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, 2018

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: 001-36579

Adverum Biotechnologies, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**20-5258327**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

1035 O'Brien Drive,
Menlo Park, CA
(Address of principal executive offices)

94025
(Zip Code)

(650) 272-6269
(Registrant's telephone number, including area code)

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

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

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

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

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 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 31, 2018 there were 62,868,379 shares of the registrant's common stock, par value $0.0001 per share, outstanding.

Adverum Biotechnologies, Inc.

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PART I—FINANCIAL INFORMATION

Item 1. Financial Statements

Adverum Biotechnologies, Inc.
Condensed Consolidated Balance Sheets
(In thousands except share and per share data)

	September 30, 2018 (Unaudited)	December 31, 2017
Assets		
Current assets:		
Cash and cash equivalents	$ 159,673	$ 70,519
Short-term investments	58,209	119,966
Prepaid expenses and other current assets	4,292	3,256
Total current assets	222,174	193,741
Property and equipment, net	2,594	3,024
Restricted cash	999	–
Deposit and other long-term assets	140	140
Intangible asset	–	5,000
Total assets	$ 225,907	$ 201,905
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 1,736	$ 1,731
Accrued expenses and other current liabilities	7,777	6,964
Deferred rent, current portion	482	129
Deferred revenue, current portion	70	1,850
Total current liabilities	10,065	10,674
Deferred rent, net of current portion	102	222
Deferred revenue, net of current portion	–	5,250
Deferred tax liability	—	1,250
Other noncurrent liabilities	187	481
Total liabilities	10,354	17,877
Commitments and contingencies (Note 6)		
Stockholders' equity:		
Preferred stock, $0.0001 par value, 5,000,000 shares authorized; no shares issued and outstanding	—	—
Common stock, $0.0001 par value, 300,000,000 shares authorized at September 30, 2018 and December 31, 2017; 62,826,416 and 49,015,339 shares issued and outstanding at September 30, 2018 and December 31, 2017, respectively	6	5
Additional paid-in capital	521,285	439,048
Accumulated other comprehensive loss	(854)	(963)
Accumulated deficit	(304,884)	(254,062)
Total stockholders' equity	215,553	184,028
Total liabilities and stockholders' equity	$ 225,907	$ 201,905

See accompanying notes to condensed consolidated financial statements

Adverum Biotechnologies, Inc.
Condensed Consolidated Statements of Operations and Comprehensive Loss
(In thousands except per share data)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
	(Unaudited)			
Collaboration and license revenue	$ 833	$ 463	$ 1,542	$ 1,388
Operating expenses:				
Research and development	14,480	10,272	38,491	27,825
General and administrative	4,826	4,762	19,373	16,815
Impairment of intangible asset	5,000	—	5,000	—
Total operating expenses	24,306	15,034	62,864	44,640
Operating loss	(23,473)	(14,571)	(61,322)	(43,252)
Other income, net	1,265	742	3,104	1,894
Net loss before income tax benefit	(22,208)	(13,829)	(58,218)	(41,358)
Income tax benefit	1,250	—	1,250	—
Net loss	(20,958)	(13,829)	(56,968)	(41,358)
Other comprehensive loss:				
Net unrealized (loss) gain on marketable securities	53	35	129	(102)
Foreign currency translation adjustment	—	(183)	(21)	(442)
Comprehensive loss	$ (20,905)	$ (13,977)	$ (56,860)	$ (41,902)
Net loss per share -basic and diluted	$ (0.34)	$ (0.32)	$ (0.94)	$ (0.97)
Weighted-average common shares used to compute net loss per share - basic and diluted	62,454	43,381	60,856	42,849

See accompanying notes to condensed consolidated financial statements

Adverum Biotechnologies, Inc.
Condensed Consolidated Statements of Cash Flows
(In thousands)

	Nine Months Ended September 30,	
	2018	2017
	(Unaudited)	
Cash flows from operating activities:		
Net loss	$ (56,968)	$ (41,358)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	1,361	1,592
Stock-based compensation expense	12,250	6,839
Amortization of premium and accrued interest on marketable securities	199	419
Impairment of intangible asset	5,000	—
Other	(15)	60
Changes in operating assets and liabilities:		
Accounts receivable, net	—	886
Prepaid expenses and other current assets	(1,518)	(136)
Accounts payable	5	166
Accrued expenses and other current liabilities	353	(208)
Restructuring liabilities	—	(25)
Deferred revenue	(884)	(1,388)
Deferred rent	233	(70)
Deferred tax liability	(1,250)	—
Net cash used in operating activities	(41,234)	(33,223)
Cash flows from investing activities:		
Purchases of marketable securities	(55,924)	(201,038)
Maturities of marketable securities	117,993	45,061
Purchases of property and equipment	(652)	(918)
Net cash provided by (used in) investing activities	61,417	(156,895)
Cash flows from financing activities:		
Proceeds from offerings of common stock, net of issuance costs	70,189	—
Proceeds from issuance of common stock pursuant to option exercises	687	312
Taxes paid related to net share settlement of restricted stock units	(1,037)	(292)
Proceeds from employee stock purchase plan	149	83
Proceeds from a financing arrangement	100	—
Repayment of loan	(118)	—
Net cash provided by financing activities	69,970	103
Effect of foreign currency exchange rate on cash and cash equivalents	—	(442)
Net increase (decrease) in cash and cash equivalents and restricted cash	90,153	(190,457)
Cash and cash equivalents and restricted cash at beginning of period	70,519	222,170
Cash and cash equivalents and restricted cash at end of period	$ 160,672	$ 31,713
Supplemental schedule of noncash investing and financing information		
Unpaid deferred offering costs in accounts payable and accrued expenses	$ —	$ 200
Fixed assets in accounts payable, accrued expenses and other current liabilities	$ 278	$ 148

See accompanying notes to condensed consolidated financial statements.

Adverum Biotechnologies, Inc.
September 30, 2018

Notes to Condensed Consolidated Financial Statements
(Unaudited)

1. Organization and Basis of Presentation

Adverum Biotechnologies, Inc. (the "Company") was incorporated in Delaware on July 17, 2006 as Avalanche Biotechnologies, Inc. and changed its name to Adverum Biotechnologies, Inc. on May 11, 2016. The Company is headquartered in Menlo Park, California. The Company is a gene therapy company targeting unmet medical needs in ophthalmology and rare diseases. Since the Company's inception, it has devoted its efforts principally to performing research and development activities, including conducting preclinical studies and early clinical trials, filing patent applications, obtaining regulatory agreements, hiring personnel, and raising capital to support these activities.

The Company has not generated any revenue from the sale of products since its inception. The Company has experienced net losses since its inception and had an accumulated deficit of $304.9 million as of September 30, 2018. The Company expects to incur losses and have negative net cash flows from operating activities as it engages in further research and development activities. The Company believes that it has sufficient funds to continue operations at least through the first half of 2020.

Follow-on Offerings— In February 2018, the Company completed an underwritten public offering for the sale of 10,222,235 shares of its common stock and raised total net proceeds of $64.5 million, after discounts and other issuance costs.

In August 2017, the Company entered into an at-the-market sales agreement with an agent for the sales of its common stock at market price (the "2017 stock offering agreement"). In January 2018, the Company issued and sold a total of 1,419,893 shares of its common stock at market prices under the 2017 stock offering agreement and raised total net proceeds of $5.7 million, after issuance costs. Since then, during the nine months ended September 30, 2018, no additional shares were issued and sold under the 2017 stock offering agreement.

Basis of Presentation—The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles ("U.S. GAAP") and follow the requirements of the Securities and Exchange Commission ("SEC") for interim reporting. As permitted under those rules, certain footnotes or other financial information that are normally required by U.S. GAAP can be condensed or omitted. These unaudited condensed consolidated financial statements have been prepared on the same basis as the Company's annual consolidated financial statements and, in the opinion of management, reflect all adjustments, consisting only of normal recurring adjustments, which are necessary for a fair statement of the Company's consolidated financial information. The results of operations for the three and nine months ended September 30, 2018, are not necessarily indicative of the results to be expected for the full year or any other future period. The balance sheet as of December 31, 2017 is derived from the audited consolidated financial statements at that date but does not include all of the information required by U.S. GAAP for complete consolidated financial statements.

The accompanying unaudited condensed consolidated financial statements and related financial information should be read in conjunction with the audited consolidated financial statements and the related notes thereto included in the Company's Annual Report on Form 10-K for the year ended December 31, 2017 filed with the SEC.

2. Summary of Significant Accounting Policies

Use of Estimates— The accompanying consolidated financial statements have been prepared in accordance with U.S. GAAP. The preparation of the consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent liabilities and the reported amounts of expenses in the consolidated financial statements and the accompanying notes. On an ongoing basis, management evaluates its estimates, including those related to clinical trial accruals, fair value of assets and liabilities, income taxes, and stock-based compensation. Management bases its estimates on historical experience and on various other market-specific and relevant assumptions that management believes to be reasonable under the circumstances. Actual results could differ from those estimates.

Accounting Standard Updates Recently Adopted

Accounting Standard Update ("ASU") No. 2014-09, Revenue from Contracts with Customers ("Topic 606"), which supersedes the revenue recognition requirements in ASC 605, Revenue Recognition. Effective January 1, 2018, the Company adopted the new revenue standards under Topic 606 using the modified retrospective approach. Results for reporting periods beginning after January 1, 2018 are presented under Topic 606, while prior period results are not adjusted and continue to be reported in accordance with the revenue standards under Topic 605. Under Topic 606, the Company recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration which the Company expects to receive in exchange for those goods or services. To determine revenue recognition for arrangements that the Company determines are within the scope of ASC 606, the Company performs the following five steps: (i) identify the contract(s) with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) the Company satisfies a performance obligation. At contract inception, once the contract is determined to be within the scope of ASC 606, the Company assesses the goods or services promised within each contract and determines those that are performance obligations. The Company then recognizes as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

The Company's license and collaboration arrangements with Regeneron Pharmaceuticals, Inc. ("Regeneron"), Editas Medicine, Inc. ("Editas"), and GenSight Biologics ("GenSight") are within the scope of Topic 606.

Upon the adoption of Topic 606, the Company recorded a net decrease of $6.1 million to its deferred revenue and opening accumulated deficit as of January 1, 2018 for the cumulative effect of the adoption. The effect of the adoption is summarized for the Company's license and collaboration agreements as follows:

Collaboration Agreement with Regeneron— Under Topic 606, the transaction price at contract inception was determined to be $8.0 million, which was related to the non-refundable upfront payment for license and research services. The arrangement also provides for additional payments to the Company when certain development and regulatory milestones are achieved. Because these milestone payments are not within the control of the Company and are not considered probable of being achieved until the events occur, the Company did not include them in the transaction price at contract inception. The transaction price of $8.0 million at contract inception was allocated to two performance obligations. The Company's deferred revenue associated with its Regeneron collaboration agreement as of December 31, 2017 under Topic 605 was $6.5 million. As a result of adopting Topic 606, the Company recorded a $6.5 million reduction to its deferred revenue and opening accumulated deficit during the three months ended March 31, 2018 as the performance obligations associated with the Regeneron deferred revenue were satisfied as of January 1, 2018. There was no outstanding deferred revenue associated with Regeneron as of March 31, 2018 or September 30, 2018.

Collaboration Agreement with Editas— Under Topic 606, the transaction price at contract inception was determined to be $1.0 million, which was related to the non-refundable upfront payment for license and research services. The arrangement provides for additional payments to the Company when certain development and regulatory milestones are achieved. Because these milestone payments are not within the control of the Company and are not considered probable of being achieved until the events occur, the Company did not include them in the transaction price at contract inception. The transaction price of $1.0 million at contract inception was allocated to a single performance obligation. The Company's deferred revenue associated with its Editas collaboration agreement as of December 31, 2017 under Topic 605 was $0.5 million. As a result of adopting Topic 606, the Company recorded an increase of $0.4 million to its deferred revenue and opening accumulated deficit during the three months ended March 31, 2018 due to differences in the timing of recognition under Topic 606.

During the three and nine months ended September 30, 2018, the Company recognized revenue of $0.6 million and $1.3 million, respectively, associated with the Editas collaboration agreement. The Company's deferred revenue balance of $0.1 million as of September 30, 2018 was associated with Editas and is expected to be recognized over a period of one month as the research and development services are performed.

License Agreement with GenSight— On February 2014, the Company entered into an agreement with GenSight, where the Company granted GenSight a non-exclusive license to its proprietary AAV.7m8 vector. Under the agreement, the Company is eligible to receive development, regulatory and commercial milestones. Also, the Company is eligible to receive low to mid-single digit royalties on sales of GenSight's licensed products.

During the three months ended September 30, 2018, GenSight achieved a clinical development milestone pursuant to the agreement. This milestone was previously constrained under Topic 606. The Company earned a $0.2 million milestone payment, which was recognized as revenue in the condensed consolidated statement of operations and comprehensive loss for the three months ended September 30, 2018.

Under Topic 605, the Company's revenue for the three and nine months ended September 30, 2018 would have been $0.5 million and $1.6 million, respectively.

Recently Issued and Not Yet Adopted Accounting Pronouncements

In February 2016, the Financial Accounting Standards Board ("FASB") issued ASU No. 2016-2, Leases, which amends the current guidance on leasing activities to provide more transparency and comparability, and requires that all leases be recognized by lessees on their balance sheet as a right-of-use asset and corresponding lease liability, which are currently accounted for as operating leases. The new standard is effective for fiscal years and interim periods within those fiscal years beginning after December 15, 2018, with early adoption permitted. The Company will adopt the new standard using the modified retrospective approach as of January 1, 2019 and will recognize a right of use asset and lease liability on the adoption date. The Company has identified the population of lease agreements and is currently assessing the impact of other arrangements for embedded leases. While the Company continues to evaluate the effect of the standard, the Company anticipates that the adoption will result in a material increase in assets and liabilities on its consolidated balance sheet and will not have a material impact on the consolidated statement of operations or statement of cash flows.

3. Fair Value Measurements and Fair Value of Financial Instruments

The authoritative guidance on the fair value hierarchy for disclosure of fair value measurements is as follows:

Level 1: Quoted prices in active markets for identical assets or liabilities.

