMIT THE PARTIES' AGREEMENT TO WAIVE THEIR RESPECTIVE RIGHT TO A TRIAL BY JURY, if the above waiver of the right to a trial by jury is not enforceable, the parties hereto agree that any and all disputes or controversies of any nature between them arising at any time shall be decided by a reference to a private judge, mutually selected by the parties (or, if they cannot agree, by the Presiding Judge of the Santa Clara County, California Superior Court) appointed in accordance with California Code of Civil Procedure Section 638 (or pursuant to comparable provisions of federal law if the dispute falls within the exclusive jurisdiction of the federal courts), sitting without a jury, in Santa Clara County, California; and the parties hereby submit to the jurisdiction of such court. The reference proceedings shall be conducted pursuant to and in accordance with the provisions of California Code of Civil Procedure Sections 638 through 645.1, inclusive. The private judge shall have the power, among others, to grant provisional relief, including without limitation, entering temporary restraining orders, issuing preliminary and permanent injunctions and appointing receivers. All such proceedings shall be closed to the public and confidential and all records relating thereto shall be permanently sealed. If during the course of any dispute, a party desires to seek provisional relief, but a judge has not been appointed at that point pursuant to the judicial reference procedures, then such party may apply to the Santa Clara County, California Superior Court for such relief. The proceeding before the private judge shall be conducted in the same manner as it would be before a court under the rules of evidence applicable to judicial proceedings. The parties shall be entitled to discovery which shall be conducted in the same manner as it would be before a court under the rules of discovery applicable to judicial proceedings. The private judge shall oversee discovery and may enforce all discovery rules and orders applicable to judicial proceedings in the same manner as a trial court judge. The parties agree that the selected or appointed private judge shall have the power to decide all issues in the action or proceeding, whether of fact or of law, and shall report a statement of decision thereon pursuant to California Code of Civil Procedure Section 644(a). Nothing in this paragraph shall limit the right of any party at any time to exercise self-help remedies, foreclose against collateral, or obtain provisional remedies. The private judge shall also determine all issues relating to the applicability, interpretation, and enforceability of this paragraph.

This Section 11 shall survive the termination of this Agreement and the repayment of all Obligations.

12 GENERAL PROVISIONS

12.1 Termination Prior to the Term Loan Maturity Date; Survival. All covenants, representations and warranties made in this Agreement shall continue in full force until this Agreement has terminated pursuant to its terms and all Obligations (other than inchoate indemnity obligations) have been satisfied. So long as Borrower has satisfied the Obligations (other than inchoate indemnity obligations, any other obligations which, by their terms, are to survive the termination of this Agreement and the repayment of all Obligations, and any Obligations under Bank Services Agreements that are cash collateralized in accordance with Section 3.1 of this Agreement), this Agreement may be terminated prior to the Term Loan Maturity Date by Borrower pursuant to Section 1.1(c) of this Agreement. Those obligations that are expressly specified in this Agreement as surviving this Agreement's termination and the repayment of all Obligations shall continue to survive notwithstanding this Agreement's termination and the repayment of all Obligations.

12.2 Successors and Assigns. This Agreement binds and is for the benefit of the successors and permitted assigns of each party. Borrower may not assign or transfer this Agreement or any rights or obligations under it without Agent and Lenders' prior written consent (which may be granted or withheld in Agent's and Lenders' sole discretion) and any other attempted assignment or transfer by Borrower shall be null and void. Agent and each Lender has the right, without the consent of or notice to Borrower, to sell, transfer, assign, negotiate, or grant participation in all or any part of, or any interest in, such Lender's obligations, rights, and benefits under this Agreement and the other Loan Documents. Notwithstanding the foregoing, prior to the occurrence of an Event of Default that is continuing, neither Agent nor any Lender shall assign any interest in the Loan Documents to any Person who is (a) a direct competitor of Borrower, whether as an operating company or direct or indirect parent with voting control over such operating company or (b) a distressed debt fund; provided that the minimum amount of any such sale, transfer, assignment or negotiation effected to a Person that is not an Affiliate of any Lender prior to the occurrence of an Event of Default that is continuing shall be One Million Dollars (\$1,000,000).

12.3 Indemnification.

(a) **General Indemnification.** Borrower shall indemnify, defend and hold Agent, each Lender and their respective partners, directors, officers, employees, agents, trustees, administrators, managers, advisors and representatives of Agent and its Affiliates or any Lender and its Affiliates (each, an "**Indemnified Person**") harmless against: (i) all losses, claims, damages, liabilities and related expenses (including Lenders' Expenses and the reasonable fees, charges and disbursements of any counsel for any Indemnified Person) (collectively, "**Claims**") arising out of, in connection with, or as a result of (i) the execution or delivery of this Agreement, any other Loan Document or any agreement or instrument contemplated hereby or thereby, the performance by the parties hereto of their respective obligations hereunder or thereunder or the consummation of the transactions contemplated hereby or thereby, (ii) any Credit Extension or the use or proposed use of the proceeds therefrom, (iii) any actual or alleged presence or release of hazardous materials on or from any property owned or operated by Borrower or any of its Subsidiaries, or any environmental liability related in any way to Borrower or any of its Subsidiaries, or (iv) any actual or prospective claim, litigation, investigation or proceeding relating to any of the foregoing, whether based on contract, tort or any other theory, whether brought by a third party or by Borrower, and regardless of whether any Indemnified Person is a party thereto; provided that such indemnity shall not, as to any Indemnified Person, be available to the extent that such losses, claims, damages, liabilities or related expenses are determined by a court of competent jurisdiction by final and non-appealable judgment to have resulted from the gross negligence or willful misconduct of such Indemnified Person. All amounts due under this Section 12.3 shall be payable promptly after demand therefor.

(b) **Waiver of Consequential Damages, Etc.** To the fullest extent permitted by Applicable Law, Borrower shall not assert, and hereby waives, any claim against any Indemnified Person, on any theory of liability, for special, indirect, consequential or punitive damages (as opposed to direct or actual damages) or any loss of profits arising out of, in connection with, or as a result of, this Agreement, any other Loan Document or any agreement or instrument contemplated hereby, the transactions contemplated hereby or thereby, any Credit Extension, or the use of the proceeds thereof. No Indemnified Person shall be liable for any damages arising from the use by unintended recipients of any information or other materials distributed by it through telecommunications, electronic or other information transmission systems in connection with this Agreement or the other Loan Documents or the transactions contemplated hereby or thereby.

This Section 12.3 shall survive the termination of this Agreement and the repayment of all Obligations until all statutes of limitation with respect to the Claims, losses, and expenses for which indemnity is given shall have run.

12.4 Time of Essence. Time is of the essence for the performance of all Obligations in this Agreement.

12.5 Severability of Provisions. Each provision of this Agreement is severable from every other provision in determining the enforceability of any provision.

12.6 Amendments in Writing; Waiver; Integration. No purported amendment or modification of any Loan Document, or waiver, discharge or termination of any obligation under any Loan Document, shall be effective unless, and only to the extent, expressly set forth in a writing signed by Agent, with the consent of the

Lenders in accordance with the Lender Intercreditor Agreement or, if such item is not addressed in the Lender Intercreditor Agreement, as consented to by a majority of the Lenders, and Borrower. Without limiting the generality of the foregoing, no oral promise or statement, nor any action, inaction, delay, failure to require performance or course of conduct shall operate as, or evidence, an amendment, supplement or waiver or have any other effect on any Loan Document. Any waiver granted shall be limited to the specific circumstance expressly described in it, and shall not apply to any subsequent or other circumstance, whether similar or dissimilar, or give rise to, or evidence, any obligation or commitment to grant any further waiver. The Loan Documents represent the entire agreement about this subject matter and supersede prior negotiations or agreements. All prior agreements, understandings, representations, warranties, and negotiations between the parties about the subject matter of the Loan Documents merge into the Loan Documents.

12.7 Counterparts. This Agreement may be executed in any number of counterparts and by different parties on separate counterparts, each of which, when executed and delivered, is an original, and all taken together, constitute one Agreement. Delivery of an executed signature page of this Agreement by electronic mail transmission shall be effective as delivery of a manually executed counterpart hereof.

12.8 Confidentiality. Agent and each Lender agrees to maintain the confidentiality of Information (as defined below), except that Information may be disclosed (a) to Agent and/or any Lender's Subsidiaries and Affiliates, and their respective employees, directors, agents, attorneys, accountants, investors, potential investors, and other professional advisors (collectively, "**Representatives**" and, together with Agent and the Lenders, collectively, "**Lender Entities**"); (b) to prospective transferees, assignees, credit providers or purchasers of Agent's or Lenders' interests under or in connection with this Agreement and their Representatives (provided, however, Agent and the Lenders shall use commercially reasonable efforts to obtain any such prospective transferee's, assignee's, credit provider's, purchaser's or their Representatives' agreement to the terms of this provision); (c) as required by law, regulation, subpoena, or other order; (d) to Agent's or any Lender's regulators or as otherwise required or requested in connection with Agent's or any Lender's examination or audit; (e) in connection with the exercise of remedies under the Loan Documents or any action or proceeding relating to this Agreement or any other Loan Document or the enforcement of rights hereunder or thereunder; and (f) to third-party service providers of Agent and/or any Lender so long as such service providers have executed a confidentiality agreement with Agent or the Lenders, as applicable, with terms no less restrictive than those contained herein. "**Information**" means all information received from Borrower regarding Borrower or its business, in each case other than information that is either: (i) in the public domain or in Agent's or any Lender's possession when disclosed to Agent or such Lender, or becomes part of the public domain (other than as a result of its disclosure by Agent or a Lender in violation of this Agreement) after disclosure to Agent and/or the Lenders; or (ii) disclosed to Agent and/or a Lender by a third party, if Agent or such Lender, as applicable, does not know that the third party is prohibited from disclosing the information.