Level 2: Observable inputs other than Level 1 prices, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.

Level 3: Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

The fair value of Level 1 securities is determined using quoted prices in active markets for identical assets. Level 1 securities consist of highly liquid money market funds. Financial assets and liabilities are considered Level 2 when their fair values are determined using inputs that are observable in the market or can be derived principally from or corroborated by observable market data such as pricing for similar securities, recently executed transactions, cash flow models with yield curves, and benchmark securities. In addition, Level 2 financial instruments are valued using comparisons to like-kind financial instruments and models that use readily observable market data as their basis. U.S. government and agency securities, commercial paper, corporate bond and certificates of deposit are valued primarily using market prices of comparable securities, bid/ask quotes, interest rate yields and prepayment spreads and are included in Level 2. In certain cases where there is limited activity or less transparency around inputs to valuation, securities are classified as Level 3 within the valuation hierarchy.

The following is a summary of the Company's cash equivalents and short-term investments:

	September 30, 2018			
	Amortized Cost Basis	Unrealized Gains	Unrealized Loses	Estimated Fair Value
	(In thousands)			
Level 1:				
Money market funds	$ 125	$ —	$ —	$ 125
Level 2:				
U.S. government and agency securities	26,402	—	(41)	26,361
Commercial paper	166,264	—	—	166,264
Corporate bonds	19,844	—	(11)	19,833
Certificates of deposit	3,994	—	—	3,994
Total cash equivalents and short-term investments	216,629	—	(52)	216,577
Less: cash equivalents	(158,368)	—	—	(158,368)
Total short-term investments	$ 58,261	$ —	$ (52)	$ 58,209

	December 31, 2017			
	Amortized Cost Basis	Unrealized Gains	Unrealized Loses	Estimated Fair Value
	(In thousands)			
Level 1:				
Money market funds	$ 65	$ —	$ —	$ 65
Level 2:				
U.S. government and agency securities	58,351	—	(145)	58,206
Commercial paper	71,427	—	—	71,427
Corporate bonds	38,354	1	(38)	38,317
Certificates of deposit	9,731	—	—	9,731
Total cash equivalents and short-term investments	177,928	1	(183)	177,746
Less: cash equivalents	(57,780)	—	—	(57,780)
Total short-term investments	$ 120,148	$ 1	$ (183)	$ 119,966

As of September 30, 2018, the fair value of the Company's financing liability related to The Alpha-1 Project, Inc. (the "TAP financing") was zero. As of December 31, 2017, the fair value of TAP financing was $0.2 million, which was classified within Level 3 in the fair value hierarchy. The Company elected the fair value option to account for this financing arrangement. The fair value of the financing arrangement was determined based on the expected value approach and is classified as Level 3 within the fair value hierarchy. The key unobservable inputs in the valuation model include timing of milestones, probability of achievement of development and commercial milestones, and a discount factor.

There were no transfers within the hierarchy during the three and nine months ended September 30, 2018.

The Company's marketable securities as of September 30, 2018 mature within one year. Management regularly reviews all of the Company's investments for other-than-temporary declines in estimated fair value. Management's review includes the consideration of the cause of the impairment, including the creditworthiness of the security issuers, the number of securities in an unrealized loss position, the severity and duration of the unrealized losses, whether management has the intent to sell the securities and whether it is more likely than not that the Company will be required to sell the securities before the recovery of their amortized cost basis. Management determined that the gross unrealized losses of $0.1 million on the Company's marketable securities as of September 30, 2018 were temporary in nature. Therefore, none of the Company's marketable securities were other-than-temporarily impaired as of September 30, 2018.

4. Significant Agreements

Editas— In January 2018, the Company entered into an agreement to amend its collaboration, option and license agreement with Editas. The Company originally entered into an agreement with Editas in August 2016 pursuant to which the Company and Editas collaborate on certain studies using AAV vectors in connection with Editas' genome editing technology and the Company grants to Editas an exclusive option to obtain certain exclusive rights to use the Company's proprietary vectors in up to five ophthalmic indications. In January 2018, the Company and Editas extended the research collaboration, option and license agreement. In consideration for extending the agreement, Editas made a one-time, non-refundable cash payment of $0.5 million to the Company in February 2018. In June 2018, the Company and Editas entered into a subsequent amendment to the agreement to extend the Research Period and First Option Exercise Date (each as defined in the collaboration, option, and license agreement with Editas, as amended).

Under the terms of the agreement, as amended, Editas may exercise the option with respect to a designated initial indication until November 16, 2018. With respect to the four other indications, Editas may exercise the option until August 8, 2020, provided that the option will expire on August 8, 2019 if Editas has not exercised the option with respect to the initial indication or any other indication by such date. Upon Editas' timely exercise of the option with respect to the designated initial indication, Editas will pay the Company a $1.3 million fee. For the first additional indication for which Editas timely exercises its option, Editas will pay the Company a $1.5 million fee. Upon each subsequent exercise of the option, Editas will pay the Company a $1.0 million fee per indication. If Editas elects to develop a product using certain of the Company's proprietary vectors, the Company will be eligible to receive up to $15.5 million in development and commercialization milestone payments for such product, and tiered royalties between the mid-single digits and low teens on net sales of such product, subject to certain adjustments.

Unless earlier terminated, the agreement will be in effect until the later of the expiration of the option exercise period or the expiration of the royalty term of the last product. At any time after the option is first exercised, Editas may terminate the agreement for convenience in its entirety or on an indication-by-indication or country-by-country basis, upon prior written notice to the Company. The Company may also terminate the agreement if Editas challenges the Company's patents relating to its proprietary vectors and

does not withdraw such challenge within a defined period of time. In addition, either party may terminate the agreement with written notice upon a bankruptcy of the other party or upon an uncured material breach by the other party.

Under Topic 606, the transaction price is $1.5 million related to the $1.0 million non-refundable upfront payment for license and research services at contract inception and the one-time, non-refundable cash payment of $0.5 million made by Editas in February 2018 in consideration for extending the agreement. The arrangement provides for additional payments to the Company when certain development and regulatory milestones are achieved. Because these milestone payments are not within the control of the Company and are not considered probable of being achieved until the events occur, the Company did not include them in the transaction price. The transaction price of $1.5 million was allocated to a single performance obligation, research and development.

During the three and nine months ended September 30, 2018, the Company recognized revenue of $0.6 million and $1.3 million, respectively, associated with the Editas collaboration agreement. The Company's deferred revenue balance of $0.1 million as of September 30, 2018 was associated with Editas and is expected to be recognized over a period of one month as the research and development services are performed.

5. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consist of the following:

	September 30, 2018	December 31, 2017
	(In thousands)	
Accrued professional services	$ 2,359	$ 2,295
Employee compensation	2,852	2,259
Accrued preclinical, clinical and process development costs	1,973	2,165
Other	593	245
Total accrued expenses and other current liabilities	$ 7,777	$ 6,964

6. Commitments and Contingencies

Leases

On June 28, 2018, the Company entered into a lease on a new facility with office, laboratory, and manufacturing space, which will serve as the Company's new corporate headquarters. The term of the lease is ten years and also provides for two options to extend the lease term for a period of seven years each. The Company is obligated to make lease payments totaling approximately $49.3 million over the initial term of the lease.

Under the lease, the Company will receive a tenant improvement allowance for the costs associated with the design, development and construction of tenant improvements for the leased facility. The Company has provided the landlord with a letter of credit in the amount of $1.0 million. The security for the letter of credit of $1.0 million is classified as restricted cash under long term assets on the balance sheet.

As of September 30, 2018, the aggregate future minimum payments under the Company's leases are as follows:

Year ending December 31,	Future Commitments
	(In thousands)
2018 (remaining 3 months)	$ 294
2019	3,344
2020	4,221
2021	4,683
2022	4,846
Thereafter	33,853
Total minimum lease payments	$ 51,241

Legal Proceedings

From time to time, the Company may become involved in litigation and other legal actions. The Company estimates the range of liability related to any pending litigation where the amount and range of loss can be estimated. The Company records its best estimate of a loss when the loss is considered probable. Where a liability is probable and there is a range of estimated loss with no best estimate in the range, the Company records a charge equal to at least the minimum estimated liability for a loss contingency when both of the

following conditions are met: (i) information available prior to issuance of the financial statements indicates that it is probable that a liability had been incurred at the date of the financial statements and (ii) the range of loss can be reasonably estimated.

There have been no material changes from the legal proceedings described in our quarterly report on Form 10-Q for the period ended June 30, 2018.

7. Equity Incentive Awards

The following table summarizes the Company's option activity and related information:

	Number of Options (in thousands)	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Life (in years)	Aggregate Intrinsic Value (in thousands)
Balance at December 31, 2017	6,695	$ 4.51		
Options granted	1,709	6.29		
Options exercised	(1,596)	0.43		
Options cancelled	(520)	6.05		
Balance at September 30, 2018	6,288	$ 5.90	7.8	$ 13,001
Exercisable as of September 30, 2018	3,016	$ 6.83	7.0	$ 7,745

Restricted Stock Units ("RSUs")

The following table summarizes the Company's RSUs activity and related information:

	Number of Units (in thousands)	Weighted-Average Grant-Date Fair Value	Weighted-Average Remaining Contractual Term (in years)
Outstanding at December 31, 2017	2,515	$ 3.24	1.6
Granted	1,331	6.00	
Vested and released	(672)	3.38	
Forfeited	(517)	8.01	
Outstanding at September 30, 2018	2,657	$ 3.66	1.7

Stock-Based Compensation Expense

The following table presents, by operating expense, the Company's stock-based compensation expense:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
	(In thousands)			
Research and development	$ 1,693	$ 1,698	$ 4,892	$ 4,335
General and administrative	1,303	1,002	7,358	2,504
Total stock-based compensation expense	$ 2,996	$ 2,700	$ 12,250	$ 6,839

During the nine months ended September 30, 2018, the Company recorded approximately $4.1 million of stock-based compensation expense as a result of the modification of the vesting and exercisability of stock awards associated with the departure of two of its executives.

8. Net Loss per Share

Basic net loss per share is calculated by dividing the net loss by the weighted-average number of shares of common stock outstanding for the period. Diluted net loss per share is computed by giving effect to all potential dilutive common stock equivalents outstanding for the period using the treasury stock method. Outstanding stock options, RSUs, employee stock purchase plan ("ESPP") and

warrants are considered to be common stock equivalents and are only included in the calculation of diluted net loss per share when their effect is dilutive.

The Company excluded approximately 9.1 million and 10.0 million shares of potentially dilutive securities as of September 30, 2018 and 2017, respectively, from the computations of diluted weighted-shares outstanding because their effect would be anti-dilutive.

9. Impairment of Intangible Asset

The Company recorded In-process Research and Development ("IPR&D") intangible assets upon the acquisition of Annapurna in May 2016. The carrying value of the IPR&D intangible asset was $5.0 million as of June 30, 2018. The Company evaluates indefinite lived intangible assets for impairment on an annual basis or more frequently if indicators of impairment exist. During the three months ended September 30, 2018, the Company identified an impairment indicator related to the intangible asset and performed an impairment analysis. On October 30, 2018, the Company decided to discontinue the development of ADVM-043. The Company recorded an impairment charge of $5.0 million on IPR&D assets related to the Company's intangible asset for ADVM-043. This amount was recorded in Impairment of intangible assets on the Company's condensed consolidated statements of operations and comprehensive loss.

In connection with this impairment charge, the Company derecognized $1.3 million of the deferred tax liability related to the intangible asset for ADVM-043. This amount was recorded as income tax benefit on the Company's condensed consolidated statements of operations and comprehensive loss.

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

The interim financial statements included in this Quarterly Report on Form 10-Q and this Management's Discussion and Analysis of Financial Condition and Results of Operations should be read in conjunction with the financial statements and notes thereto for the year ended December 31, 2017, and the related Management's Discussion and Analysis of Financial Condition and Results of Operations, contained in our Annual Report on Form 10-K, as filed with the U.S. Securities and Exchange Commission (SEC) on March 6, 2018. In addition to historical information, this discussion and analysis contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (Securities Act), and Section 21E of the Securities Exchange Act of 1934, as amended (Exchange Act). These forward-looking statements are subject to risks and uncertainties, including those discussed in the section titled "Risk Factors," set forth in Part II – Other Information, Item 1A below and elsewhere in this report that could cause actual results to differ materially from historical results or anticipated results.

Overview

Adverum is a clinical-stage gene therapy company targeting unmet medical needs in ophthalmology and rare diseases. We develop gene therapy product candidates designed to provide durable efficacy by inducing sustained expression of a therapeutic protein. Our core capabilities include clinical development, novel vector discovery, and in-house manufacturing expertise, specifically in scalable process development, assay development, and current Good Manufacturing Practices ("cGMP") quality control. Our leadership team has significant drug development and gene therapy expertise.

We are advancing our gene therapy product candidate ADVM-022, AAV.7m8-aflibercept, for the treatment of wet age-related macular degeneration ("AMD"). ADVM-022 for the treatment of wet AMD utilizes a proprietary vector capsid (AAV.7m8) carrying an aflibercept coding sequence under the control of a proprietary expression cassette and is administered as a single intravitreal ("IVT") injection. Excess Vascular Endothelial Growth Factor ("VEGF") activity can lead to disease progression and vision loss. Current standard-of-care anti-VEGF therapies, such as aflibercept in EYLEA®, need to be administered frequently to patients (every 4-12 weeks). Reduced compliance with this regimen is associated with decrease in visual acuity. Administered as a single IVT injection, ADVM-022 for the treatment of wet AMD is designed to provide sustained therapeutic levels of aflibercept and to minimize the burden of frequent anti-VEGF injections. In September 2018, we received Fast Track designation for ADVM-022 for the treatment of wet AMD from the U.S. Food and Drug Administration ("FDA").

Our Investigational New Drug ("IND") application for ADVM-022 for the treatment of wet AMD became active in August 2018.We plan to initiate the Phase 1 OPTIC clinical trial for ADVM-022 in patients with wet AMD in the fourth quarter of 2018. The OPTIC clinical trial is designed to be a multi-center, open-label, Phase 1, dose-escalation safety study in patients with wet AMD who have demonstrated responsiveness to anti-VEGF treatment. A number of leading retinal centers across the United States are expected to participate in this trial. The OPTIC trial is expected to enroll 18 patients to evaluate three doses of ADVM-022 administered as a single IVT injection: first dose (6E11 vg/eye), second dose (2E12 vg/eye), and third dose (6E12 vg/eye). Patients will be administered a tapering prophylactic corticosteroid regimen beginning three days prior to dosing until 10 days post-dosing. The primary endpoint of the OPTIC trial is the safety and tolerability of ADVM-022 at 24 weeks after IVT injection. Secondary endpoints include changes in best-corrected visual acuity (BCVA) at 24 weeks, measurement of central retinal thickness (CRT), mean number of anti-VEGF rescue injections, and percent of patients needing anti-VEGF rescue injections. Each patient enrolled will be followed for a total of two years.

In October 2018, we presented long-term preclinical efficacy data on ADVM-022 for the treatment of wet AMD at the European Society of Gene and Cell Therapy 26th Annual Congress. Preclinical data demonstrated that a single IVT administration of ADVM-022 provided robust expression of aflibercept, sustained for approximately two years post-dose in non-human primates (NHPs). Additionally, a single intravitreal administration of ADVM-022 in NHPs at dose ranges of 2×10^{11} vg/eye to 2×10^{12} vg/eye provided stable intraocular expression of aflibercept at levels comparable with the levels measured in aflibercept recombinant protein-injected eyes approximately 3 to 4 weeks post-dose in all of the following: vitreous humor, aqueous humor, retina and choroid.

Previously, in May 2018, we presented long-term preclinical efficacy data on ADVM-022 for the treatment of wet AMD at the American Society of Gene & Cell Therapy 21st Annual Meeting. In this preclinical study in non-human primate models of wet AMD, the efficacy of ADVM-022 at 13 months post-administration was consistent with earlier reported data, demonstrating that a single IVT injection of ADVM-022 was well-tolerated and statistically significant ($p<0.0001$) in preventing the development of Grade IV lesions compared to the untreated vehicle control group. ADVM-022 induced long-term efficacy that was comparable to positive control aflibercept injected eyes. In this preclinical study, ADVM-022 for the treatment of wet AMD was well-tolerated, with no serious adverse events.

For A1AT deficiency, in November 2018, we announced our decision to discontinue the development of ADVM-043, an investigational AAVrh.10-based gene therapy construct for the treatment of A1AT deficiency. Based on the review of the ADVANCE Phase 1/2 study (the "ADVANCE study"), preliminary M-specific A1AT protein measurements did not reach clinically meaningful levels of expression and the data did not demonstrate the potential to reach M-protein threshold levels of 11μM.

We are reviewing the learnings from the ADVANCE study, notably on the AAVrh.10 capsid, in order to inform further development of gene therapy candidates for the treatment of systemic rare diseases. We plan to conduct additional preclinical studies to determine the best candidates to advance forward in development. We plan to provide an update on the rare disease programs in the first half of 2019 and will not submit an IND application for ADVM-053 for the treatment of hereditary angioedema ("HAE") in the fourth quarter of 2018.

Our partnered programs include vectors we are developing under collaboration agreements. Under an agreement with Editas Medicine, Inc. ("Editas") we are leveraging our AAV-vectors for use with Editas' leading CRISPR-based genome editing technologies to treat up to five inherited retinal diseases. Our agreement with Regeneron Pharmaceuticals, Inc. ("Regeneron") provides for development of up to eight distinct ocular therapeutic targets, four of which are already identified, including AVA-311 for the treatment of juvenile X-Linked Retinoschisis.

In June 2018 we signed a lease with an initial 10-year term for a new facility in Redwood City, California which we plan to occupy in the second half of 2019. This facility will serve as our new corporate headquarters and will include over 80,000 square feet of office, laboratory, and manufacturing space. We believe this facility will enable us to expand our manufacturing process development activities at the 2000-liter scale, as well as offer the opportunity for future cGMP manufacturing of our clinical trial material.

Financial Overview

Summary

We have not generated positive cash flow or net income from operations since our inception and, as of September 30, 2018, we had an accumulated deficit of $304.9 million. We expect to incur substantial expenses and increasing losses from operations in the foreseeable future as we continue our research and development efforts, advance our product candidates through preclinical and clinical development, manufacture clinical study materials, seek regulatory approval, and prepare for and, if approved, proceed to commercialization. We are at an early stage of development and may never be successful in developing or commercializing our product candidates. Based on our decisions to discontinue the development of ADVM-043 and our plan to conduct additional preclinical studies on our rare disease programs, we are currently assessing the financial impact of these decisions.

While we may in the future generate revenue from a variety of sources, including license fees, milestone and research and development payments in connection with strategic partnerships, and potentially revenue from product sales if any of our product candidates are approved, to date we have not generated any revenue from product sales.

We entered into collaboration and license arrangements with Regeneron in May 2014 and Editas in August 2016, which are revenue-generating arrangements. We currently have no operational clinical or commercial manufacturing facilities, and all of our clinical manufacturing activities are currently contracted out to third parties. Additionally, we use third-party clinical research organizations ("CROs") to carry out our clinical development and we do not have a sales organization.

We expect to incur substantial and increasing expenditures in the foreseeable future for the development and potential commercialization of our product candidates. We will need substantial additional funding in the future to support our operating activities as we advance our product candidates through preclinical and clinical development, seek regulatory approval and prepare for and, if approved, proceed to commercialization. Adequate funding may not be available to us on acceptable terms, or at all. If we are unable to raise capital, or to do so on acceptable terms, when needed, or to form additional collaboration partnerships to support our efforts, we could be forced to delay, reduce or eliminate our research and development programs or potential commercialization efforts.

In August 2017, we entered into an at-the-market sales agreement with an agent for the sales of our common stock at market price (the "2017 stock offering agreement"). Under the terms and conditions of the 2017 stock offering agreement, we may offer to sell our common stock for an aggregate offering price of up to $50.0 million through the agent from time to time. In January 2018, we sold a total of 1,419,893 shares of our common stock at market prices under the 2017 stock offering agreement and raised total net proceeds of $5.7 million, after issuance costs. Since then, during the nine months ended September 30, 2018, no additional shares were issued and sold under the 2017 stock offering agreement. Under the 2017 stock offering agreement, we have sold a total of 6,550,232 shares of our common stock at market prices, raising total net proceeds of $22.5 million, after issuance costs.

In February 2018, we completed an underwritten public offering for the sale of 10,222,235 shares of our common stock and raised total net proceeds of $64.5 million, after discounts and other issuance costs.

As of September 30, 2018, we had $217.9 million in cash, cash equivalents and short-term investments. We believe that we have sufficient funds to continue our operations at least through the first half of 2020.

Revenue

To date we have not generated any revenue from the sale of our products. We generate revenue through research, collaboration and license arrangements with our strategic partners.

Research and Development Expenses

Conducting a significant amount of research and development is central to our business model. Research and development expenses primarily include personnel-related costs, stock-based compensation expense, laboratory supplies, consulting costs, external contract research and development expenses, including expenses incurred under agreements with CROs, the cost of acquiring, developing and manufacturing clinical study materials, and overhead expenses, such as rent, equipment depreciation, insurance and utilities.

We expense research and development costs as incurred. We defer and expense advance payments for goods or services for future research and development activities as the goods are delivered or the related services are performed.

We estimate preclinical study and clinical trial expenses based on the services performed pursuant to contracts with research institutions and CROs that conduct and manage preclinical studies and clinical trials on our behalf. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. We estimate the amounts incurred through communications with third party service providers and our estimates of accrued expenses as of each balance sheet date are based on information available at the time. If the actual timing of the performance of services or the level of effort varies from the estimate, we will adjust the accrual accordingly.

At this time, we cannot reasonably estimate the nature, timing or aggregate costs of the efforts that will be necessary to complete the development of any of our product candidates. The successful development and commercialization of a product candidate is highly uncertain, and clinical development timelines, the probability of success, and development and commercialization costs can differ materially from expectations.

General and Administrative Expenses

General and administrative expenses primarily include personnel-related costs, stock-based compensation, professional fees for legal, consulting, audit and tax services, overhead expenses, such as rent, equipment depreciation, insurance and utilities, and other general operating expenses not otherwise included in research and development expenses. Our general and administrative expenses may increase in future periods if and to the extent we elect to increase our investment in infrastructure to support continued research and development activities and potential commercialization of our product candidates. We will continue to evaluate the need for such investment in conjunction with our ongoing consideration of our pipeline of product candidates. We anticipate increased expenses related to audit, legal and regulatory functions, as well as director and officer insurance premiums and investor relations costs.

Other Income, Net

Other income, net primarily consists of interest income on our cash equivalents and investments in marketable securities.

Income Taxes

On December 22, 2017, the U.S. government enacted comprehensive tax legislation, commonly known as the Tax Cuts and Jobs Act of 2017 (the “Act”), which significantly reforms the Internal Revenue Code of 1986, as amended. The Act contains broad and complex changes to corporate taxation, including in part reduction of the U.S. federal corporate tax rate from 35% to 21%, requires companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously considered permanently reinvested, and creates new taxes on certain foreign sourced earnings. On December 22, 2017, Staff Accounting Bulletin No. 118 ("SAB 118") was issued to address the application of U.S. GAAP in situations when a registrant does not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Act. Because we are still in the process of analyzing certain provisions of the Act including the application of new executive compensation limitation provisions under Internal Revenue Section 162(m) in accordance with SAB 118, we determined that the adjustment to our deferred taxes was a provisional amount.

Critical Accounting Policies and Significant Judgments and Estimates

Our management’s discussion and analysis of financial condition and results of operations are based upon our unaudited condensed consolidated financial statements, which have been prepared in accordance with U.S. GAAP. The preparation of these condensed consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses. On an on-going basis, we evaluate our critical accounting policies and estimates. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable in 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. Actual results may differ from these estimates under different assumptions and conditions. Except as noted below, there have been no material changes to our critical accounting policies from those described in our Annual Report on Form 10-K (Annual Report) as filed with the SEC, on March 6, 2018.

Revenue

To date we have not generated any revenue from the sale of our products. We generate revenue through research, collaboration and license arrangements with our strategic partners.

Effective January 1, 2018, we adopted accounting Standard Update ("ASU") No. 2014-09, Revenue from Contracts with Customers ("Topic 606") using the modified retrospective approach. Our collaboration agreements with Regeneron, Editas and GenSight were impacted by the adoption of the new revenue standards under Topic 606. Results for reporting periods beginning after January 1, 2018 are presented under Topic 606, while prior period results are not adjusted and continue to be reported in accordance with the revenue standards under Topic 605.

Upon adoption of Topic 606, we recorded a net decrease of $6.1 million to our deferred revenue and opening accumulated deficit as of January 1, 2018 for the cumulative effect of the adoption. The effect of the adoption is summarized for our license and collaboration agreements as follows:

Collaboration Agreement with Regeneron— Under Topic 606, the transaction price at contract inception was determined to be $8.0 million, which was related to the non-refundable upfront payment for license and research services. The arrangement also provides for additional payments to us when certain development and regulatory milestones are achieved. Because these milestone payments are not within our control and are not considered probable of being achieved until the events occur, we did not include them in the transaction price at contract inception. The transaction price of $8.0 million at contract inception was allocated to two performance obligations. Our deferred revenue associated with Regeneron collaboration agreement as of December 31, 2017 under Topic 605 was $6.5 million. As a result of adopting Topic 606, we recorded a $6.5 million reduction to our deferred revenue and opening accumulated deficit during the three months ended March 31, 2018 as the performance obligations associated with the Regeneron deferred revenue were satisfied as of January 1, 2018. There was no outstanding deferred revenue associated with Regeneron as of September 30, 2018.

Collaboration Agreement with Editas— Under Topic 606, the transaction price is $1.5 million related to the $1.0 million non-refundable upfront payment for license and research services at contract inception and the one-time, non-refundable cash payment of $0.5 million made by Editas in February 2018 in consideration for extending the agreement. The arrangement provides for additional payments to us when certain development and regulatory milestones are achieved. Because these milestone payments are not within our control and are not considered probable of being achieved until the events occur, we did not include them in the transaction price. The transaction price of $1.5 million was allocated to a single performance obligation, research and development. Our deferred revenue associated with Editas collaboration agreement as of December 31, 2017 under Topic 605 was $0.5 million. As a result of adopting Topic 606, we recorded an increase of $0.4 million to our deferred revenue and opening accumulated deficit during the three months ended March 31, 2018 due to differences in the timing of recognition under Topic 606.

During the three and nine months ended September 30, 2018, we recognized revenue of $0.6 million and $1.3 million, respectively, associated with the Editas collaboration agreement. Our deferred revenue balance of $0.1 million as of September 30, 2018 was associated with Editas and is expected to be recognized over a period of one month as the research and development services are performed.

License Agreement with GenSight— On February 2014, we entered into an agreement with GenSight, where we granted GenSight a non-exclusive license to our proprietary AAV.7m8 vector. Under the agreement, we are eligible to receive development, regulatory and commercial milestones. Also, we are eligible to receive low to mid-single digit royalties on sales of GenSight's licensed products.

During the three months ended September 30, 2018, GenSight achieved a clinical development milestone pursuant to the agreement. This milestone was previously constrained under Topic 606. We earned a $0.2 million milestone payment, which was recognized as revenue in the consolidated statement of operations and comprehensive loss for the three months ended September 30, 2018.

Under Topic 605, our revenue for the three and nine months September 30, 2018 would have been $0.5 and $1.6 million, respectively.