12.9 Electronic Execution of Documents. The words "execution," "signed," "signature" and words of like import in any Loan Document shall be deemed to include electronic signatures or the keeping of records in electronic form, each of which shall be of the same legal effect, validity and enforceability as a manually executed signature or the use of a paper-based recordkeeping systems, as the case may be, to the extent and as provided for in any Applicable Law, including, without limitation, any state law.

12.10 Right of Setoff. Borrower hereby grants to Agent, for the ratable benefit of the Lenders, a Lien, security interest, and a right of setoff as security for all Obligations to Agent and the Lenders, whether now existing or hereafter arising upon and against all deposits, credits, collateral and property, now or hereafter in the possession, custody, safekeeping or control of Agent or any entity under the control of Agent (including a subsidiary of Agent) or in transit to any of them, and other obligations owing to Agent or any such entity. At any time after the occurrence and during the continuance of an Event of Default, without demand or notice, Agent or any Lender may setoff the same or any part thereof and apply the same to any Obligation of Borrower then due regardless of the adequacy of any other collateral securing the Obligations. ANY AND ALL RIGHTS TO REQUIRE AGENT OR ANY LENDER TO EXERCISE ITS RIGHTS OR REMEDIES WITH RESPECT TO ANY OTHER COLLATERAL WHICH SECURES THE OBLIGATIONS, PRIOR TO EXERCISING ITS RIGHT OF SETOFF WITH RESPECT TO SUCH DEPOSITS, CREDITS OR OTHER PROPERTY OF BORROWER, ARE HEREBY KNOWINGLY, VOLUNTARILY AND IRREVOCABLY WAIVED.

12.11 Captions and Section References. The headings used in this Agreement are for convenience only and shall not affect the interpretation of this Agreement. Unless indicated otherwise, section references herein are to sections of this Agreement.

12.12 Construction of Agreement. The parties hereto mutually acknowledge that they and their attorneys have participated in the preparation and negotiation of this Agreement. In cases of uncertainty this Agreement shall be construed without regard to which of the parties caused the uncertainty to exist.

12.13 Relationship. The relationship of the parties to this Agreement is determined solely by the provisions of this Agreement. The parties do not intend to create any agency, partnership, joint venture, trust, fiduciary or other relationship with duties or incidents different from those of parties to an arm's-length contract.

12.14 Third Parties. Nothing in this Agreement, whether express or implied, is intended to: (a) confer any benefits, rights or remedies under or by reason of this Agreement on any Persons other than the express parties to it and their respective permitted successors and assigns; (b) relieve or discharge the obligation or liability of any Person not an express party to this Agreement; or (c) give any Person not an express party to this Agreement any right of subrogation or action against any party to this Agreement.

12.15 Anti-Terrorism Law. Each Lender hereby notifies Borrower that, pursuant to the requirements of Anti-Terrorism Law, it may be required to obtain, verify and record information that identifies Borrower, which information may include the name and address of Borrower and other information that will allow Lender to identify Borrower in accordance with Anti-Terrorism Law. Borrower hereby agrees to take any action necessary to enable each Lender to comply with the requirements of Anti-Terrorism Law.

13 ACCOUNTING TERMS AND OTHER DEFINITIONS

13.1 Accounting and Other Terms.

(a) Accounting terms not defined in this Agreement shall be construed following GAAP. Calculations and determinations must be made following GAAP (except for with respect to unaudited financial statements for the absence of footnotes and subject to year-end audit adjustments), provided that if at any time any change in GAAP would affect the computation of any financial ratio or requirement set forth in any Loan Document, and either Borrower, Agent, and/or any Lender shall so request, Borrower and Agent shall negotiate in good faith to amend such ratio or requirement to preserve the original intent thereof in light of such change in GAAP; provided, further, that, until so amended, (i) such ratio or requirement shall continue to be computed in accordance with GAAP prior to such change therein and (ii) Borrower shall provide Agent financial statements and other documents required under this Agreement or as reasonably requested hereunder setting forth a reconciliation between calculations of such ratio or requirement made before and after giving effect to such change in GAAP.

(b) As used in the Loan Documents: (i) the words "shall" or "will" are mandatory, the word "may" is permissive, the word "or" is not exclusive, the words "includes" and "including" are not limiting, the singular includes the plural, and numbers denoting amounts that are set off in brackets are negative; (ii) the term "continuing" in the context of an Event of Default means that the Event of Default has not been remedied (if capable of being remedied) or waived; and (iii) whenever a representation or warranty is made to Borrower's knowledge or awareness, to the "best of" Borrower's knowledge, or with a similar qualification, knowledge or awareness means the actual knowledge, after reasonable investigation, of any Responsible Officer.

13.2 Definitions. Capitalized terms not otherwise defined in this Agreement shall have the meanings set forth in this Section 13.2 of this Agreement. All other terms contained in this Agreement, unless otherwise indicated, shall have the meaning provided by the Code to the extent such terms are defined therein. As used in this Agreement, the following capitalized terms have the following meanings:

"Account" is, as to any Person, any "account" of such Person as "account" is defined in the Code with such additions to such term as may hereafter be made, and includes, without limitation, all accounts receivable and other sums owing to such Person.

“**Account Debtor**” is any “account debtor” as defined in the Code with such additions to such term as may hereafter be made.

“**Affiliate**” is, with respect to any Person, each other Person that owns or controls directly or indirectly the Person, any Person that controls or is controlled by or is under common control with the Person, and each of that Person’s senior executive officers, directors, partners and, for any Person that is a limited liability company, that Person’s managers and members.

“**Agent**” is defined in the preamble hereof.

“**Agreement**” is defined in the preamble hereof.

“**Anti-Terrorism Law**” means any law relating to terrorism or money-laundering, including Executive Order No. 13224 and the USA Patriot Act.

“**Applicable Law**” means all applicable provisions of constitutions, laws, statutes, ordinances, rules, treaties, regulations, permits, licenses, approvals, interpretations and orders of courts or Governmental Authorities and all orders and decrees of all courts and arbitrators.

“**Australian Subsidiary**” means Borrower’s wholly-owned Subsidiary AVROBIO Australia PTY LTD a corporation organized under the laws of Australia with an Australian business no. 53 618 483 695.

“**Authorized Signer**” means any individual listed in Borrower’s Borrowing Resolution who is authorized to execute the Loan Documents, including making (and executing if applicable) any Credit Extension request, on behalf of Borrower.

“**Bank Services**” are any products, credit services, and/or financial accommodations previously, now, or hereafter provided to Borrower or any of its Subsidiaries by SVB or any SVB Affiliate, including, without limitation, any letters of credit, cash management services (including, without limitation, merchant services, direct deposit of payroll, business credit cards, and check cashing services), interest rate swap arrangements, and foreign exchange services as any such products or services may be identified in SVB’s various agreements related thereto (each, a “**Bank Services Agreement**”).

“**Bank Services Agreement**” is defined in the definition of Bank Services.

“**Board**” means Borrower’s board of directors or equivalent governing body.

“**Borrower**” is set forth on Schedule I hereto.

“**Borrower’s Books**” are all Borrower’s books and records including ledgers, federal and state tax returns, records regarding Borrower’s assets or liabilities, the Collateral, business operations or financial condition, and all computer programs or storage or any equipment containing such information.

“**Borrowing Resolutions**” are, with respect to any Person, those resolutions adopted by such Person’s board of directors (and, if required under the terms of such Person’s Operating Documents, stockholders) and delivered by such Person to Agent approving the Loan Documents to which such Person is a party and the transactions contemplated thereby, together with a certificate executed by its secretary on behalf of such Person certifying (a) such Person has the authority to execute, deliver, and perform its obligations under each of the Loan Documents to which it is a party, (b) that set forth as a part of or attached as an exhibit to such certificate is a true, correct, and complete copy of the resolutions then in full force and effect authorizing and ratifying the execution, delivery, and performance by such Person of the Loan Documents to which it is a party, (c) the name(s) of the Person(s) authorized to execute the Loan Documents, including making (and executing if applicable) any Credit Extension request, on behalf of such Person, together with a sample of the true signature(s) of such Person(s), and (d) that Agent and Lenders may conclusively rely on such certificate unless and until such Person shall have delivered to Agent and Lenders a further certificate canceling or amending such prior certificate.

“Business Day” is a day other than a Saturday, Sunday or other day on which commercial banks in the State of California are authorized or required by law to close, except that if any determination of a “Business Day” shall relate to an FX Contract, the term “Business Day” shall be a FX Business Day.

“Canadian Subsidiary” means Borrower’s wholly-owned Subsidiary AVROBIO Inc. a corporation organized under the laws of Canada with business no. 80672 5362 RC0001.