Results of Operations

Comparison of the Three and Nine Months Ended September 30, 2018 and 2017

	Three Months Ended September 30,			Nine Months Ended September 30,		
	2018	2017	Change	2018	2017	Change
			(In thousands)			
Collaboration and license revenue	$ 833	$ 463	$ 370	$ 1,542	$ 1,388	$ 154
Operating expenses:						
Research and development	14,480	10,272	4,208	38,491	27,825	10,666
General and administrative	4,826	4,762	64	19,373	16,815	2,558
Impairment of intangible asset	5,000	—	5,000	5,000	—	5,000
Total operating expenses	24,306	15,034	9,272	62,864	44,640	18,224
Operating loss	(23,473)	(14,571)	(8,902)	(61,322)	(43,252)	(18,070)
Other income, net	1,265	742	523	3,104	1,894	1,210
Net loss before income tax benefit	(22,208)	(13,829)	(8,379)	(58,218)	(41,358)	(16,860)
Income tax benefit	1,250	—	1,250	1,250	—	1,250
Net loss	$ (20,958)	$ (13,829)	$ (7,129)	$ (56,968)	$ (41,358)	$ (15,610)

Revenue

Our revenue for the three and nine months ended September 30, 2018 was related to research services under our collaboration agreement with Editas and milestone payment under the license agreement with GenSight while our revenue for the three and nine months ended September 30, 2017 was related to license and research services under our collaboration agreements with Regeneron and Editas. We recognized our collaboration and license revenue for the three and nine months ended September 30, 2018 under Topic 606, which we adopted effective January 1, 2018. We recognized our collaboration and license revenue for the three and nine months ended September 30, 2017 under Topic 605. Under Topic 605, our revenue for the three and nine months September 30, 2018 would have been $0.5 million and $1.6 million, respectively.

Research and Development Expense

Research and development expense increased to $14.5 million for the three months ended September 30, 2018, from $10.3 million for the three months ended September 30, 2017. This increase was primarily due to an overall increase in research and development activity, including $1.5 million of higher costs associated with our ADVANCE study for ADVM-043 for A1AT deficiency and start-up activities for our planned OPTIC Phase 1 clinical trial for ADVM-022 for the treatment of wet AMD, $0.6 million of higher material production costs related to our wet AMD and rare disease programs to support our plans to initiate clinical trials, $0.6 million of higher outside research and development services and $1.6 million in higher compensation and benefits.

Research and development expense increased to $38.5 million for the nine months ended September 30, 2018, from $27.8 million for the nine months ended September 30, 2017. This increase was primarily due to an overall increase in research and development activity, including $4.1 million of higher compensation and benefits, $3.3 million of higher material production costs related to our wet AMD and rare disease programs to support our plans to initiate clinical trials, $2.5 million of higher costs associated with our ADVANCE study for ADVM-043 for A1AT deficiency and start-up activities for our planned OPTIC Phase1 clinical trial for ADVM-022 for the treatment of wet AMD, and $1.8 million of higher outside research and development services, offset in part by $0.9 million decrease in consulting costs.

For the periods presented, our research and development activities are attributable to our rare disease and wet AMD programs and earlier-stage research programs. We expect that research and development expenses will increase in future periods as we continue to invest in advancing our gene therapy programs and earlier-stage research programs.

General and Administrative Expense

General and administrative expense remained relatively flat at $4.8 million for the three months ended September 30, 2018 and for the three months ended September 30, 2017.

General and administrative expense increased to $19.4 million for the nine months ended September 30, 2018, from $16.8 million for the nine months ended September 30, 2017. The increase in general and administrative expense was primarily due to $5.0 million in severance-related expenses, predominantly stock-based compensation expenses as a result of the modification of the vesting and exercisability of stock awards associated with the departure of our previous chief executive officer, and $0.4 million in increased compensation costs, partially offset by lower legal expenses as the nine months ended September 30, 2017 included settlement costs associated with the securities class action lawsuit and $2.0 million for the termination of our master service agreement with Cornell.

We expect that general and administrative expenses will increase in future periods as we continue to support advancing our gene therapy programs. We anticipate increased expenses related to audit, legal and regulatory functions, as well as director and officer insurance premiums and investor relations costs associated with being a public reporting company.

Impairment of Intangible Assets

During the three and nine months ended September 30, 2018, the Company identified an impairment indicator related to the intangible asset for ADVM-043 and performed an impairment analysis. On October 30, 2018, the Company decided to discontinue the development of ADVM-043. The Company recorded an impairment charge of $5.0 million on IPR&D assets related to the Company's intangible asset for ADVM-043. There were no impairment charges during the three and nine months ended September 30, 2017.

Other Income, Net

The increase in other income, net was primarily due to higher interest income from our investments in marketable securities as we invested in higher yield securities, as well as higher average invested balances.

Income Tax Benefit

In connection with this impairment charge, the Company derecognized a deferred tax liability of $1.3 million related to the intangible asset for ADVM-043. There was no income tax benefit during the three and nine months ended September 30, 2017.

Liquidity and Capital Resources and Plan of Operations

We have not generated positive cash flow or net income from operations since our inception and as of September 30, 2018, we had an accumulated deficit of $304.9 million. As of September 30, 2018, we had $217.9 million in cash, cash equivalents and short-term investments compared to $190.5 million as of December 31, 2017. We believe that our existing cash and cash equivalents as of September 30, 2018 will be sufficient to fund our operations at least through the first half of 2020.

In August 2017, we entered into the 2017 stock offering agreement. Under the terms and conditions of the 2017 stock offering agreement, we may offer to sell our common stock for an aggregate offering price of up to $50.0 million through the agent from time to time. In January 2018, we sold a total of 1,419,893 shares of our common stock at market prices under the 2017 stock offering agreement and raised total net proceeds of $5.7 million, after issuance costs. Since then, during the nine months ended September 30, 2018, we have sold no additional shares under the 2017 stock offering agreement. We have sold a total of 6,550,232 million shares of our common stock at market prices pursuant to the 2017 stock offering agreement, raising total net proceeds of $22.5 million, after issuance costs.

In February 2018, we completed an underwritten public offering for the sale of 10,222,235 shares of our common stock and raised total net proceeds of $64.5 million, after discounts and other issuance costs.

In June 2018, we entered into a lease for a facility located in Redwood City, California, that will serve as our new corporate headquarters and will include over 80,000 square feet of office, manufacturing, and laboratory space. We believe this facility will enable us to expand our manufacturing process development activities at the 2000-liter scale, as well as offer the opportunity for future cGMP manufacturing of our clinical trial material.

We expect to incur substantial expenditures in the foreseeable future for the development and potential commercialization of our product candidates and ongoing internal research and development programs, and expenses to build out our new facility. At this time, we cannot reasonably estimate the nature, timing or aggregate amount of costs for our development, potential commercialization, and internal research and development programs. However, in order to complete our planned preclinical trials and current and future clinical trials, and to complete the process of obtaining regulatory approval for our product candidates, as well as to build the sales, marketing and distribution infrastructure that we believe will be necessary to commercialize our product candidates, if approved, we will require substantial additional funding in the future.

If and when we seek additional funding, we will do so through equity or debt financings, collaborative or other arrangements with corporate sources or through other sources of financing. Adequate additional funding may not be available to us on acceptable terms or at all. Our failure to raise capital in the future could have a negative impact on our financial condition and our ability to pursue our business strategies. To complete development and commercialization of any of our product candidates, we anticipate that we will need to raise substantial additional capital, the requirements of which will depend on many factors, including:

- the initiation, progress, timing, costs and results of preclinical studies and any clinical trials for our product candidates;
- the outcome, timing of and costs involved in, seeking and obtaining approvals from the FDA and other regulatory authorities, including the potential for the FDA and other regulatory authorities to require that we perform more studies than those that we currently expect;
- the ability of our product candidates to progress through clinical development activities successfully;
- our need to expand our research and development activities;
- the rate of progress and cost of our commercialization of our products;
- the cost of preparing to manufacture our products on a larger scale;
- the costs of commercialization activities including product sales, marketing, manufacturing and distribution;
- the degree and rate of market acceptance of any products launched by us or future partners;
- the costs of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights;
- our need to implement additional infrastructure and internal systems;
- our ability to hire additional personnel;
- our ability to enter into additional collaboration, licensing, commercialization or other arrangements and the terms and timing of such arrangements, and;
- the emergence of competing technologies or other adverse market developments.

If we are unable to raise additional funds when needed, we may be required to delay, reduce, or terminate some or all of our development programs and clinical trials. We may also be required to sell or license other technologies or clinical product candidates or programs that we would prefer to develop and commercialize ourselves.

Cash Flows

	Nine Months Ended September 30,	
	2018	2017
	(in thousands)	
Net cash used in operating activities	$ (41,234)	$ (33,223)
Net cash provided by (used in) investing activities	61,417	(156,895)
Net cash provided by financing activities	69,970	103
Effect of foreign currency exchange rate	—	(442)
Net increase (decrease) in cash and cash equivalents and restricted cash	$ 90,153	$ (190,457)

Cash Used in Operating Activities

During the nine months ended September 30, 2018, net cash used in operating activities was $41.2 million, primarily as a result of the net loss of $57.0 million, partially offset by $18.8 million of non-cash charges mainly related to stock-based compensation expense, impairment of intangible asset and depreciation and amortization expense, and $3.1 million of net decrease in operating assets and liabilities.

During the nine months ended September 30, 2017, net cash used in operating activities was $33.2 million, primarily as a result of the net loss of $41.4 million and $0.7 million of net decrease in operating assets and liabilities, partially offset by $8.9 million of non-cash charges mainly related to stock-based compensation expense and depreciation and amortization expense.

Cash Provided by (Used in) Investing Activities

Net cash provided by investing activities for the nine months ended September 30, 2018 consisted of $118.0 million resulting from the maturities of marketable securities, partially offset by $55.9 million of purchases of marketable securities and $0.7 million of purchases of property and equipment.

Net cash used in investing activities for the nine months ended September 30, 2017, was $156.9 million, primarily due to $201.0 million of purchases of marketable securities and $0.9 million of purchases of property and equipment, partially offset by $45.1 million of maturities of marketable securities.

Purchases of property and equipment primarily consisted of the acquisition of laboratory equipment to support our research and development activities.

Cash Provided by Financing Activities

Net cash provided by financing activities for nine months ended September 30, 2018 consisted of $70.2 million of the net proceeds from the sales of our common stock, $0.8 million of the proceeds from the exercises of stock options and employee stock purchases and $0.1 million of the proceeds from our financing arrangement with the Alpha-1 Project, Inc., partially offset by $1.0 million in taxes paid relating to net share settlement of restricted stock units and $0.1 million repayment of our Banque Publique d'Investissement ("BPI France") loan.

Net cash provided by financing activities of $0.1 million for the nine months ended September 30, 2017 was a result of the proceeds from exercises of stock options, partially offset by taxes paid related to net share settlement of restricted stock units.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations as of September 30, 2018:

	Payment Due by Period				
	Less Than 1 Year	1 to 3 Years	3 to 5 Years	More than 5 Years	Total
	(in thousands)				
Operating lease obligations	$ 2,495	$ 13,674	$ 10,121	$ 24,951	$ 51,241
Master service agreement with Cornell (1)	2,000	—	—	—	2,000
BPI financing	117	215	—	—	332
Contractual obligations (2)	4,120	—	—	—	4,120
Total	$ 8,732	$ 13,889	$ 10,121	$ 24,951	$ 57,693

(1) Costs associated with the termination of the master service agreement with Cornell are recorded within accrued expenses and other current liabilities in our condensed consolidated balance sheet as of September 30, 2018.
(2) Related to our contract manufacturing with a vendor for materials production for our three programs, ADVM-022, ADVM-043 and ADVM-053.

Our contractual obligations have not changed materially from those disclosed in our Annual Report on Form 10-K for the year ended December 31, 2017, except as follows:

In June 2018, we entered into a lease for a facility located in Redwood City, California, that will serve as our new corporate headquarters and will include over 80,000 square feet of office, manufacturing, and laboratory space. We believe this facility will enable us to expand our manufacturing process development activities at the 2000-liter scale, as well as offer the opportunity for future cGMP manufacturing of our clinical trial material.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements as defined in Regulation S-K, Item 303(a)(4)(ii).

Item 3. Quantitative and Qualitative Disclosures about Market Risk

There were not material changes to our exposure to market risk during the nine months ended September 30, 2018. For additional information regarding market risk, refer to the *Qualitative and Quantitative Disclosures About Market Risk* section of our Annual Report on Form 10-K.

Item 4. Controls and Procedures

Evaluation of disclosure controls and procedures. Management, including Leone Patterson, our Chief Executive Officer and Chief Financial Officer, who is currently serving as both our Principal Executive Officer and our Principal Financial Officer, evaluated the effectiveness of our disclosure controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, as of September 30, 2018. The evaluation of our disclosure controls and procedures included a review of our processes and implementation and the effect on the information generated for use in this Quarterly Report on Form 10-Q. This type of evaluation is done quarterly so that our conclusions concerning the effectiveness of these controls can be reported in our periodic reports filed with the SEC. The overall goals of these evaluation activities are to monitor our disclosure controls and procedures and to make modifications as necessary. We intend to maintain these disclosure controls and procedures, modifying them as circumstances warrant.

Based on that evaluation, Ms. Patterson concluded that, as of September 30, 2018, our disclosure controls and procedures were effective to provide reasonable assurance that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is (i) recorded, processed, summarized and reported as and when required and (ii) accumulated and communicated to our management, including the Principal Executive Officer and our Principal Financial Officer, as appropriate to allow timely discussion regarding required disclosure.

Changes in internal control over financial reporting. There have been no changes in our internal control over financial reporting during the three months ended September 30, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations on Controls and Procedures

Our management, including the Principal Executive Officer and Principal Financial Officer, does not expect that our disclosure controls and procedures and our internal controls will prevent all error and all fraud. A control system, no matter how well designed and operated, can only provide reasonable assurances that the objectives of the control system are met. The design of a control system reflects resource constraints; the benefits of controls must be considered relative to their costs. Because there are inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within Adverum have been or will be detected. As these inherent limitations are known features of the financial reporting process, it is possible to design into the process safeguards to reduce, though not eliminate, these risks. These inherent limitations include the realities that judgments in decision-making can be faulty and that breakdowns occur because of simple error or mistake. Controls can be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the control. The design of any system of controls is based in part upon certain assumptions about the likelihood of future events. While our disclosure controls and procedures are designed to provide reasonable assurance of achieving their objectives, there can be no assurance that any design will succeed in achieving its stated goals under all future conditions. Over time, controls may become inadequate because of changes in conditions or deterioration in the degree of compliance with the policies or procedures. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

We intend to review and evaluate the design and effectiveness of our disclosure controls and procedures on an ongoing basis, to improve our controls and procedures over time and to correct any deficiencies that we may discover in the future. While our Principal Executive Officer and Principal Financial Officer concluded that, as of September 30, 2018, the design of our disclosure controls and procedures, as defined in Rule 13a-15(e) under the Exchange Act, was effective, future events affecting our business may cause us to significantly modify our disclosure controls and procedures.

PART II – OTHER INFORMATION

Item 1. Legal Proceedings

There have been no material changes from the legal proceedings described in our quarterly report on Form 10-Q for the period ended June 30, 2018.

Item 1A. Risk Factors

Risks facing our business have not changed substantively from those discussed in our Annual Report on Form 10-K for the year ended December 31, 2017, except for those risk factors below designated by an asterisk (*). You should consider carefully the risks and uncertainties described below, together with all of the other information in this Quarterly Report on Form 10-Q. If any of the following risks are realized, our business, financial condition, results of operations and prospects could be materially and adversely affected. The risks described below are not the only risks facing us. Risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition, results of operations and prospects.

Risks Related to Our Financial Position and Need for Capital

We have incurred significant operating losses since inception, and we expect to incur significant losses for the foreseeable future. We may never become profitable or, if achieved, be able to sustain profitability.

We have incurred significant operating losses since we were founded in 2006 and expect to incur significant losses for the foreseeable future as we continue development of our product candidates. As of September 30, 2018, we had an accumulated deficit of $304.9 million. Losses have resulted principally from costs incurred in our research and development programs and from our general and administrative expenses. In the future, we intend to continue to conduct research and development, clinical testing, regulatory compliance activities and, if any of our product candidates is approved, sales and marketing activities that, together with anticipated general and administrative expenses, will likely result in us incurring significant losses for the next several years.

We currently generate no revenue from sales, and we may never be able to commercialize any of our product candidates. We do not currently have the required approvals to market any of our product candidates, and we may never receive such approvals. We may not be profitable even if we or any of our future development partners succeed in commercializing any of our product candidates. Because of the numerous risks and uncertainties associated with developing and commercializing our product candidates, we are unable to predict the extent of any future losses or when we will become profitable, if at all.

We expect that our cash and cash equivalents will be sufficient to fund our lead gene therapy programs at least through the first half of 2020. If this expectation proves to be wrong, we may be forced to delay, limit or terminate certain of our development efforts.

As of September 30, 2018, our cash, cash equivalents and short-term investments were approximately $217.9 million. We currently expect this cash, cash equivalents and short-term investments to fund our planned operations at least through the first half of 2020. However, this estimate is based on a number of assumptions that may prove to be wrong, including our expectations about the timing of planned clinical trials and expected expenses to be incurred in connection with the build out of our new facility, and changing circumstances beyond our control may cause capital to be consumed more rapidly than currently anticipated. As a result, our operating plan may change, and we may need to seek additional funds sooner than planned, through collaboration agreements and public or private financings. If we run low on capital before we are able to achieve meaningful clinical data for some or all of our product candidates, we may be unable to successfully raise additional funds, and, consequentially, may need to significantly curtail some or all of our development activities.

We will need to raise additional funding, which may not be available on acceptable terms, or at all. If we fail to obtain additional capital necessary to fund our operations, we will be unable to successfully develop and commercialize our product candidates.

We will require substantial future capital in order to complete the preclinical and clinical development for our product candidates and potentially to commercialize these product candidates. Any future clinical trials of our product candidates would cause an increase in our spending levels, as would other corporate activities. The amount and timing of any expenditure needed to implement our development and commercialization programs will depend on numerous factors, including:

- the type, number, scope, progress, expansion costs, results of and timing of any future preclinical studies and clinical trials of any of our product candidates which we are pursuing or may choose to pursue in the future;
- the need for, and the progress, costs and results of, any additional clinical trials or nonclinical studies of our product candidates we may initiate based on the results of any clinical trials that we may plan or discussions with the FDA, including any additional clinical trials or nonclinical studies the FDA or other regulatory agencies may require evaluating the safety of our product candidates;

- the costs of obtaining, maintaining and enforcing our patents and other intellectual property rights;
- the costs and timing for process development scale up and for obtaining or maintaining manufacturing for our product candidates, including commercial manufacturing if any product candidate is approved;
- the costs and timing of establishing sales and marketing capabilities and enhanced internal controls over financial reporting;
- the terms and timing of establishing collaborations, license agreements and other partnerships;
- costs associated with any new product candidates that we may develop, in-license or acquire;
- the effect of competing technological and market developments;
- our ability to establish and maintain partnering arrangements for development; and
- the costs associated with being a public company.

Some of these factors are outside of our control. We do not expect our existing capital resources to be sufficient to enable us to fund the completion of our clinical trials and remaining development program through commercial introduction. We expect that we will need to raise additional funds in the future.

We have not sold any products, and we do not expect to sell or derive revenue from any product sales for the foreseeable future. We may seek additional funding through collaboration agreements and public or private financings. Additional funding may not be available to us on acceptable terms or at all and the terms of any financing may adversely affect the holdings or the rights of our stockholders. In addition, the issuance of additional shares by us, or the possibility of such issuance, may cause the market price of our shares to decline.

If we are unable to obtain funding on a timely basis, we will be unable to complete any future clinical trials for our product candidates and we may be required to significantly curtail some or all of our activities. We also could be required to seek funds through arrangements with collaborative partners or otherwise that may require us to relinquish rights to our product candidates or some of our technologies or otherwise agree to terms unfavorable to us.

Risks Related to the Discovery and Development of Our Product Candidates

Our business will depend substantially on the success of one or more of our product candidates. If we are unable to develop, obtain regulatory approval for, or successfully commercialize, any or all of our product candidates, our business will be materially harmed.

Our product candidates are in the early stages of development and will require substantial preclinical and clinical development and testing, manufacturing process improvement and validation, bridging studies and regulatory approval prior to commercialization. For ADVM-022, we plan to initiate the OPTIC Phase 1 trial in patients with wet AMD in the fourth quarter of 2018. For our rare disease programs, we are planning to conduct additional preclinical studies to determine the best gene therapy candidate to advance in development. It is critical to our business to successfully develop and ultimately obtain regulatory approval for one or more of these product candidates. Our ability to commercialize our product candidates effectively will depend on several factors, including the following:

- successful completion of preclinical studies and clinical trials, including the ability to demonstrate safety and efficacy of our product candidates;
- receipt of marketing approvals for any future products for which we complete clinical trials, including securing regulatory exclusivity to the extent available;
- establishing commercial manufacturing capabilities, for example, by engaging third-party manufacturers that can provide products and services to support clinical development and the market demand for our product candidates, if approved;
- successfully launching and commercial sales of the product, whether alone or in collaboration with potential partners;
- acceptance of the product as a viable treatment option by patients, the medical community and third-party payers;
- establishing market share while competing with other therapies;
- a continued acceptable safety profile of our products following regulatory approval;
- maintaining compliance with post-approval regulation and other requirements; and
- qualifying for, identifying, registering, maintaining, enforcing and defending intellectual property rights and claims covering our product candidates.

If we, or our collaborators, do not achieve one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to commercialize our product candidates, which would materially and adversely affect our business, financial condition, results of operations and prospects.

Moreover, of the large number of biologics and drugs in development in the pharmaceutical industry, only a small percentage result in the submission of a biologics license application ("BLA") to the FDA and even fewer are approved for commercialization. Furthermore, even if we do receive regulatory approval to market any of our product candidates, any such approval may be subject to limitations on the indicated uses for which we may market the product, or limitations related to its distribution. Accordingly, even if we are able to obtain the requisite financing to continue to fund our development programs, there can be no assurance that any of our product candidates will be successfully developed or commercialized. If we or any of our future development partners are unable to

develop, or obtain regulatory approval for, or, if approved, successfully commercialize, any of our product candidates, we may not be able to generate sufficient revenue to continue our business.

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

We have concentrated our research and development efforts on our gene therapy platform and our future success depends on the successful development of product candidates based on this platform. There can be no assurance that any development problems we have experienced or may experience in the future related to our platform will not cause significant delays or unanticipated costs, or that such development problems can be solved. 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 trials or commercializing our products on a timely or profitable basis, if at all.

In addition, the clinical trial requirements of the FDA, the European Medicines Agency ("EMA") and other regulatory agencies and the criteria these regulators may 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 the potential products. The regulatory approval process for novel product candidates such as ours can be more expensive and take longer than for other product candidates, which are better known or more extensively studied to date. As an example, the FDA has only recently approved the first gene therapy product, LUXTURNA™ (voretigene neparvovec-rzyl) for the treatment of patients with confirmed biallelic RPE65 mutation-associated retinal dystrophy. Only recently did the Committee for Medicinal Products for Human Use ("CHMP") of the EMA, adopt a positive opinion recommending approval of LUXTURNA for use in treatment of adult and pediatric patients.

Regulatory requirements governing gene and cell therapy products have changed and may continue to change in the future; such as the National Institutes of Health ("NIH") Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules and the modifications to the roles and responsibilities of the Recombinant DNA Advisory Committee ("RAC"). The FDA decides whether individual gene therapy protocols may proceed, and the FDA can put an IND on clinical hold.

Also, before a clinical study can begin, that clinical site's institutional review board ("IRB") and its Institutional Biosafety Committee will have to review the proposed clinical trial to assess appropriateness to conduct the clinical study at that site. 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 human research on or for approval of any of our product candidates.

These regulatory review committees and advisory groups and the 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 treatment candidates or lead to significant post-approval limitations or restrictions. As we advance our product candidates, we may be required to consult with these regulatory and advisory groups and comply with applicable guidelines or recommendations. If we fail to do so, we may be required to delay or discontinue development of our product candidates. 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 to maintain our business.

We may not be successful in our efforts to identify or discover additional product candidates.

The success of our business depends primarily upon our ability to identify, develop and commercialize products based on our platform. Our research programs, including those conducted through our collaborations with Regeneron and Editas, may fail to identify other potential product candidates for clinical development for a number of reasons. Our research methodology may be unsuccessful in identifying potential product candidates or our potential product candidates may be shown to have lack of efficacy, harmful side effects or may have other characteristics that may make the products unmarketable or unlikely to receive marketing approval.

If any of these events occur, we may be forced to abandon our development efforts for a program or programs, which would have a material adverse effect on our business, financial condition, results of operations, and prospects and could potentially cause us to cease operations. Research programs to identify new product candidates require substantial technical, financial and human resources. We may focus our efforts and resources on potential programs or product candidates that may ultimately prove to be unsuccessful.

Few of our product candidates and proprietary viral vectors have been tested in clinical trials.

Drug development has inherent risk. Few of our product candidates and proprietary viral vectors have been evaluated in clinical trials in patients. We terminated one such trial, the ADVANCE study, and decided to discontinue the development of the associated product candidate ADVM-043, during the fourth quarter of 2018 because preliminary M-specific A1AT protein measurements did not reach clinically meaningful levels of expression, no dose response was observed between the three cohorts and the data did not demonstrate the potential to reach M-protein threshold levels of 11μM. Our current product candidates, including ADVM-022 for the treatment of wet AMD, may experience unexpected results in clinical trials in the future. We, or any licensee or development partner, will be required to demonstrate through adequate and well-controlled clinical trials that our product candidate or another party's product candidate containing one of our proprietary viral vectors are safe and effective for use in their target indications before seeking regulatory approvals for commercial sale. Drug development is a long, expensive and uncertain process, and delay or failure can occur at any stage of development, including after commencement of any of our clinical trials or any clinical trials using our

proprietary viral vectors. Any such delay or failure could significantly harm our business prospects, financial condition and results of operations.

The results of preclinical studies and early clinical trials are not always predictive of future results. Any product candidate we or any of our future development partners advance into clinical trials may not have favorable results in later clinical trials, if any, or receive regulatory approval.

If our product candidates are not shown to be safe and effective, we may not realize the value of our investment in our technology. In addition, success in pre-clinical studies or in early clinical trials does not mean that later clinical trials will be successful, because product candidates in later-stage clinical trials may fail to demonstrate sufficient safety or efficacy despite having progressed through pre-clinical and initial clinical testing. For example, while pre-clinical testing of ADVM-043 showed promise, in the ADVANCE study the preliminary protein level data did not reach a clinically meaningful level of expression and we decided to discontinue development of ADVM-043 in the fourth quarter of 2018. Furthermore, any future trials for any of our product candidates will need to demonstrate sufficient safety and efficacy for approval by regulatory authorities in larger patient populations. Companies frequently suffer significant setbacks in advanced clinical trials, even after earlier clinical trials have shown promising results. In addition, only a small percentage of products under development result in the submission of a marketing application and even fewer are approved for commercialization.

We cannot guarantee that results from any clinical trials that we plan will be successful, and any safety or efficacy concerns observed in any one of our clinical trials in our targeted indications could limit the prospects for regulatory approval of our product candidates in those and other indications.

Preliminary and interim data from our clinical trials that we may announce or publish from time to time may change as each clinical trial progresses.

From time to time, we may announce or publish preliminary or interim data from our clinical trials. Preliminary and interim results of a clinical trial are not necessarily predictive of final results.

Preliminary and interim data are subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues or further patient follow up occurs and more patient data become available. As a result, preliminary and interim data should be viewed with caution until the final data from a locked database are available. Further, patients may discontinue on protocols as specified in a clinical trial protocol. For example, in our ADVANCE study (which was discontinued in the fourth quarter of 2018), per protocol, patients who were previously being treated with standard-of-care weekly IV infusions of A1AT protein were required to wash out for at least two months prior to receiving ADVM-043 and were required to remain off of A1AT protein augmentation therapy for a minimum of three months after dosing with ADVM-043.

Material adverse changes in the final data compared to preliminary or interim data, could significantly harm our business prospects, financial condition and results of operations.

Our product candidates are subject to extensive regulation, compliance with which is costly and time consuming, and such regulation may cause unanticipated delays or prevent the receipt of the required approvals to commercialize our product candidates.