“Cash Equivalents” are (a) marketable direct obligations issued or unconditionally guaranteed by the United States or any agency or any State thereof having maturities of not more than one (1) year from the date of acquisition; (b) commercial paper maturing no more than one (1) year after its creation and having the highest rating from either Standard & Poor’s Ratings Group or Moody’s Investors Service, Inc.; (c) SVB’s certificates of deposit issued maturing no more than one (1) year after issue; and (d) money market funds at least ninety-five percent (95.0%) of the assets of which constitute Cash Equivalents of the kinds described in clauses (a) through (c) of this definition.

“Change in Control” means (a) at any time, any “person” or “group” (as such terms are used in Sections 13(d) and 14(d) of the Exchange Act), shall become, or obtain rights (whether by means of warrants, options or otherwise) to become, the “beneficial owner” (as defined in Rules 13(d)-3 and 13(d)-5 under the Exchange Act), directly or indirectly, of forty percent (40.0%) or more of the ordinary voting power for the election of directors, partners, managers and members, as applicable, of Borrower (determined on a fully diluted basis) other than by the sale of Borrower’s equity securities in a public offering or to venture capital or private equity investors so long as Borrower identifies to the Agent and the Lenders the venture capital or private equity investors at least seven (7) Business Days prior to the closing of the transaction and provides to Agent and the Lenders a description of the material terms of the transaction; (b) during any period of twelve (12) consecutive months, a majority of the members of the Board of Borrower cease to be composed of individuals (i) who were members of that board or equivalent governing body on the first day of such period, (ii) whose election or nomination to that board or equivalent governing body was approved by individuals referred to in clause (i) above constituting at the time of such election or nomination at least a majority of that board or equivalent governing body or (iii) whose election or nomination to that board or other equivalent governing body was approved by individuals referred to in clauses (i) and (ii) above constituting at the time of such election or nomination at least a majority of that board or equivalent governing body; or (c) at any time, Borrower shall cease to own and control, of record and beneficially, directly or indirectly, one hundred percent (100.0%) of each class of outstanding stock, partnership, membership, or other ownership interest or other equity securities of each Subsidiary of Borrower free and clear of all Liens (except Permitted Liens).

“Change in Law” means the occurrence, after the Effective Date, of: (a) the adoption or taking effect of any law, rule, regulation or treaty; (b) any change in Applicable Law or in the administration, interpretation, implementation or application thereof by any Governmental Authority; or (c) the making or issuance of any request, rule, guideline or directive (whether or not having the force of law) by any Governmental Authority; provided that notwithstanding anything herein to the contrary, (i) the Dodd-Frank Wall Street Reform and Consumer Protection Act and all requests, rules, guidelines or directives thereunder or issued in connection therewith and (ii) all requests, rules, guidelines or directives promulgated by the Bank for International Settlements, the Basel Committee on Banking Supervision (or any successor or similar authority) or the United States or foreign regulatory authorities, in each case pursuant to Basel III, shall in each case be deemed to be a “Change in Law”, regardless of the date enacted, adopted or issued.

“Claims” is defined in Section 12.3.

“Code” is the Uniform Commercial Code, as the same may, from time to time, be enacted and in effect in the State of California; provided, that, to the extent that the Code is used to define any term herein or in any Loan Document and such term is defined differently in different Articles or Divisions of the Code, the definition of such term contained in Article or Division 9 shall govern; provided further, that in the event that, by reason of mandatory provisions of law, any or all of the attachment, perfection, or priority of, or remedies with respect to, Agent’s Lien on any Collateral is governed by the Uniform Commercial Code in effect in a jurisdiction other than the State of California, the term “Code” shall mean the Uniform Commercial Code as enacted and in effect in such other

jurisdiction solely for purposes of the provisions thereof relating to such attachment, perfection, priority, or remedies and for purposes of definitions relating to such provisions.

“**Collateral**” consists of all of Borrower’s right, title and interest in and to the following personal property:

(a) All goods, Accounts (including health-care receivables), Equipment, Inventory, contract rights or rights to payment of money, leases, license agreements, franchise agreements, General Intangibles (except as provided below), commercial tort claims, documents, instruments (including any promissory notes), chattel paper (whether tangible or electronic), cash, deposit accounts, certificates of deposit, fixtures, letters of credit rights (whether or not the letter of credit is evidenced by a writing), securities, securities accounts, securities entitlements, and all other investment property, supporting obligations, and financial assets, whether now owned or hereafter acquired, wherever located; and

(b) All Borrower’s Books relating to the foregoing, and any and all claims, rights and interests in any of the above and all substitutions for, additions, attachments, accessories, accessions and improvements to and replacements, products, proceeds and insurance proceeds of any or all of the foregoing.

(c) Notwithstanding the foregoing, the Collateral does not include Intellectual Property; provided, however, the Collateral shall include all Accounts and all proceeds of Intellectual Property. If a judicial authority (including a U.S. Bankruptcy Court) would hold that a security interest in the underlying Intellectual Property is necessary to have a security interest in such Accounts and such property that are proceeds of Intellectual Property, then the Collateral shall automatically, and effective as of the Effective Date, include the Intellectual Property to the extent necessary to permit perfection of Agent’s, for the ratable benefit of the Lenders, security interest in such Accounts and such other property of Borrower that are proceeds of the Intellectual Property.

(d) Pursuant to the terms of a certain negative pledge arrangement with Agent and the Lenders, Borrower has agreed not to encumber any of its Intellectual Property without Agent and the Lenders’ prior written consent.

“**Collateral Account**” is any Deposit Account, Securities Account, or Commodity Account.

“**Commitment**” and “**Commitments**” means the Term Loan Commitments.

“**Commodity Account**” is any “commodity account” as defined in the Code with such additions to such term as may hereafter be made.

“**Compliance Statement**” is that certain statement in the form attached hereto as Exhibit A.

“**Connection Income Taxes**” means Other Connection Taxes that are imposed on or measured by net income (however denominated) or that are franchise Taxes or branch profits Taxes.

“**Contingent Obligation**” is, for any Person, any direct or indirect liability of that Person for (a) any direct or indirect guaranty by such Person of any indebtedness, lease, dividend, letter of credit, credit card or other obligation of another, (b) any other obligation endorsed, co-made, discounted or sold with recourse by that Person, or for which that Person is directly or indirectly liable; (c) any obligations for undrawn letters of credit for the account of that Person; and (d) all obligations from any interest rate, currency or commodity swap agreement, interest rate cap or collar agreement, or other agreement or arrangement designated to protect a Person against fluctuation in interest rates, currency exchange rates or commodity prices; but “Contingent Obligation” does not include endorsements in the ordinary course of business. The amount of a Contingent Obligation is the stated or determined amount of the primary obligation for which the Contingent Obligation is made or, if not determinable, the maximum reasonably anticipated liability for it determined by the Person in good faith; but the amount may not exceed the maximum of the obligations under any guarantee or other support arrangement.

“**Control Agreement**” is any control agreement entered into among the depository institution at which Borrower maintains a Deposit Account or the securities intermediary or commodity intermediary at which Borrower

maintains a Securities Account or a Commodity Account, Borrower, and Agent pursuant to which Agent obtains control (within the meaning of the Code) for the benefit of the Lenders over such Deposit Account, Securities Account, or Commodity Account.

“**Copyrights**” are any and all copyright rights, copyright applications, copyright registrations and like protections in each work of authorship and derivative work thereof, whether published or unpublished and whether or not the same also constitutes a trade secret.

“**Credit Extension**” is any Letter of Credit, FX Contract, amount utilized for cash management services, Term Loan Advance, or any other extension of credit by any Lender for Borrower’s benefit.

“**Default**” means any event which with notice or passage of time or both, would constitute an Event of Default.

“**Default Rate**” is defined in Section 1.2(c).

“**Defaulting Lender**” is, subject to Section 9.10(b), any Lender that (a) has failed to (i) fund all or any portion of its Term Loan Advances within two (2) Business Days of the date such Term Loan Advances were required to be funded hereunder unless such Lender notifies Agent and Borrower in writing that such failure is the result of such Lender’s reasonable determination that one or more conditions precedent to funding (each of which conditions precedent, together with any applicable default, shall be specifically identified in such writing) has not been satisfied, or (ii) pay to Agent or any other Lender any other amount required to be paid by it hereunder within two (2) Business Days of the date when due, (b) has notified Borrower or Agent in writing that it does not intend to comply with its funding obligations hereunder, or has made a public statement to that effect (unless such writing or public statement relates to such Lender’s obligation to fund a Term Loan Advance hereunder and states that such position is based on such Lender’s reasonable determination that a condition precedent to funding (which condition precedent, together with any applicable default, shall be specifically identified in such writing or public statement) cannot be satisfied), (c) has failed, within three (3) Business Days after written request by Agent or Borrower, to confirm in writing to Agent and Borrower that it will comply with its prospective funding obligations hereunder (provided that such Lender shall cease to be a Defaulting Lender pursuant to this clause (c) upon receipt of such written confirmation by Agent and Borrower), or (d) has, or has a direct or indirect parent company that has, (i) become the subject of an Insolvency Proceeding, or (ii) had appointed for it a receiver, custodian, conservator, trustee, administrator, assignee for the benefit of creditors or similar Person charged with reorganization or liquidation of its business or assets, including the Federal Deposit Insurance Corporation or any other state or federal regulatory authority acting in such a capacity; provided that a Lender shall not be a Defaulting Lender solely by virtue of the ownership or acquisition of any equity interest in that Lender or any direct or indirect parent company thereof by a Governmental Authority so long as such ownership interest does not result in or provide such Lender with immunity from the jurisdiction of courts within the United States or from the enforcement of judgments or writs of attachment on its assets or permit such Lender (or such Governmental Authority) to reject, repudiate, disavow or disaffirm any contracts or agreements made with such Lender. Any determination by Agent that a Lender is a Defaulting Lender under any one or more of clauses (a) through (d) above shall be conclusive and binding absent manifest error, and such Lender shall be deemed to be a Defaulting Lender (subject to Section 9.10(b)) upon delivery of written notice of such determination to Borrower and each Lender.