The clinical development, manufacturing, analytical testing, labeling, storage, record-keeping, advertising, promotion, import, export, marketing and distribution of our product candidates are subject to extensive regulation by the FDA and by comparable regulatory authorities in foreign markets. In the U.S., we are not permitted to market our product candidates until we receive regulatory approval from the FDA. The process of obtaining regulatory approval is expensive, often takes many years and can vary substantially based upon the type, complexity and novelty of the products involved, as well as the target indications and patient population. Approval policies or regulations may change, and the regulatory authorities have substantial discretion in the drug approval process, including the ability to delay, limit or deny approval of a product candidate for many reasons. Despite the time and expense invested in clinical development of product candidates, regulatory approval is never guaranteed.

The FDA or comparable foreign regulatory authorities can delay, limit or deny approval of a product candidate for many reasons, including:

- such authorities may disagree with the design or implementation of our or any of our future development partners' clinical trials;
- we or any of our future development partners may be unable to demonstrate to the satisfaction of the FDA or other regulatory authorities that a product candidate is safe and effective for any indication;
- such authorities may not accept clinical data from trials which are conducted at multinational clinical facilities or in countries where the standard of care is potentially different from that of the U.S.;
- the results of clinical trials may not demonstrate the safety or efficacy required by such authorities for approval;
- we or any of our future development partners may be unable to demonstrate that a product candidate's clinical and other benefits outweigh its safety risks;

- such authorities may disagree with our interpretation of data from preclinical studies or clinical trials;
- approval may be granted only for indications that are significantly more limited than what we apply for and/or with other significant restrictions on distribution and use;
- such authorities may find deficiencies in the manufacturing processes, analytical testing, or facilities of third-party manufacturers or testing laboratories with which we or any of our future development partners contract for clinical and commercial supplies; or
- the approval policies or regulations of such authorities may significantly change in a manner rendering our or any of our future development partners' clinical data insufficient for approval.

With respect to foreign markets, approval procedures vary among countries and, in addition to the aforementioned risks, can involve additional product testing, administrative review periods and agreements with pricing authorities. In addition, events raising questions about the safety of related products, including those already on the market, may result in increased cautiousness by the FDA and comparable foreign regulatory authorities in reviewing our product candidates based on safety, efficacy or other regulatory considerations and may result in significant delays in obtaining regulatory approvals. Any delay in obtaining, or inability to obtain, applicable regulatory approvals would prevent us or any of our future development partners from commercializing our product candidates.

If we encounter difficulties enrolling patients in our clinical trials, our clinical development activities could be delayed or otherwise adversely affected.

Identifying and qualifying patients to participate in the OPTIC trial for ADVM-022 for the treatment of wet AMD and any future planned clinical trials will be critical to our success. The timing of current and future clinical trials will depend on the speed at which we can recruit patients to participate in future testing of these product candidates.

Patient enrollment, a significant factor in the timing of clinical trials, is affected by many factors including the size and nature of the patient population, the proximity of patients to clinical sites, the eligibility criteria for the trial, the design of the clinical trial, competing clinical trials and clinicians' and patients' perceptions as to the potential advantages of the product candidate being studied in relation to other available therapies, including any new drugs that may be approved for the indications we are investigating. We will be required to identify and enroll a sufficient number of patients with wet AMD for the OPTIC clinical trial for ADVM-022 and any future clinical trials for our product candidates. Potential patients may not be adequately diagnosed or identified with the diseases which we are targeting or may not meet the entry criteria for our trials. Additionally, some patients may have neutralizing antibodies at titer levels that would prevent them from being enrolled in a clinical trial for any of our product candidates. The incidence of neutralizing antibodies in the population of patients, particularly for rare diseases, is unknown, and may be higher than we expect. As a consequence, enrollment in our clinical trials may be limited or slowed. We also may encounter difficulties in identifying and enrolling patients with a stage of disease appropriate for such future clinical trials. We may not be able to identify, recruit and enroll a sufficient number of patients, or those with required or desired characteristics to achieve diversity in a study.

Rare diseases impact a small number of individuals in the U.S. (fewer than 200,000) and therefore there is a limited patient pool from which to draw for clinical trials. Enrollment of eligible patients with rare or orphan diseases may be limited or slower than we anticipate in light of the small patient populations involved.

We plan to seek initial marketing approval of these product candidates in the U.S. and Europe and we may not be able to successfully conduct clinical trials if we cannot enroll a sufficient number of eligible patients to participate in the clinical trials required by the FDA or the EMA or other regulatory agencies. In addition, the process of finding and diagnosing patients may prove costly.

Further, if patients are unwilling to participate in our gene therapy studies because of negative publicity from adverse events in the biotechnology or gene therapy industries or inadequate results in our preclinical studies or clinical trials or for other reasons, including competitive clinical trials for similar patient populations or available approved therapies, our recruitment of patients, conduct of preclinical studies or clinical trials and ability to obtain regulatory approval of our product candidates may be hindered.

Trials using early versions of retroviral vectors, which integrate into, and thereby alter, the host cell's DNA, have led to several well-publicized adverse events. For example, generalized public backlash developed against gene therapy following the death in September 1999 of an 18-year-old who had volunteered for a gene therapy experiment at the University of Pennsylvania. Researchers at the university had infused the volunteer's liver with a gene aimed at reversing a rare metabolic disease of the liver. The procedure triggered an extreme immune-system reaction that caused multiple-organ failure in a very short time, leading to the first death to occur as a direct result of a gene therapy experiment. In addition, in 2003, 20 patients treated for X-linked severe combined immunodeficiency in two gene therapy studies using a murine gamma-retroviral vector showed correction of the disease, but the studies were terminated after five patients developed leukemia (four of whom were subsequently cured). The cause of these adverse events was shown to be insertional oncogenesis, which is the process whereby the corrected gene inserts near a gene that is important in a critical cellular process like growth or division, and this insertion results in the development of a cancer (often leukemia). Using molecular diagnostic techniques, it was determined that clones from these patients showed retrovirus insertion in proximity to the promoter of the LMO2 proto-oncogene. Earlier generation retroviruses like the one used in these two trials have been shown to

preferentially integrate in regulatory regions of genes that control cell growth. Although none of our current product candidates utilize the gamma-retroviruses used in the 2003 studies, and our vectors are designed not to integrate into the patient's genome, our product candidates do use a viral vector delivery system. If patients negatively associate our product candidates with the adverse events caused by previous gene therapy products, they may not choose to enroll in our clinical trials, which would have a material adverse effect on our business and operations.

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

We believe we have appropriately accounted for the above factors in our trials when determining expected clinical trial timelines, but we cannot assure you that our assumptions are correct or that we will not experience delays in enrollment, which would result in the delay of completion of such trials beyond our expected timelines.

The occurrence of serious complications or side effects in connection with use of our product candidates, either in preclinical studies or clinical trials or post-approval, could lead to discontinuation of our clinical development program, refusal of regulatory authorities to approve our product candidates or, post-approval, revocation of marketing authorizations or refusal to approve new indications, which could severely harm our business prospects, financial condition and results of operations.

During the conduct of preclinical studies and clinical trials, patients may experience changes in their health, including illnesses, injuries and discomforts. Often, it is not possible to determine whether or not the product candidate being studied caused these conditions. Various illnesses, injuries, and discomforts may be reported from time-to-time in clinical trials of our product candidates. It is possible that as we test our product candidates in larger, longer and more extensive clinical programs, or as use of these product candidates becomes more widespread if they receive regulatory approval, illnesses, injuries, discomforts and other adverse events that were observed in earlier trials, as well as conditions that did not occur or went undetected in previous trials, will be reported by patients. Many times, side effects are only detectable after investigational products are tested in large-scale, Phase 3 clinical trials or, in some cases, after they are made available to patients on a commercial scale after approval. If additional clinical experience indicates that one or more of our product candidates has side effects or causes serious or life-threatening side effects, the development of one or more of our product candidates may fail or be delayed, or, if one or more of our product candidates has received regulatory approval, such approval may be revoked, which would severely harm our business prospects, financial condition and results of operations.

Our product candidates built on AAV vectors have similar risks to other gene therapy vectors, including inflammation, cytotoxic T-cell response, anti-AAV antibodies and immune response to the transgene product, such as T-cell responses and/or auto-antibodies against the expressed protein. Recent studies by third parties have also found that intravenous delivery of certain AAV vectors at very high doses may result in adverse events and prompted the recommendation that studies involving high doses of AAV vectors should be monitored carefully for such adverse events. In addition, patients given infusions of any protein may develop severe hypersensitivity reactions, infusion reactions, or serious side effects including transaminitis. With respect to our product candidates that are being or may be studied in diseases of the eye, there are additional potential serious complications related to IVT injection, such as retinal detachment, endophthalmitis, ocular inflammation, cataract formation, glaucoma, hypotony, damage to the retina or cornea, and bleeding in the eye. Serious complications or serious, unexpected side effects in connection with the use of our product candidates could materially harm our business prospects, financial condition and results of operations.

Risks Related to Our Reliance on Third Parties

We will rely on third parties to conduct our planned clinical trials. If these third parties do not meet our deadlines or otherwise conduct the trials as required, our clinical development programs could be delayed or unsuccessful and we may not be able to obtain regulatory approval for or commercialize our product candidates when expected or at all.

We do not have the ability to conduct all aspects of our preclinical testing or clinical trials ourselves. We are dependent on third parties to conduct preclinical studies and clinical trials for our product candidates, and, therefore, the timing of the initiation and completion of these studies or trials is controlled by such third parties and may occur at times substantially different from our estimates. Specifically, we use CROs to conduct our clinical trials and we rely on medical institutions, clinical investigators, CROs and consultants to conduct our trials in accordance with our clinical protocols and regulatory requirements. Our CROs, investigators and other third parties play a significant role in the conduct of these trials and subsequent collection and analysis of data.

There is no guarantee that any CROs, investigators or other third parties on which we rely for administration and conduct of our clinical trials will devote adequate time and resources to such trials or perform as contractually required. If any of these third parties fails to meet expected deadlines, fails to adhere to our clinical protocols, fails to meet regulatory requirements, or otherwise performs in a substandard manner, our clinical trials may be extended, delayed or terminated. If any of our clinical trial sites terminates for any reason, we may experience the loss of follow-up information on patients enrolled in our ongoing clinical trials unless we are able to transfer those patients to another qualified clinical trial site. In addition, principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and may receive cash or equity compensation in connection with such services. If these relationships and any related compensation result in perceived or actual conflicts of interest, or the FDA concludes

that the financial relationship may have affected the interpretation of the study, the integrity of the data generated at the applicable clinical trial site may be questioned and the utility of the clinical trial itself may be jeopardized, which could result in the delay or rejection of any BLA we submit to the FDA. Any such delay or rejection could prevent us from commercializing our product candidates.

We have relied, and expect to continue to rely, on third parties to conduct some or all aspects of our vector production, product manufacturing, product testing, 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, product testing, protocol development, and research, preclinical and clinical testing. We currently rely, and expect to continue to rely, on third parties with respect to these items.

Any of these third parties may not be successful at manufacturing our vector products or may choose to terminate their engagements with us 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. If any of these third parties on which we rely do not perform satisfactorily, we will remain responsible for ensuring that each of our IND-enabling studies and clinical trials are conducted in accordance with the study plan and protocols.

These third parties may 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. If third parties breach their contractual obligations to us, we may not be able to complete, or may be delayed in completing, the preclinical studies and clinical trials required to support future IND submissions, development work, and approval of our product candidates.

Reliance on third-party manufacturers also entails risks to which we would not be subject to 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 bankruptcy of the manufacturer or supplier.

Any of these events could lead to clinical study delays or failure to obtain regulatory approval, or impact our ability to successfully commercialize future products.

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 may have limited capacity.

We currently have relationships with limited number of suppliers for the manufacturing of our vector product candidates. Our suppliers may require licenses to manufacture such components if such processes are not owned by the suppliers 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, and may be unable to acquire such rights, to the extent that we do not already have them. All entities involved in the preparation of therapeutics for clinical trials or commercial sale, including our existing contract manufacturer for our product candidates, are subject to extensive regulation. Components of a finished therapeutic product approved for commercial sale or used in late-stage clinical trials 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 current Good Laboratory Practice regulations and cGMP regulations enforced by the FDA through its facilities inspection program. Our contract manufacturers have not produced a commercially-approved AAV product and therefore have not obtained the requisite FDA approvals to do so. 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 our manufacturing facilities or those of our third-party contractors 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 the facility does not pass a pre-approval plant inspection, FDA approval of the products will 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 or despite 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. Such violations could also result in civil and/or criminal penalties. Any such remedial measures or other civil and/or criminal penalties imposed upon us or third parties with whom we contract could materially harm our business.

If we or 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, revocation of a pre-existing approval, other civil or criminal penalties or closing one or more manufacturing facilities. As a result, our business, financial condition and results of operations may be materially harmed.

Additionally, if supply from an approved manufacturer is interrupted, there could be a significant disruption in commercial supply. An alternative manufacturer would need to be qualified through a BLA supplement which could result in further delay. The regulatory agencies may also require additional studies showing product comparability between the product made after the manufacturing change if a new manufacturer is relied upon for commercial production. Switching manufacturers may involve substantial costs and is likely to result in a delay in our desired clinical and commercial timelines.

These factors could cause the delay of clinical trials, regulatory submissions, required approvals or commercialization of our product candidates, causing us to incur higher costs, and preventing 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 clinical trials may be delayed or we could lose potential revenue.

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 research and develop and to manufacture our product candidates, 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, consulting agreements or other similar agreements with our advisors, employees, third-party contractors 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, including our 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 purposefully or 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 independent 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, financial conditions, results of operations and prospects.

In addition, these agreements typically restrict the ability of our advisors, employees, third-party contractors and consultants to publish data potentially relating to our trade secrets, although our agreements may contain certain limited publication rights. For example, any academic institution that we may collaborate with in the future will usually expect to be granted rights to publish data arising out of such collaboration, provided that we are notified in advance and given the opportunity to delay publication for a limited time period in order for us to secure patent protection of intellectual property rights arising from the collaboration, in addition to the opportunity to remove confidential or trade secret information from any such publication. In the future we may also conduct joint research and development programs that may require us to share trade secrets under the terms of our research and development or similar agreements. Despite our efforts to protect our trade secrets, our competitors may discover our trade secrets, either through breach of our agreements with third parties, independent development or publication of information by any of our third-party collaborators. A competitor's discovery of our trade secrets could impair our competitive position and have an adverse impact on our business, financial condition, results of operations and prospects.