“**Deposit Account**” is any “**deposit account**” as defined in the Code with such additions to such term as may hereafter be made.

“**Designated Deposit Account**” is the deposit account established by Borrower with SVB xxxxxx9738 for purposes of receiving Credit Extensions.

“**Disbursement Letter**” is that certain form attached hereto as Exhibit C.

“**Division**” means, in reference to any Person which is an entity, the division of such Person into two (2) or more separate Persons, with the dividing Person either continuing or terminating its existence as part of such division, including, without limitation, as contemplated under Section 18-217 of the Delaware Limited Liability

Company Act for limited liability companies formed under Delaware law, Section 17-220 of the Delaware Revised Uniform Limited Partnership Act for limited partnerships formed under Delaware law, or any analogous action taken pursuant to any other Applicable Law with respect to any corporation, limited liability company, partnership or other entity.

“**Dollar Equivalent**” is, at any time, (a) with respect to any amount denominated in Dollars, such amount, and (b) with respect to any amount denominated in a Foreign Currency, the equivalent amount therefor in Dollars as determined by Agent at such time on the basis of the then-prevailing rate of exchange in San Francisco, California, for sales of the Foreign Currency for transfer to the country issuing such Foreign Currency.

“**Dollars,**” “**dollars**” or use of the sign “\$” means only lawful money of the United States and not any other currency, regardless of whether that currency uses the “\$” sign to denote its currency or may be readily converted into lawful money of the United States.

“**Effective Date**” is set forth on Schedule I hereto.

“**Environmental Laws**” means any Applicable Law (including any permits, concessions, grants, franchises, licenses, agreements or governmental restrictions) relating to pollution or the protection of health, safety or the environment or the release of any materials into the environment (including those related to hazardous materials, air emissions, discharges to waste or public systems and health and safety matters).

“**Equipment**” is all “equipment” as defined in the Code with such additions to such term as may hereafter be made, and includes without limitation all machinery, fixtures, goods, vehicles (including motor vehicles and trailers), and any interest in any of the foregoing.

“**ERISA**” is the Employee Retirement Income Security Act of 1974, as amended, and its regulations.

“**Erroneous Payment**” has the meaning assigned to it in Section 9.11(a).

“**Erroneous Payment Deficiency Assignment**” has the meaning assigned to it in Section 9.11(d).

“**Erroneous Payment Return Deficiency**” has the meaning assigned to it in Section 9.11(d).

“**Erroneous Payment Subrogation Rights**” has the meaning assigned to it in Section 9.11(d).

“**Event of Default**” is defined in Section 7.

“**Exchange Act**” is the Securities Exchange Act of 1934, as amended.

“**Excluded Taxes**” means any of the following Taxes imposed on or with respect to SVB or required to be withheld or deducted from a payment to SVB, (a) Taxes imposed on or measured by net income (however denominated), franchise Taxes, and branch profits Taxes, in each case, (i) imposed as a result of SVB being organized under the laws of, or having its principal office or its applicable lending office located in, the jurisdiction imposing such Tax (or any political subdivision thereof) or (ii) that are Other Connection Taxes, (b) U.S. federal withholding Taxes imposed on amounts payable to or for the account of SVB with respect to an applicable interest in a Credit Extension pursuant to a law in effect on the date on which (i) SVB acquires such interest in the Credit Extensions or (ii) SVB changes its lending office, except in each case to the extent that, pursuant to Section 1.8, amounts with respect to such Taxes were payable either to SVB’s assignor immediately before SVB became a party hereto or to SVB immediately before it changed its lending office, (c) Taxes attributable to SVB’s failure to comply with Section 1.8(e), and (d) any withholding Taxes imposed under FATCA.

“**FATCA**” means Sections 1471 through 1474 of the Internal Revenue Code, as of the date of this Agreement (or any amended or successor version that is substantively comparable and not materially more onerous to comply with), any current or future regulations or official interpretations thereof, any agreements entered into pursuant to Section 1471(b)(1) of the Internal Revenue Code and any fiscal or regulatory legislation, rules or

practices adopted pursuant to any intergovernmental agreement, treaty or convention among Governmental Authorities and implementing such Sections of the Internal Revenue Code.

“**FDA**” is the United States Food and Drug Administration.

“**Federal Funds Effective Rate**” means, for any day, the weighted average of the rates on overnight federal funds transactions with members of the Federal Reserve System arranged by federal funds brokers, as published on the next succeeding Business Day by the Federal Reserve Bank of New York, or, if such rate is not so published for any day that is a Business Day, the average of the quotations for the day of such transactions received by SVB from three federal funds brokers of recognized standing selected by it.

“**Final Payment**” is a payment (in addition to and not in substitution for the regular monthly payments of principal plus accrued interest) equal to the original principal amount of each Term Loan Advance extended by the Lenders to Borrower hereunder multiplied by nine percent (9.00%), due on the earliest to occur of (a) the Term Loan Maturity Date, (b) the repayment of such Term Loan Advance, (c) as required pursuant to Sections 1.1(c) or 1.1(d), or (d) the termination of this Agreement.

“**Financial Statement Repository**” is NECreditSolutions@svb.com or such other means of collecting information approved and designated by Agent or a Lender after providing notice thereof to Borrower from time to time.

“**Foreign Accounts**” is defined in Section 5.7(a) hereof.

“**Foreign Currency**” is the lawful money of a country other than the United States.

“**Funding Date**” is any date on which a Credit Extension is made to or for the account of Borrower which shall be a Business Day.

“**FX Business Day**” is any day when (a) SVB’s Foreign Exchange Department is conducting its normal business and (b) the Foreign Currency being purchased or sold by Borrower is available to SVB from the entity from which SVB shall buy or sell such Foreign Currency.

“**FX Contract**” is any foreign exchange contract by and between Borrower and SVB under which Borrower commits to purchase from or sell to SVB a specific amount of Foreign Currency at a set price or on a specified date.

“**GAAP**” is generally accepted accounting principles set forth in the opinions and pronouncements of the Accounting Principles Board of the American Institute of Certified Public Accountants and statements and pronouncements of the Financial Accounting Standards Board or in such other statements by such other Person as may be approved by a significant segment of the accounting profession, which are applicable to the circumstances as of the date of determination.

“**General Intangibles**” is all “general intangibles” as defined in the Code in effect on the date hereof with such additions to such term as may hereafter be made, and includes without limitation, all Intellectual Property, claims, income and other tax refunds, security and other deposits, payment intangibles, contract rights, options to purchase or sell real or personal property, rights in all litigation presently or hereafter pending (whether in contract, tort or otherwise), insurance policies (including without limitation key man, property damage, and business interruption insurance), payments of insurance and rights to payment of any kind.

“**Good Faith Deposit**” is defined in Section 1.3(c).

“**Governmental Approval**” is any consent, authorization, approval, order, license, franchise, permit, certificate, accreditation, registration, filing or notice, of, issued by, from or to, or other act by or in respect of, any Governmental Authority, including, without limitation, Healthcare Permits.

“Governmental Authority” is any nation or government, any state or other political subdivision thereof, any agency, authority, instrumentality, regulatory body, court, central bank or other entity exercising executive, legislative, judicial, taxing, regulatory or administrative functions of or pertaining to government, any securities exchange and any self-regulatory organization.

“Group Member” means Borrower and its Subsidiaries.

“Guarantor” is any Person providing a Guaranty in favor of Lenders.

“Guaranty” is any guarantee of all or any part of the Obligations, as the same may from time to time be amended, restated, modified or otherwise supplemented.

“Healthcare Laws” means all Applicable Laws relating to the operation or management of hospitalist practices, the provision of hospitalist services, proper billing and collection practices relating to the payment for healthcare services, insurance law (including law related to payment for “no-fault” claims) and workers compensation law as they relate to the provision of, and billing and payment for, healthcare services, patient healthcare, patient healthcare information, patient abuse, the quality and adequacy of rehabilitative care, rate setting, equipment, personnel, operating policies, fee splitting, including, without limitation, (a) all federal and state fraud and abuse laws, including, without limitation, the federal Anti-Kickback Statute (42 U.S.C. §1320a-7b(b)), the Stark Law (42 U.S.C. §1395nn), the civil False Claims Act (31 U.S.C. §3729 et seq.), the administrative False Claims Law (42 U.S.C. § 1320a-7b(a)), the Anti-Inducement Law (42 U.S.C. § 1320a-7a(a)(5)), the exclusion laws (42 U.S.C. § 1320a-7); (b) the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009; (c) the Medicare Regulations and the Medicaid Program (Title XIX of the Social Security Act); (d) quality, safety and accreditation standards and requirements of all applicable state laws or regulatory bodies; (e) all laws, policies, procedures, requirements and regulations pursuant to which Healthcare Permits are issued; (f) any laws, regulations or administrative guidance with respect to fee splitting by healthcare professionals and the corporate practice of medicine in any jurisdiction in which any Borrower or any Guarantor operates; and (g) any and all comparable state or local laws and other applicable health care laws, regulations, manual provisions, policies and administrative guidance, each of (a) through (g) as may be amended from time to time and the regulations promulgated pursuant to each such law.

“Healthcare Permit” means, with respect to any Person, a permit issued or required under Healthcare Laws applicable to the business of Borrower or any Guarantor, or necessary in the possession, ownership, warehousing, marketing, promoting, sale, labeling, furnishing, distribution or delivery of goods or services under Healthcare Laws applicable to the business of Borrower or any Guarantor.

“HIPAA” means, collectively, the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic Clinical Health (HITECH) Act and the implementing regulations thereto.

“Indebtedness” is (a) indebtedness for borrowed money or the deferred price of property or services, such as reimbursement and other obligations for surety bonds and letters of credit, (b) obligations evidenced by notes, bonds, debentures or similar instruments, (c) capital lease obligations, (d) Contingent Obligations and (e) other short- and long-term obligations under debt agreements, lines of credit and extensions of credit.

“Indemnified Person” is defined in Section 12.3.

“Indemnified Taxes” means (a) Taxes, other than Excluded Taxes, imposed on or with respect to any payment made by or on account of any obligation of Borrower under any Loan Document and (b) to the extent not otherwise described in clause (a), Other Taxes.

“Information” is defined in Section 12.8.

“Initial Tranche A Term Loan Advance” is defined in Section 1.1(a).

“Insolvency Proceeding” is any proceeding by or against any Person under the United States Bankruptcy Code, or any other bankruptcy or insolvency law, including assignments for the benefit of creditors, compositions, extensions generally with its creditors, or proceedings seeking reorganization, arrangement, receivership or other relief.

“Intellectual Property” means, with respect to any Person, all of such Person’s right, title, and interest in and to the following:

- (a) its Copyrights, Trademarks and Patents;
- (b) any and all trade secrets and trade secret rights, including, without limitation, any rights to unpatented inventions, know-how and operating manuals;
- (c) any and all source code;
- (d) any and all design rights which may be available to such Person;
- (e) any and all claims for damages by way of past, present and future infringement of any of the foregoing, with the right, but not the obligation, to sue for and collect such damages for said use or infringement of the Intellectual Property rights identified above; and
- (f) all amendments, renewals and extensions of any of the Copyrights, Trademarks or Patents.

“Internal Revenue Code” means the U.S. Internal Revenue Code of 1986, and the rules and regulations promulgated thereunder, each as amended or modified from time to time.

“Inventory” is all **“inventory”** as defined in the Code in effect on the date hereof with such additions to such term as may hereafter be made, and includes without limitation all merchandise, raw materials, parts, supplies, packing and shipping materials, work in process and finished products, including without limitation such inventory as is temporarily out of Borrower’s custody or possession or in transit and including any returned goods and any documents of title representing any of the above.

“Investment” is any beneficial ownership interest in any Person (including stock, partnership, membership, or other ownership interest or other equity securities), and any loan, advance or capital contribution to any Person.

“Key Person” is each of Borrower’s (a) Chief Executive Officer, who is Geoff MacKay as of the Effective Date and (b) Chief Financial Officer, who is Erik Ostrowski as of the Effective Date.

“Lender” and **“Lenders”** is defined in the preamble.

“Lender Entities” is defined in Section 12.8.

“Lender Intercreditor Agreement” is, collectively, any and all intercreditor agreement, participation agreements, master arrangement agreement or similar agreement by and between SVB Capital and SVB, as each may be amended from time to time in accordance with the provisions thereof.

“Lenders’ Expenses” are all of Agent’s and the Lenders’ audit fees and expenses, costs, and expenses (including reasonable attorneys’ fees and expenses) for preparing, amending, negotiating, administering, defending and enforcing the Loan Documents (including, without limitation, those incurred in connection with appeals or Insolvency Proceedings) or otherwise incurred with respect to Borrower.

“Letter of Credit” is a standby or commercial letter of credit issued by SVB upon request of Borrower based upon an application, guarantee, indemnity, or similar agreement.

“**Lien**” is a claim, mortgage, deed of trust, levy, attachment charge, pledge, hypothecation, security interest or other encumbrance of any kind, whether voluntarily incurred or arising by operation of law or otherwise against any property.

“**Loan Documents**” are, collectively, this Agreement and any schedules, exhibits, certificates, notices, and any other documents related to this Agreement, the Perfection Certificate, the Pledge Agreement, each Disbursement Letter, the Lender Intercreditor Agreement, any Control Agreement, any Bank Services Agreement, any subordination agreement, any note, or notes or guaranties executed by Borrower or any Guarantor, landlord waivers and consents, bailee waivers and consents, and any other present or future agreement by Borrower and/or any Guarantor with or for the benefit of Agent and the Lenders in connection with this Agreement or Bank Services, all as amended, restated, or otherwise modified in accordance with the terms thereof.

“**Material Adverse Change**” is (a) a material impairment in the perfection or priority of Agent’s, for the ratable benefit of the Lenders, Lien in the Collateral or in the value of such Collateral; (b) a material adverse change in the business, operations, or condition (financial or otherwise) of Borrower; or (c) a material impairment of the prospect of repayment of any portion of the Obligations.

“**MSC Subsidiary**” means (a) AVROBIO Securities Corporation, and (b) any other Subsidiary of any Borrower or Guarantor incorporated under the laws of the Commonwealth of Massachusetts 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.

“**Obligations**” are Borrower’s obligations to pay when due any debts, principal, interest, fees, Lenders’ Expenses, the Final Payment, the Prepayment Premium, and other amounts Borrower owes Agent or any Lender now or later, whether under this Agreement, the other Loan Documents, or otherwise, including, without limitation, all obligations relating to Bank Services, if any, and including interest accruing after Insolvency Proceedings begin and debts, liabilities, or obligations of Borrower assigned to Agent and/or the Lenders, and to perform Borrower’s duties under the Loan Documents.

“**OFAC**” is the Office of Foreign Assets Control of the United States Department of the Treasury and any successor thereto.

“**Operating Documents**” are, for any Person, such Person’s formation documents, as certified by the Secretary of State (or equivalent agency) of such Person’s jurisdiction of organization on a date that is no earlier than thirty (30) days prior to the Effective Date, and, (a) if such Person is a corporation, its bylaws in current form, (b) if such Person is a limited liability company, its limited liability company agreement (or similar agreement), and (c) if such Person is a partnership or limited partnership, its partnership agreement or limited partnership agreement (or similar agreement), each of the foregoing with all current amendments or modifications thereto.

“**Other Connection Taxes**” means, with respect to SVB, Taxes imposed as a result of a present or former connection between SVB and the jurisdiction imposing such Tax (other than connections arising from SVB having executed, delivered, become a party to, performed its obligations under, received payments under, received or perfected a security interest under, engaged in any other transaction pursuant to or enforced any Loan Document, or sold or assigned an interest in any Credit Extension or Loan Document).

“**Other Taxes**” means all present or future stamp, court, documentary, intangible, recording, filing or similar Taxes that arise from any payment made under, from the execution, delivery, performance, enforcement or registration of, from the receipt or perfection of a security interest under, or otherwise with respect to, any Loan Document, except any such Taxes that are Other Connection Taxes imposed with respect to an assignment.

“**Patents**” means all patents, patent applications and like protections including without limitation improvements, divisions, continuations, renewals, reissues, extensions and continuations-in-part of the same.

“**Payment/Advance Form**” is that certain form attached hereto as Exhibit B.

“**Payment Date**” is set forth on Schedule I hereto.

“**Payment Recipient**” has the meaning assigned to it in Section 9.11(a).

“**Perfection Certificate**” is the Perfection Certificate delivered by Borrower in connection with this Agreement.

“**Permitted Indebtedness**” is:

- (a) Borrower’s Indebtedness to Agent and the Lenders under this Agreement, the other Loan Documents;
- (b) Indebtedness existing on the Effective Date and shown on the Perfection Certificate;
- (c) Subordinated Debt;
- (d) unsecured Indebtedness to trade creditors incurred in the ordinary course of business;
- (e) Indebtedness incurred as a result of endorsing negotiable instruments received in the ordinary course of business;
- (f) Indebtedness secured by Liens permitted under clauses (a) and (c) of the definition of “Permitted Liens” hereunder;
- (g) Indebtedness in the form of security deposits related to real property leases in an aggregate amount not to exceed Six Hundred Thousand Dollars (\$600,000);
- (h) other unsecured Indebtedness not exceeding Five Hundred Thousand Dollars (\$500,000) in the aggregate at any time;

and

(i) extensions, refinancings, modifications, amendments and restatements of any items of Permitted Indebtedness (a) through (h) above, provided that the principal amount thereof is not increased or the terms thereof are not modified to impose more burdensome terms upon Borrower or its Subsidiary, as the case may be.