Risks Related to Commercialization of Our Product Candidates

Any suspension of, or delays in the commencement or completion of, clinical trials for our product candidates could result in increased costs to us, delay or limit our ability to generate revenue and adversely affect our commercial prospects.

Before we can initiate clinical trials in the U.S. for our product candidates, we need to submit the results of preclinical testing to the FDA, along with other information including information about product candidate chemistry, manufacturing and controls and our proposed clinical trial protocol, as part of an IND. We may rely in part on preclinical, clinical and quality data generated by CROs and other third parties for regulatory submissions for our product candidates. If these third parties do not provide timely data for our product candidates, it will delay our plans for our IND submissions and clinical trials. If those third parties do not make this data available to us, we will likely have to develop all necessary preclinical and clinical data on our own, which will lead to significant delays and increase development costs of the product candidate. In addition, the FDA may require us to conduct additional preclinical testing for any product candidate before it allows us to initiate clinical testing under any IND, which may lead to additional delays and

increase the costs of our preclinical development. Delays with any regulatory body or agency may significantly affect our product development timeline. Delays in the commencement or completion of any clinical trials that we plan for our product candidates could significantly affect our product development costs. We do not know whether any trials that we plan will begin on time or be completed on schedule, if at all. The commencement and completion of clinical trials can be delayed or terminated for a number of reasons, including delays or terminations related to:

- the FDA failing to grant permission to proceed or placing the clinical trial on hold;
- patients failing to enroll or remain in our trial at the rate we expect;
- patients choosing an alternative treatment for the indication for which we are developing our product candidates, or participating in competing clinical trials;
- lack of adequate funding to continue the clinical trial;
- patients experiencing severe or unexpected drug-related adverse effects;
- a facility manufacturing any of our product candidates or any of their components being ordered by the FDA or other government or regulatory authorities to temporarily or permanently shut down due to violations of cGMP or other applicable requirements, or infections or cross-contaminations of product candidates in the manufacturing process;
- any changes to our manufacturing process that may be necessary or desired;
- third-party clinical investigators losing the licenses or permits necessary to perform our clinical trials, not performing our clinical trials on our anticipated schedule or consistent with the clinical trial protocol, Good Clinical Practice or regulatory requirements or other third parties not performing data collection or analysis in a timely and accurate manner;
- inspections of clinical trial sites by the FDA or the finding of regulatory violations by the FDA or an IRB that require us to undertake corrective action, result in suspension or termination of one or more sites or the imposition of a clinical hold on the entire trial or that prohibit us from using some or all of the data in support of our marketing applications;
- third-party contractors becoming debarred or suspended or otherwise penalized by the FDA or other government or regulatory authorities for violations of regulatory requirements, in which case we may need to find a substitute contractor, and we may not be able to use some or all of the data produced by such contractors in support of our marketing applications; or
- one or more IRBs refusing to approve, suspending or terminating the trial at an investigational site, precluding enrollment of additional patients, or withdrawing its approval of the trial.

Product development costs will increase if we have delays in testing or approval of any of our product candidates, or if we need to perform more or larger clinical trials than planned. Additionally, changes in regulatory requirements and policies may occur, and we may need to amend clinical trial protocols to reflect these changes. Amendments may require us to resubmit our clinical trial protocols to IRBs for review and approval, which may impact the costs, timing or successful completion of a clinical trial. If we experience delays in completion of our clinical trials, or if we, the FDA or other regulatory authorities, the IRB, other reviewing entities, or any of our clinical trial sites suspend or terminate any of our clinical trials, the commercial prospects for a product candidate may be harmed and our ability to generate product revenue will be delayed. In addition, many of the factors that cause, or lead to, termination or suspension of, or a delay in the commencement or completion of, clinical trials may also ultimately lead to the denial of regulatory approval of a product candidate. If we make manufacturing or formulation changes to our product candidates, we may need to conduct additional studies to bridge our modified product candidates to earlier versions. Further, if one or more clinical trials are delayed or terminated, our competitors may be able to bring products to market before we do, and the commercial viability of our product candidates could be significantly reduced.

If we do not achieve our projected development goals in the time frames we announce and expect, the commercialization of our products may be delayed and the credibility of our management team may be adversely affected and, as a result, our stock price may decline.

From time to time, we estimate the timing of the accomplishment of various scientific, clinical, regulatory and other product development goals, which we sometimes refer to as milestones. These milestones may include the commencement or completion of, or the availability of data from, scientific studies and clinical trials and the submission of regulatory filings. From time to time, we may publicly announce the expected timing of some of these milestones. All of these milestones will be based on a variety of assumptions. The actual timing of these milestones can vary dramatically compared to our estimates, in some cases for reasons beyond our control. If we do not meet these milestones as publicly announced, the commercialization of our products may be delayed and the credibility of our management team may be adversely affected and, as a result, our stock price may decline.

Final marketing approval for our product candidates by the FDA or other regulatory authorities for commercial use may be delayed, limited or denied, any of which would adversely affect our ability to generate operating revenue.

After the completion of our clinical trials and, assuming the results of the trials are successful, the submission of a BLA, we cannot predict whether or when we will obtain regulatory approval to commercialize our product candidates, and we cannot, therefore,

predict the timing of any future revenue. We cannot commercialize our product candidates until the appropriate regulatory authorities have reviewed and approved the applicable applications. We cannot assure you that the regulatory agencies will complete their review processes in a timely manner or that we will obtain regulatory approval for our product candidates. In addition, we may experience delays or rejections based upon additional government regulation from future legislation or administrative action or changes in FDA policy during the period of product development, clinical trials and FDA regulatory review. If marketing approval for any product candidate is delayed, limited or denied, our ability to market the product candidate, and our ability to generate product sales, would be adversely affected.

Even if we obtain marketing approval for any of our product candidates, they could be subject to restrictions or withdrawal from the market, and we may be subject to penalties if we fail to comply with regulatory requirements or if we experience unanticipated problems with our product candidates, when and if any of them are approved.

Even if U.S. regulatory approval is obtained, the FDA may still impose significant restrictions on a product's indicated uses, marketing or distribution or impose ongoing requirements for potentially costly and time consuming post-approval studies, post-market surveillance or clinical trials. Following approval, if at all, of any of our product candidates, such candidate will also be subject to ongoing FDA requirements governing the labeling, packaging, storage, distribution, safety surveillance, advertising, promotion, recordkeeping and reporting of safety and other post-market information. In addition, manufacturers of drug products and their facilities are subject to continual review and periodic inspections by the FDA and other regulatory authorities for compliance with cGMP requirements relating to quality control, quality assurance and corresponding maintenance of records and documents. If we or a regulatory agency discovers 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, a regulatory agency may impose restrictions on that product, the manufacturing facility or us, including requesting recall or withdrawal of the product from the market or suspension of manufacturing.

If we or the manufacturing facilities for any product candidate that may receive regulatory approval fail to comply with applicable regulatory requirements, a regulatory agency may:

- issue warning letters or untitled letters;
- seek an injunction or impose civil or criminal penalties or monetary fines;
- suspend or withdraw regulatory approval;
- suspend any ongoing clinical trials;
- refuse to approve pending applications or supplements or applications filed by us;
- suspend or impose restrictions on operations, including costly new manufacturing requirements; or
- seize or detain products, refuse to permit the import or export of product or request us to initiate a product recall.

The occurrence of any event or penalty described above may inhibit our ability to commercialize our product candidates and generate revenue. The FDA has the authority to require a risk evaluation and mitigation strategy plan as part of a BLA or after approval, which may impose further requirements or restrictions on the distribution or use of an approved drug, such as limiting prescribing to certain physicians or medical centers that have undergone specialized training, limiting treatment to patients who meet certain safe-use criteria and requiring treated patients to enroll in a registry.

In addition, if any of our product candidates is approved, our product labeling, advertising and promotion would be subject to regulatory requirements and continuing regulatory review. The FDA strictly regulates the promotional claims that may be made about prescription products. In particular, a product may not be promoted for uses that are not approved by the FDA as reflected in the product's approved labeling. If we receive marketing approval for a product candidate, physicians may nevertheless prescribe it to their patients in a manner that is inconsistent with the approved label. If we are found to have promoted such off-label uses, we may become subject to significant liability. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant sanctions. The federal government has levied large civil and criminal fines against companies for alleged improper promotion and has enjoined several companies from engaging in off-label promotion. The FDA has also requested that companies enter into consent decrees or obtain permanent injunctions under which specified promotional conduct is changed or curtailed.

Even if we receive regulatory approval we still may not be able to successfully commercialize any of our product candidates, and the revenue that we generate from its sales, if any, could be limited.

Even if any of our product candidates receive regulatory approval, they may not gain market acceptance among physicians, patients, healthcare payers or the medical community. Coverage and reimbursement of our product candidates by third-party payers, including government payers, is also generally necessary for commercial success. The degree of market acceptance of our product candidates will depend on a number of factors, including:

- demonstration of clinical efficacy and safety compared to other more-established products;

- the limitation of our targeted patient population and other limitations or warnings contained in any FDA-approved labeling;
- acceptance of new therapeutic options by health care providers and their patients;
- the prevalence and severity of any adverse effects;
- new procedures or methods of treatment that may be more effective in treating or may reduce the incidences of wet AMD, hereditary angioedema, or other conditions for which our products are intended to treat;
- pricing and cost-effectiveness;
- the effectiveness of our or any future collaborators' sales and marketing strategies;
- our ability to obtain and maintain sufficient third-party coverage and reimbursement from government health care programs, including Medicare and Medicaid, private health insurers and other third-party payers;
- unfavorable publicity relating to the product candidate; and
- the willingness of patients to pay out-of-pocket in the absence of third-party coverage and reimbursement.

If any product candidate is approved but does not achieve an adequate level of acceptance by physicians, hospitals, healthcare payers or patients, we may not generate sufficient revenue from that product candidate and may not become or remain profitable. Our efforts to educate the medical community and third-party payers on the benefits of such a product candidate may require significant resources and may never be successful. In addition, our ability to successfully commercialize any of our product candidates will depend on our ability to manufacture our products, differentiate our products from competing products and defend and enforce our intellectual property rights relating to our products.

If the market for the treatment of wet AMD is smaller than we believe it is, our future revenue may be adversely affected, and our business may suffer.

We are advancing the development of ADVM-022 for the treatment of wet AMD, a disease we believe to be the most common cause of vision loss in adults over the age of 50 in developed countries. If the size of the market for wet AMD is smaller than we anticipate, we may not be able to achieve profitability and growth. Our projections of the number of people who have wet AMD, as well as the subset of people with the disease who have the potential to benefit from treatment with ADVM-022, are based on estimates. These estimates have been derived from a variety of sources, including the scientific literature, surveys of clinics, patient foundations and market research and may prove to be incorrect. Further, new studies may change the estimated incidence or prevalence of these diseases. The number of patients may turn out to be lower than expected. The effort to identify patients with diseases we seek to treat is in early stages as we plan to initiate our first clinical study of ADVM-022 for the treatment of wet AMD, and we cannot accurately predict the number of patients for whom treatment might be possible. For example, some patients with wet AMD may have neutralizing antibodies at titer levels that would exclude them from enrolling in our planned Phase I OPTIC trial for ADVM-022. Additionally, the potentially addressable patient population may be limited or may not be amenable to treatment with our product candidates, and new patients may become increasingly difficult to identify or gain access to, which would adversely affect our results of operations and our business.

Because the target patient population for our rare disease programs is relatively small, we must be able to successfully identify patients and achieve a significant market share to maintain profitability and growth. If the market opportunities for these product candidates are smaller than we believe they are, our future revenue may be adversely affected, and our business may suffer.

Our programs designed to treat rare genetic diseases may impact a small number of individuals (fewer than 200,000) in the U.S. Our estimates of both the number of people who have these rare genetic diseases, as well as the subset of people with these diseases who have the potential to benefit from our product candidates, may prove to be incorrect. The number of patients in the U.S. and elsewhere, or the portion of those patients who are amenable to treatment with our product candidates, may turn out to be lower than expected or new patients may become increasingly difficult to identify or gain access to, all of which would adversely affect our results of operations and our business. Further, even if we obtain significant market share for any of our rare disease programs, because the potential target population is very small, we may never achieve profitability despite obtaining such significant market share.

Additionally, because the target patient population for any of our rare disease programs is relatively small, the pricing and reimbursement of these 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 any of our product candidates targeting such rare disease will be adversely affected. The manner and level at which reimbursement is provided for services related to this product candidate (e.g., for administration of such 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 targeting such rare disease.

Coverage and reimbursement may be limited or unavailable in certain market segments for our product candidates, which could make it difficult for us to sell our product candidates profitably.

Market acceptance and sales of our product candidates will depend significantly on the availability of adequate coverage and reimbursement from third-party payers for any of our product candidates and may be affected by existing and future health care reform measures. Government authorities and third-party payers, such as private health insurers and health maintenance organizations, decide which drugs they will pay for and establish reimbursement levels. Reimbursement by a third-party payer may depend upon a number of factors including the third-party payer's determination that use of a product candidate 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.

Obtaining coverage and reimbursement approval for a product candidate from a government or other third-party payer is a time-consuming and costly process that could require us to provide supporting scientific, clinical and cost effectiveness data for the use of the applicable product candidate to the payer. We may not be able to provide data sufficient to gain acceptance with respect to coverage and reimbursement. While there is no uniform coverage and reimbursement policy among payers in the United States, private payers often follow Medicare coverage policy and payment limitations in setting their own reimbursement rates. We cannot be sure that coverage or adequate reimbursement will be available for any of our product candidates. Further, reimbursement amounts may reduce the demand for, or the price of, our product candidates. If reimbursement is not available or is available only in limited levels, we may not be able to commercialize certain of our product candidates profitably, or at all, even if approved.

A number of cell and gene therapy products recently have been approved by the FDA. Although the U.S. Center for Medicare & Medicaid Services ("CMS") approved its first method of coverage and reimbursement for one such product, the methodology has been subject to challenge by members of Congress. CMS's decision as to coverage and reimbursement for one product does not mean that all similar products will be eligible for analogous coverage and reimbursement. As there is no uniform policy for coverage and reimbursement amongst third-party payors in the United States, even if CMS approves coverage and reimbursement for any of our product candidates, it is unclear what affect, if any, such a decision will have on our ability to obtain and maintain coverage and adequate reimbursement from other private payors.