“**Permitted Investments**” are:

- (a) Investments (including, without limitation, Subsidiaries) existing on the Effective Date and shown on the Perfection Certificate;
- (b) Investments consisting of (i) Cash Equivalents and (ii) Investments permitted by Borrower’s investment policy, as amended from time to time, provided that any amendment to such investment policy shall be approved, in advance, in writing, by Agent;
- (c) Investments consisting of the endorsement of negotiable instruments for deposit or collection or similar transactions in the ordinary course of Borrower’s business;
- (d) Investments accepted in connection with Transfers permitted by Section 6.1;
- (e) Investments (i) by any Borrower or secured Guarantor hereunder in any other Borrower or secured Guarantor hereunder, (ii) by Borrower in the Australian Subsidiary, the Canadian Subsidiary, and any other Subsidiary that is not a co-Borrower or secured Guarantor hereunder not to exceed Two Million Dollars (\$2,000,000) in the aggregate in any fiscal year, and (iii) by Subsidiaries that are not co-Borrowers or secured Guarantors hereunder in other Subsidiaries that are not co-Borrowers or secured Guarantors hereunder or in Borrower;

(f) Investments consisting of the creation of a Subsidiary for the purpose of consummating a merger transaction permitted by Section 6.3 of this Agreement, which is otherwise a Permitted Investment;

(g) Investments consisting of (i) travel advances and employee relocation loans and other employee loans and advances in the ordinary course of business, and (ii) loans to employees, officers, directors, partners, managers and members relating to the purchase of equity securities of Borrower or its Subsidiaries pursuant to employee equity purchase plans or similar agreements approved by the Board;

(h) Investments (including debt obligations) received in connection with the bankruptcy or reorganization of customers or suppliers and in settlement of delinquent obligations of, and other disputes with, customers or suppliers arising in the ordinary course of business;

(i) Investments consisting of notes receivable of, or prepaid royalties and other credit extensions, to customers and suppliers who are not Affiliates, in the ordinary course of business; provided that this paragraph (i) shall not apply to Investments of Borrower in any Subsidiary;

(j) cash Investments by any Borrower or secured Guarantor in MSC Subsidiaries; provided that no Event of Default has occurred and is continuing or would result from such Investment; and

(k) other Investments in an aggregate amount not exceeding Two Hundred Fifty Thousand Dollars (\$250,000) in any fiscal year of Borrower.

“Permitted Liens” are:

(a) Liens existing on the Effective Date which are shown on the Perfection Certificate or arising under this Agreement or the other Loan Documents;

(b) Liens for taxes, fees, assessments or other government charges or levies, either (i) not due and payable or (ii) being contested in good faith and for which Borrower maintains adequate reserves on Borrower’s Books, provided that no notice of any such Lien has been filed or recorded under the Internal Revenue Code;

(c) purchase money Liens (i) on Equipment acquired or held by Borrower incurred for financing the acquisition of the Equipment securing no more than Five Hundred Thousand Dollars (\$500,000) in the aggregate amount outstanding, or (ii) existing on Equipment when acquired, if the Lien is confined to the property and improvements and the proceeds of the Equipment;

(d) Liens of carriers, warehousemen, suppliers, or other Persons that are possessory in nature arising in the ordinary course of business so long as such Liens attach only to Inventory, securing liabilities in the aggregate amount not to exceed Two Hundred Thousand Dollars (\$200,000) and which are not delinquent or remain payable without penalty or which are being contested in good faith and by appropriate proceedings which proceedings have the effect of preventing the forfeiture or sale of the property subject thereto;

(e) Liens to secure payment of workers’ compensation, employment insurance, old-age pensions, social security and other like obligations incurred in the ordinary course of business (other than Liens imposed by ERISA);

(f) Liens incurred in the extension, renewal or refinancing of the Indebtedness secured by Liens described in (a) through (e), but any extension, renewal or replacement Lien must be limited to the property encumbered by the existing Lien and the principal amount of the indebtedness may not increase;

(g) leases or subleases of real property granted in the ordinary course of Borrower’s business (or, if referring to another Person, in the ordinary course of such Person’s business), and leases, subleases, non-exclusive licenses or sublicenses of personal property (other than Intellectual Property) granted in the ordinary course of Borrower’s business (or, if referring to another Person, in the ordinary course of such Person’s business), if the leases, subleases, licenses and sublicenses do not prohibit granting Agent a security interest therein;

(h) non-exclusive licenses of Intellectual Property granted to third parties in the ordinary course of business and licenses of Intellectual Property that could not result in a legal transfer of title of the licensed property that may be exclusive in respects other than territory and that may be exclusive as to territory only as to discrete geographical areas outside of the United States;

(i) Liens arising from attachments or judgments, orders, or decrees in circumstances not constituting an Event of Default under Sections 7.4 and 7.7;

(j) easements, rights-of-way, restrictions and other similar encumbrances affecting real property which, in the aggregate, are not substantial in amount, and which do not in any case materially detract from the value of the property subject thereto or materially interfere with the ordinary conduct of the business of the applicable Person;

(k) Liens in favor of customs or revenue authorities arising as a matter of law to secure payment of customs duties in connection with the importation of goods;

(l) customary Liens of any bank in connection with statutory, common law and contractual rights of setoff and recoupment with respect to any deposit account or securities account of Borrower, provided that (i) to the extent required by Section 5.7, Agent has a first priority perfected security interest in such account and (ii) such account is permitted to be maintained pursuant to Section 5.7 of this Agreement

(m) Liens in connection with security deposits related to real property leases in an aggregate amount not to exceed Six Hundred Thousand Dollars (\$600,000); and

(n) deposits to secure the performance of bids, trade contracts (other than for borrowed money), leases, statutory obligations, surety and appeal bonds, and other obligations of a like nature incurred in the ordinary course of business in an aggregate amount not to exceed Two Hundred Thousand Dollars (\$200,000).

“Person” is any individual, sole proprietorship, partnership, limited liability company, joint venture, company, trust, unincorporated organization, association, corporation, institution, public benefit corporation, firm, joint stock company, estate, entity or government agency.

“Pledge Agreement” is that certain Stock Pledge Agreement dated as of the Effective Date between Borrower and Agent, as amended, modified, supplemented and/or restated from time to time.

“Prepayment Premium” shall be an additional fee, payable to Agent, for the ratable benefit of the Lenders based on their Pro Rata Share, with respect to the Term Loan Advances, in an amount equal to:

- (a) for a prepayment of the Term Loan Advances made on or prior to the first (1st) anniversary of the Effective Date, one and one-half of one percent (1.5%) of the then outstanding principal amount of the Term Loan Advances immediately prior to the date of such prepayment;
- (b) for a prepayment of the Term Loan Advances made after the first (1st) anniversary of the Effective Date, but on or prior to the second (2nd) anniversary of the Effective Date, one percent (1.0%) of the then outstanding principal amount of the Term Loan Advances immediately prior to the date of such prepayment; and
- (c) for a prepayment of the Term Loan Advances made after the second (2nd) anniversary of the Effective Date, but prior to the Term Loan Maturity Date, zero percent (0.0%) of the then outstanding principal amount of the Term Loan Advances immediately prior to the date of such prepayment.

“Prime Rate” is set forth on Schedule I hereto.

“Prime Rate Margin” is set forth on Schedule I hereto.

“Pro Rata Share” is, as of any date of determination,, with respect to each Lender, a percentage (expressed as a decimal, rounded to the ninth decimal place) determined by *dividing* the outstanding principal amount of Term Loan Advances held by such Lender by the aggregate outstanding principal amount of all Term Loan Advances.

“Registered Organization” is any “registered organization” as defined in the Code with such additions to such term as may hereafter be made.

“Removal Effective Date” is defined in Section 9.10(d).

“Representatives” is defined in Section 12.8.

“Responsible Officer” is any of the Chief Executive Officer, President and Chief Financial Officer of Borrower.

“Restricted License” is any material license or other similar material agreement with respect to which Borrower is the licensee (a) that prohibits or otherwise restricts Borrower from granting a security interest in Borrower’s interest in such license or agreement or any other property, or (b) for which a default under or termination of could interfere with Agent’s right to sell any Collateral.

“Sanctioned Person” means a Person that: (a) is listed on any Sanctions list maintained by OFAC or any similar Sanctions list maintained by any other Governmental Authority having jurisdiction over Borrower; (b) is located, organized, or resident in any country, territory, or region that is the subject or target of Sanctions; or (c) is fifty percent (50.0%) or more owned or controlled by one (1) or more Persons described in clauses (a) and (b) hereof.

“Sanctions” means the economic sanctions laws, regulations, embargoes or restrictive measures administered, enacted or enforced by the United States government and any of its agencies, including, without limitation, OFAC and the U.S. State Department, or any other Governmental Authority having jurisdiction over Borrower.

“SEC” is the Securities and Exchange Commission, any successor thereto, and any analogous Governmental Authority.

“Securities Account” is any “securities account” as defined in the Code with such additions to such term as may hereafter be made.

“Subordinated Debt” is indebtedness incurred by Borrower or any of its Subsidiaries subordinated to all of Borrower’s or any of its Subsidiaries’ now or hereafter indebtedness to Agent and the Lenders (pursuant to a subordination, intercreditor, or other similar agreement in form and substance satisfactory to Agent and the Lenders entered into between Agent, the Lenders, and the other creditor), on terms acceptable to Agent and the Lenders.

“Subsequent Tranche A Term Loan Advance” is defined in Section 1.1(a).

“Subsidiary” is, as to any Person, a corporation, partnership, limited liability company or other entity of which shares of stock, partnership, membership, or other ownership interest or other equity securities having ordinary voting power (other than stock, partnership, membership, or other ownership interest or other equity securities having such power only by reason of the happening of a contingency) to elect a majority of the board of directors or other managers of such corporation, partnership or other entity are at the time owned, or the management of which is otherwise controlled, directly or indirectly through one or more intermediaries, or both, by such Person. Unless the context otherwise requires, each reference to a Subsidiary herein shall be a reference to a Subsidiary of Borrower or Guarantor.

“SVB” is defined in the preamble hereof.

“SVB Capital” is defined in the preamble hereof.

“**Taxes**” means all present or future taxes, levies, imposts, duties, deductions, withholdings (including backup withholding), assessments, fees or other charges imposed by any Governmental Authority, including any interest, additions to tax or penalties applicable thereto.

“**Term Loan Advance**” and “**Term Loan Advances**” are each defined in Section 1.1 of this Agreement.

“**Term Loan Amortization Date**” is set forth on Schedule I hereto.

“**Term Loan Availability Amount**” is set forth on Schedule I hereto.

“**Term Loan Commitment**” means, for any Lender, the obligation of such Lender to make a Term Loan Advance as and when available, up to the principal amount shown on Schedule II. “**Term Loan Commitments**” means the aggregate amount of such commitments of all Lenders.

“**Term Loan Commitment Percentage**” means, as to any Lender at any time, the percentage (carried out to the fourth decimal place) of the Term Loan Commitments represented by such Lender’s Term Loan Commitment at such time. The initial Term Loan Commitment Percentage of each Lender is set forth opposite the name of such Lender on Schedule II.

“**Term Loan Maturity Date**” is set forth on Schedule I hereto.

“**Trademarks**” means, with respect to any Person, any trademark and servicemark rights, whether registered or not, applications to register and registrations of the same and like protections, and the entire goodwill of the business of such Person connected with and symbolized by such trademarks.

“**Tranche A**” is defined in Section 1.1 of this Agreement.

“**Tranche A Draw Period**” is set forth on Schedule I hereto.

“**Tranche A Term Loan Advances**” is defined in Section 1.1 of this Agreement.

“**Tranche B**” is defined in Section 1.1 of this Agreement.

“**Tranche B Draw Condition**” is set forth on Schedule I hereto.

“**Tranche B Draw Period**” is set forth on Schedule I hereto.

“**Tranche B Term Loan Advance**” is defined in Section 1.1 of this Agreement.

“**Tranche C**” is defined in Section 1.1 of this Agreement.

“**Tranche C Draw Conditions**” is set forth on Schedule I hereto.

“**Tranche C Draw Period**” is set forth on Schedule I hereto.

“**Tranche C Term Loan Advance**” is defined in Section 1.1 of this Agreement.

“**Transfer**” is defined in Section 6.1.

“**Uncommitted Accordion**” is defined in Section 1.1 of this Agreement.

“**USA Patriot Act**” means the “Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act of 2001” (Public Law 107-56, signed into law on October 26, 2001), as amended from time to time.

[Signature page follows]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the Effective Date.

BORROWER:

AVROBIO, INC.

By: /s/ Erik Ostrowski

Name: Erik Ostrowski

Title: Chief Financial Officer and Treasurer

AGENT:

SILICON VALLEY BANK, as Agent

By: /s/ Lauren Cole

Name: Lauren Cole

Title: Director

LENDERS:

SILICON VALLEY BANK, as Lender

By: /s/ Lauren Cole

Name: Lauren Cole

Title: Director

SVB INNOVATION CREDIT FUND VIII, L.P., as Lender

By: SVB Innovation Credit Partners VIII, LLC, a
Delaware limited liability company, its General
Partner

By: /s/ Ryan Grammer

Name: Ryan Grammer

Title: Senior Managing Director

Signature Page to Loan and Security Agreement

SCHEDULE I
LSA PROVISIONS

LSA Section	LSA Provision
1.1(a) – Term Loan Advances – Availability	Each Term Loan Advance must be made in accordance with the terms and conditions set forth in Section 1.1(a) hereof. After repayment, no Term Loan Advance (or any portion thereof) may be reborrowed.
1.1(b) – Term Loan Advances – Repayment	Commencing on the Term Loan Amortization Date and continuing on each Payment Date thereafter, Borrower shall repay the aggregate outstanding Term Loan Advances to Agent, for the account of the Lenders, in (i) twenty four (24) equal monthly installments of principal, plus (ii) monthly payments of accrued interest at the rate set forth in Section 1.2(b).
1.2(a) – Interest Payments – Term Loan Advances	Interest on the principal amount of each Term Loan Advance is payable in arrears monthly (i) on each Payment Date commencing on the first (1st) Payment Date of the month following the month in which the Funding Date of the applicable Term Loan Advance occurs, (ii) on the date of any prepayment and (iii) on the Term Loan Maturity Date.
1.2(b) – Interest Rate – Term Loan Advances	The outstanding principal amount of any Term Loan Advance shall accrue interest at a floating rate per annum equal to the greater of (i) eight and one-tenth of one percent (8.10%) and (ii) the Prime Rate plus the Prime Rate Margin, which interest shall be payable in accordance with Section 1.2(a).
1.2(e) – Interest Computation	Interest shall be computed on the basis of the actual number of days elapsed and a 360-day year for any Credit Extension outstanding.
13.2 – “Borrower”	“ Borrower ” means AVROBIO, Inc. , a Delaware corporation.
13.2 – “Effective Date”	“ Effective Date ” is November 2, 2021.
13.2 – “Payment Date”	“ Payment Date ” is the first (1st) calendar day of each month.
13.2 – “Prime Rate”	“ Prime Rate ” is the rate of interest per annum from time to time published in the money rates section of <u>The Wall Street Journal</u> or any successor publication thereto as the “prime rate” then in effect; provided that if such rate of interest, as set forth from time to time in the money rates section of <u>The Wall Street Journal</u> , becomes unavailable for any reason as determined by Agent, the “Prime Rate” shall mean the rate of interest per annum announced by SVB as its prime rate in effect at its principal office in the State of California (such SVB announced Prime Rate not being intended to be the lowest rate of interest charged by SVB in connection with extensions of credit to debtors); provided that, in the event such rate of interest is less than zero percent (0.0%) per annum, such rate shall be deemed to be zero percent (0.0%) per annum for purposes of this Agreement.
13.2 – “Prime Rate Margin”	“ Prime Rate Margin ” is four and eighty-five-hundredths of one percent (4.85%).
13.2 – “Term Loan Amortization Date”	“ Term Loan Amortization Date ” is November 1, 2024.

13.2 – “Term Loan Availability Amount”	“ Term Loan Availability Amount ” is an aggregate principal amount equal to Fifty Million Dollars (\$50,000,000); provided however, if Lenders, in their sole and absolute discretion, grant Borrower’s request to make the Uncommitted Accordion available to Borrower, then “ Term Loan Availability Amount ” shall mean an aggregate principal amount equal to Sixty-Five Million Dollars (\$65,000,000).
13.2 – “Term Loan Maturity Date”	“ Term Loan Maturity Date ” is October 1, 2026.
13.2 – “Tranche A Draw Period”	“ Tranche A Draw Period ” is the period of time commencing on the Effective Date and continuing through the earlier to occur of (a) October 31, 2023, or (b) at the election of Agent, an Event of Default.
13.2 – “Tranche B Draw Condition”	“ Tranche B Draw Condition ” means Borrower has provided the Lenders with evidence, satisfactory to the Lenders in their reasonable discretion, confirming that the FDA has provided meeting minutes to Borrower in which the FDA did not raise any objections that could prevent Borrower from proceeding with its proposed registrational trial design for a biologic product to treat Fabry disease.
13.2 – “Tranche B Draw Period”	“ Tranche B Draw Period ” is the period of time commencing on the date when Borrower achieves the Tranche B Draw Condition and continuing through the earlier to occur of (a) October 31, 2023, or (b) at the election of Agent, an Event of Default.
13.2 – “Tranche C Draw Conditions”	“ Tranche C Draw Conditions ” means Borrower has provided the Lenders with evidence, satisfactory to the Lenders in their reasonable discretion, confirming that (a) Borrower has achieved the Tranche B Draw Condition, and (b) any one (1) of the following three (3) events has occurred: (i) with respect to a Borrower-sponsored clinical trial for a biologic product to treat cystinosis, either (y) the FDA has provided meeting minutes to Borrower in which the FDA did not raise any objections that could prevent Borrower from proceeding with its proposed trial design, or (z) (in the event no meeting with the FDA was held) the FDA did not place the clinical trial on hold within thirty (30) days of receiving Borrower’s clinical trial protocol amendment in which Borrower outlined its proposed trial design; (ii) Borrower has received positive data with respect to Borrower’s phase 1/2 clinical trial to treat Gaucher Type 1 sufficient to support advancing into the next stage of clinical development in Gaucher Type 1; or (iii) Borrower has received positive human data with respect to Gaucher Type 1 and/or Gaucher Type 3 sufficient to support advancing into the next stage of clinical development in Gaucher Type 3.
13.2 – “Tranche C Draw Period”	“ Tranche C Draw Period ” is the period of time commencing on the date when Borrower achieves the Tranche C Draw Conditions and continuing through the earlier to occur of (a) October 31, 2023, or (b) at the election of Agent, an Event of Default.

SCHEDULE II

LENDERS AND COMMITMENTS

TERM LOAN COMMITMENTS

<u>Lender</u>	<u>Initial Tranche A Term Loan Advance Commitment</u>	<u>Initial Tranche A Term Loan Advance Commitment Percentage</u>	<u>Subsequent Tranche A Term Loan Advance Commitment</u>	<u>Subsequent Tranche A Term Loan Advance Commitment Percentage</u>	<u>Tranche B Term Loan Advance Commitment</u>	<u>Tranche B Term Loan Advance Commitment Percentage</u>	<u>Tranche C Term Loan Advance Commitment</u>	<u>Tranche C Term Loan Advance Commitment Percentage</u>
Silicon Valley Bank	\$12,750,000	85.00%	\$12,750,000	85.00%	\$8,500,000	85.00%	\$8,500,000	85.00%
SVB Innovation Credit Fund VIII, L.P.	\$2,250,000	15.00%	\$2,250,000	15.00%	\$1,500,000	15.00%	\$1,500,000	15.00%
<u>TOTAL</u>	<u>\$15,000,000</u>	<u>100.00%</u>	<u>\$15,000,000</u>	<u>100.00%</u>	<u>\$10,000,000</u>	<u>100.00%</u>	<u>\$10,000,000</u>	<u>100.00%</u>

UNCOMMITTED ACCORDION

<u>Lender</u>	<u>Uncommitted Accordion</u>	<u>Uncommitted Accordion Percentage</u>
Silicon Valley Bank	\$12,750,000	85.00%
SVB Innovation Credit Fund VIII, L.P.	\$2,250,000	15.00%
<u>TOTAL</u>	<u>\$15,000,000</u>	<u>100.00%</u>

EXHIBIT A
COMPLIANCE STATEMENT

Date: _____

TO: SILICON VALLEY BANK (“SVB”), as Agent, SVB, and
SVB INNOVATION CREDIT FUND VIII, L.P., as Lender

FROM: AVROBIO, INC.

Under the terms and conditions of the Loan and Security Agreement among Borrower, Agent, and the Lenders (as amended, modified, supplemented and/or restated from time to time, the “Agreement”) Borrower is in complete compliance for the period ending _____ with all required covenants except as noted below. Attached are the required documents evidencing such compliance, setting forth calculations prepared in accordance with GAAP consistently applied from one period to the next except as explained in an accompanying letter or footnotes. Capitalized terms used but not otherwise defined herein shall have the meanings given them in the Agreement.

Please indicate compliance status by circling Yes/No under “Complies” column.

<u>Reporting Covenants</u>	<u>Required</u>	<u>Complies</u>
Quarterly financial statements with Compliance Statement	Quarterly within 45 days (90 days for Q4)	Yes No
Annual financial statements (CPA Audited)	FYE within 180 days	Yes No
10-Q, 10-K and 8-K	Within 5 days after filing with SEC	Yes No
Board approved budget and projections	FYE within 60 days and contemporaneously as amended/updated	Yes No
Bank Statements for accounts outside of SVB (MSC Subsidiaries)	Monthly within 30 days	Yes No

<u>Subsidiary Assets</u>	<u>Required</u>	<u>Actual</u>	<u>Complies</u>
Aggregate value of assets held by Australian Subsidiary	≤ \$500,000	\$ _____	Yes No
Aggregate value of assets held by Canadian Subsidiary	≤ \$500,000	\$ _____	Yes No

Other Matters

Have there been any amendments of or other changes to the capitalization table of Borrower or to the Operating Documents of Borrower or any of its Subsidiaries? If yes, provide copies of any such amendments or changes with this Compliance Statement. Yes No

The following are the exceptions with respect to the statements above: (If no exceptions exist, state “No exceptions to note.”)

EXHIBIT B
LOAN PAYMENT/ADVANCE REQUEST FORM

Date: _____

LOAN PAYMENT:

AVROBIO, INC.

From Account # _____ To Account # _____
(Deposit Account #) (Loan Account #)

Principal \$ _____ and/or Interest _____

\$ _____

Authorized Signature: _____ Phone Number: _____
Print Name/Title: _____

LOAN ADVANCE:

Complete *Outgoing Wire Request* section below if all or a portion of the funds from this loan advance are for an outgoing wire.

From Account # _____ To Account # _____
(Loan Account #) (Deposit Account #)

Amount of Term Loan Advance \$ _____

All Borrower's representations and warranties in the Loan and Security Agreement are true, correct and complete on the date of the request for an advance:

Authorized Signature: _____ Phone Number: _____
Print Name/Title: _____

OUTGOING WIRE REQUEST:

Complete only if all or a portion of funds from the loan advance above is to be wired.

Deadline for same day processing is noon, Eastern Time

Beneficiary Name: _____ Amount of Wire: \$ _____
Beneficiary Bank: _____ Account Number: _____
City and State: _____

Beneficiary Bank Transit (ABA) #: _____ Beneficiary Bank Code (Swift, Sort, Chip, etc.): _____
(For International Wire Only)

Intermediary Bank: _____ Transit (ABA) #: _____
For Further Credit to: _____

Special Instruction: _____

By signing below, I (we) acknowledge and agree that my (our) funds transfer request shall be processed in accordance with and subject to the terms and conditions set forth in the agreements(s) covering funds transfer service(s), which agreements(s) were previously received and executed by me (us).

Authorized Signature: _____ 2nd Signature (if required): _____
Print Name/Title: _____ Print Name/Title: _____
Telephone #: _____ Telephone #: _____

EXHIBIT C

Form of Disbursement Letter

[*see attached*]

DISBURSEMENT LETTER

_____, 20__

The undersigned, being an Authorized Signer of **AVROBIO, INC.**, a Delaware corporation ("**Borrower**"), does hereby certify to (a) **SILICON VALLEY BANK**, a California corporation ("**SVB**"), in its capacity as administrative agent and collateral agent ("**Agent**"), (b) **SVB**, as a lender, (c) **SVB INNOVATION CREDIT FUND VIII, L.P.**, a Delaware limited partnership ("**SVB Capital**"), as a lender (SVB and SVB Capital and each of the other "Lenders" from time to time a party hereto are referred to herein collectively as the "**Lenders**" and each individually as a "**Lender**") in connection with that certain Loan and Security Agreement dated as of November 2, 2021, by and among Borrower, Agent and the Lenders from time to time party thereto (the "**Loan Agreement**"; with other capitalized terms used herein having the meanings ascribed thereto in the Loan Agreement) that:

1. The representations and warranties made by Borrower in Section 4 of the Loan Agreement and in the other Loan Documents are true and correct in all material respects as of the date hereof.

2. No event or condition has occurred that would constitute an Event of Default under the Loan Agreement or any other Loan Document.

3. Borrower is in compliance with the covenants and requirements contained in Sections 3, 5 and 6 of the Loan Agreement.

4. All conditions referred to in Section 2 of the Loan Agreement to the making of a Credit Extension to be made on or about the date hereof have been satisfied or waived by Agent.

5. No Material Adverse Change has occurred.

6. The undersigned is an Authorized Signer.

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7. The proceeds of the Term Loan Advance shall be disbursed as follows:

Disbursement from SVB:

Loan Amount	\$ _____
<i>Plus:</i>	
--Deposit Received	\$ _____
<i>Less:</i>	
--[Interim Interest]	(\$ _____)
--Lenders' Legal Fees	(\$ _____)

Net Proceeds due from SVB: \$ _____

Disbursement from SVB Capital:

Loan Amount	\$ _____
<i>Less:</i>	
--[Interim Interest]	(\$ _____)

Net Proceeds due from SVB Capital: \$ _____

TOTAL TERM LOAN ADVANCE \$ _____

NET PROCEEDS FROM LENDERS \$ _____

8. The aggregate net proceeds of the Term Loan Advance shall be transferred to the Borrower's Designated Deposit Account as follows:

Account Name:	AVROBIO, INC.
Bank Name:	Silicon Valley Bank
Bank Address:	3003 Tasman Drive Santa Clara, California 95054
Account Number:	xxxxxxxxxx
ABA Number:	xxxxxxxxxx

[Balance of Page Intentionally Left Blank]

BORROWER:

AVROBIO, INC.

By: _____

Name: _____

Title: _____

AGENT:

SILICON VALLEY BANK, as Agent

By: _____

Name: _____

Title: _____

LENDERS:

SILICON VALLEY BANK, as Lender

By: _____

Name: _____

Title: _____

SVB INNOVATION CREDIT FUND VIII, L.P., as Lender

By: SVB Innovation Credit Partners VIII, LLC, a
Delaware limited liability company, its General
Partner

By: _____

Name: _____

Title: _____

[Signature Page to Disbursement Letter]

**CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Geoff MacKay, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of AVROBIO, 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(s) 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(s) 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: November 4, 2021

By: _____ /s/ Geoff MacKay

Geoff MacKay
Chief Executive Officer

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Quarterly Report of AVROBIO, Inc. (the "Company") on Form 10-Q for the period ending September 30, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned officers of the Company certifies, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, to the best of his or her knowledge that:

- (1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: November 4, 2021

By: _____
/s/ Geoff MacKay
Geoff MacKay
Chief Executive Officer

Date: November 4, 2021

By: _____
/s/ Erik Ostrowski
Erik Ostrowski
Chief Financial Officer