As a result of legislative proposals and the trend toward managed health care in the U.S., third-party payers are increasingly attempting to contain health care costs by limiting both coverage and the level of reimbursement of new drugs. By way of example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively referred to as the Affordable Care Act, was enacted with a goal of reducing the cost of healthcare and substantially changing the way healthcare is financed by both government and private insurers. The Affordable Care Act, among other things, addressed 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, increased the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program, extended the rebate program to individuals enrolled in Medicaid managed care organizations and established annual fees and taxes on manufacturers of certain prescription drugs.

Some of the provisions of the Affordable Care Act have yet to be implemented, and there have been judicial and Congressional challenges to certain aspects of the Affordable Care Act. Since January 2017, President Trump has signed Executive Orders and other directives designed to delay, circumvent or loosen the implementation of certain provisions of the Affordable Care Act or otherwise circumvent some of the requirements for health insurance mandated by the Affordable Care Act. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the Affordable Care Act. While Congress has not passed repeal legislation, the Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Additionally, on January 22, 2018, President Trump signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain Affordable Care Act-mandated fees, including the so-called "Cadillac" tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share, and the medical device excise tax on non-exempt medical devices. Moreover, the Bipartisan Budget Act of 2018, or the BBA, among other things, amends the Affordable Care Act, effective January 1, 2019, to increase from 50 percent to 70 percent the point-of-sale discount that is owed by pharmaceutical manufacturers who participate in Medicare Part D and to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole." Further, in July 2018, CMS announced that it has suspended further collections and payments to and from certain Affordable Care Act qualified health plans and health insurance issuers under the Affordable Care Act risk adjustment program pending the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. Congress may consider other legislation to repeal or replace elements of the Affordable Care Act.

Other legislative changes have also been proposed and adopted in the U.S. since the Affordable Care Act was enacted. On August 2, 2011, the Budget Control Act of 2011 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 included aggregate reductions of Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and due to

subsequent legislative changes to the statute, including the BBA, will stay in effect through 2027 unless additional Congressional action is taken.

These cost reduction initiatives could decrease the coverage and reimbursement that we receive for any approved products, and could seriously harm our business. We expect that additional healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal, state and foreign governments will pay for healthcare products and services, which could result in reduced demand for our products, if approved, or additional pricing pressures.

Recently there has been heightened governmental scrutiny over pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. Such scrutiny has resulted in several recent Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for products. At the federal level, the Trump administration's budget proposal for fiscal year 2019 contains further drug price control measures that could be enacted during the 2019 budget process or in other future legislation, including, for example, measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid, and to eliminate cost sharing for generic drugs for low-income patients. Further, the Trump administration released a "Blueprint" to lower drug prices and reduce out of pocket costs of drugs that contains additional proposals to increase manufacturer competition, increase the negotiating power of certain federal healthcare programs, incentivize manufacturers to lower the list price of their products and reduce the out of pocket costs of drug products paid by consumers. The U.S. Department of Health and Human Services has already started the process of soliciting feedback on some of these measures and, at the same, is immediately implementing others under its existing authority. Although a number of these, and other potential, proposals will require authorization through additional legislation to become effective, Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. At the state level, legislatures are increasingly passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing.

The continuing efforts of the government, insurance companies, managed care organizations and other payers of healthcare services to contain or reduce costs of health care may adversely affect:

- the demand for any product candidates for which we may obtain regulatory approval;
- our ability to set a price that we believe is fair for our product candidates;
- 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.

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 product candidates are designed to provide potential therapeutic benefit after a single administration and, therefore, 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 products.

We are subject to many manufacturing risks, any of which could substantially increase our costs and limit supply of our products. The process of manufacturing our products is complex, highly regulated and subject to several risks, including:

- The manufacturing of biologics is extremely susceptible to product loss due to contamination, equipment failure, improper installation or operation of equipment or vendor or operator error. Even minor deviations from normal manufacturing processes could result in reduced production yields, product defects, and other supply disruptions. If microbial, viral, or other contaminations are discovered in our products or in the manufacturing facility in which our products are made, such manufacturing facility may need to be closed for an extended period of time to investigate and remedy the contamination.
- The manufacturing facilities in which our products are made could be adversely affected by equipment failures, labor shortages, contaminants, raw materials shortages, natural disasters, power failures, and numerous other factors.
- We and our contract manufacturers must comply with the FDA's cGMP regulations and guidelines. We and our contract manufacturers may encounter difficulties in achieving quality control and quality assurance and may experience shortages in qualified personnel. We and our contract manufacturers are subject to inspections by the FDA and comparable agencies in other jurisdictions to confirm compliance with applicable regulatory requirements. Any failure to follow cGMP or other regulatory requirements or any delay, interruption, or other issues that arise in the manufacture, fill-finish, packaging or

storage of our products as a result of a failure of our facilities, or the facilities or operations of third parties, to comply with regulatory requirements or pass any regulatory authority inspection could significantly impair our ability to develop and commercialize our products. This may lead to significant delays in the availability of products for our clinical trials or the termination or hold on a clinical trial, or the delay or prevention of a filing or approval of marketing applications for our product candidates. Significant noncompliance could also result in the imposition of sanctions, including fines, injunctions, civil penalties, failure of regulatory authorities to grant marketing approvals for our product candidates, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of products, operating restrictions, and criminal prosecutions, any of which could be costly and damage our reputation. If we are not able to maintain regulatory compliance, we may not be permitted to market our products and/or may be subject to product recalls, seizures, injunctions or criminal prosecution.

- Our product candidates are biologics and 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 our product candidates generally cannot be adequately characterized prior to manufacturing the final product. As a result, an assay of the finished product is not sufficient to ensure that the product will perform in the intended manner. Accordingly, we expect to employ multiple steps to attempt to control our manufacturing process to assure that the process works, and the product or product candidate is made strictly and consistently in compliance with the process.
- We have to develop the manufacturing process for late stage clinical product, and our current process has not been fully characterized and therefore is open to potential variations that could lead to defective product or a product that does not meet specification.
- Problems with the manufacturing process, even minor deviations from the normal process, could result in product defects or manufacturing failures that result in lot failures, product recalls, product liability claims and insufficient inventory.
- Some of the raw materials required in our manufacturing process are derived from biological sources. Such raw materials are difficult to procure and may also 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 commercialization.
- Any adverse developments affecting manufacturing operations for our products may result in shipment delays, inventory shortages, lot failures, product withdrawals or recalls, or other interruptions in the supply of our products. We may also have to take inventory write-offs and incur other charges and expenses for products that fail to meet specifications, undertake costly remediation efforts, or seek more costly manufacturing alternatives. We may encounter problems achieving adequate or clinical-grade materials that meet FDA, EMA or other applicable standards or specifications with consistent and acceptable production yields and costs.

We may not be successful in establishing and maintaining development or other strategic collaborations, which could adversely affect our ability to develop and commercialize product candidates and receive potential milestone payments.

We have entered into development or other strategic collaborations with major biotechnology or pharmaceutical companies. For example, our research collaboration and license agreement with Regeneron, which was announced in May 2014, covers up to eight distinct therapeutic targets, in which we could earn up to $80.0 million in development and regulatory milestones for product candidates directed toward each therapeutic target, for a combined total of up to $640.0 million in potential milestone payments for product candidates directed toward all eight therapeutic targets, and low- to mid-single digit royalties on worldwide net sales of collaboration product candidates. For any two therapeutic targets, we have an option to share up to 35% of the worldwide product candidate development costs and profits. Additionally, in August 2016, we entered into a collaboration, option, and license agreement with Editas Medicine, pursuant to which we and Editas will collaborate on certain studies using AAV vectors in connection with Editas' genome editing technology, and we will grant to Editas an exclusive option to obtain certain exclusive rights to use our proprietary vectors in up to five ophthalmic indications. If Editas elects to develop a product using certain of our proprietary vectors, we will be eligible to receive up to $5.5 million in development milestone payments and $10.0 million in commercialization milestone payments for such product, and tiered royalties between the mid-single digits and low teens on net sales of such product, subject to certain adjustments.

Research activities under our collaboration agreements are subject to mutually agreed-on research plans and budgets, and if we and our strategic partners are unable to agree on the research plan or research budget in a timely fashion or at all, performance of research activities will be delayed. In addition, some of our strategic partners may terminate any agreements they enter into with us or allow such agreements to expire by their terms. Furthermore, our strategic partners have negotiated for certain rights to control decisions regarding the development and commercialization of our product candidates, if approved, and may not conduct those activities in the same manner as we would.

Moreover, if we fail to maintain development or other strategic collaborations related to our product candidates that we may choose to enter into:

- the development of certain of our current or future product candidates may be terminated or delayed;
- our cash expenditures related to development of certain of our current or future product candidates would increase significantly, and we may need to seek additional financing;
- we may be required to hire additional employees or otherwise develop expertise, such as sales and marketing expertise, for which we have not budgeted; and
- we will bear all of the risk related to the development of any such product candidates.

We may form strategic alliances in the future, and we may not realize the benefits of such alliances.

We may form strategic alliances, create joint ventures or collaborations, or enter into licensing arrangements with third parties that we believe will complement or augment our existing business, including for the continued development or commercialization of our product candidates. These relationships or those like them may require us to incur non-recurring and other charges, increase our near- and long-term expenditures, issue securities that dilute our existing stockholders, or disrupt our management and business. In addition, we face significant competition in seeking appropriate strategic partners and the negotiation process is time-consuming and complex. Moreover, we may not be successful in our efforts to establish a strategic partnership or other alternative arrangements for our product candidates because third parties may view the risk of failure in future clinical trials as too significant, or the commercial opportunity for our product candidate as too limited. We cannot be certain that, following a strategic transaction or license, we will achieve the revenue or specific net income that justifies such transaction. Even if we are successful in our efforts to establish development partnerships, the terms that we agree upon may not be favorable to us, and we may not be able to maintain such development partnerships if, for example, development or approval of a product candidate is delayed or sales of an approved product candidate are disappointing. Any delay in entering into development partnership agreements related to our product candidates could delay the development and commercialization of our product candidates and reduce their competitiveness if they reach the market.

****If our competitors develop treatments for the target indications of our product candidates that are approved, marketed more successfully, or demonstrated to be safer or more effective than our product candidates, our commercial opportunity will be reduced or eliminated.***

We operate in highly competitive segments of the biopharmaceutical markets. We face competition from many different sources, including larger and better-funded pharmaceutical, specialty pharmaceutical, biotechnology, and gene therapy 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 as well as with new treatments that may be introduced by our competitors. There are a variety of drug candidates and gene therapies in development or being commercialized by our competitors for the indications that we intend to test. 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 drugs. In addition, universities and private and public research institutes may be active in our target disease areas, and some could be in direct competition with us. We also may compete with these organizations to recruit management, scientists, and clinical development personnel. We will also face competition from these third parties in establishing clinical trial sites, registering patients for clinical trials, and in identifying and in-licensing new product candidates. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies.

New developments, including the development of other biotechnology and vectorology technologies and methods of treating disease, occur in the pharmaceutical, biotechnology and gene therapy industries at a rapid pace. Developments by competitors may render our product candidates obsolete or noncompetitive. Competition in drug development is intense. We anticipate that we will face intense and increasing competition as new treatments enter the market and advanced technologies become available.

Even if we obtain regulatory approval for 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. For example, Lucentis® and EYLEA are currently available in the U.S. for treatment of wet AMD, diabetic macular edema, central retinal vein occlusion, and diabetic retinopathy. We will not achieve 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 products or choose to reserve our product candidates for use in limited circumstances. Our inability to compete with existing or subsequently introduced drug products or other therapies would have a material adverse impact on our business, prospects, financial condition and results of operations.

Our potential competitors in these diseases may be developing novel immune modulating therapies that may be safer or more effective than our product candidates. For example, if we continue clinical development of, and seek to commercialize, ADVM-022 for the

treatment of wet AMD, it will compete with a variety of therapies currently marketed and in development for wet AMD, using therapeutic modalities such as biologics, small molecules, long acting delivery devices, and gene therapy. Lucentis and EYLEA are anti-VEGF therapies that are well established and widely accepted by physicians, patients and third-party payers as the standard of care for the treatment of wet AMD. There are several other companies with marketed products or products in development for the treatment of wet AMD, including Alcon; Allegro Ophthalmics, LLC; Allergan; Apellis Pharmaceuticals; Graybug Vision, Inc.; Bayer, Hoffmann-La Roche Ltd.; Genentech, Inc.; Iconic Therapeutics, Inc.; Novartis AG; Ophthotech Corporation; Opthea Ltd.; OxfordBioMedica; PanOptica, Inc; Regeneron Pharmaceuticals, Inc.; REGENXBIO, Inc; Santen Pharmaceutical Co., Ltd.; SciFluor Life Sciences, LLC; and Bausch Health Companies, Inc.

We have no sales, marketing or distribution capabilities, and we may have to invest significant resources to develop these capabilities.

We have no internal sales, marketing, or distribution capabilities. If any of our product candidates ultimately receive regulatory approval, we may not be able to effectively market and distribute the product candidate. We may have to invest significant amounts of financial and management resources to develop internal sales, distribution and marketing capabilities, some of which will be committed prior to any confirmation that any of our product candidates will be approved, if at all. We may not be able to hire consultants or external service providers to assist us in sales, marketing and distribution functions on acceptable financial terms or at all. Even if we determine to perform sales, marketing and distribution functions ourselves, we could face a number of additional related risks, including:

- we may not be able to attract and build an effective marketing department or sales force;
- the cost of establishing a marketing department or sales force may exceed our available financial resources and the revenue generated by any product candidates that we may develop, in-license or acquire; and
- our direct sales and marketing efforts may not be successful.

Governments may impose price controls, which may adversely affect our future profitability.

We intend to seek approval to market our product candidates in both the U.S. and in foreign jurisdictions. If we obtain approval in one or more foreign jurisdictions, we will be subject to rules and regulations in those jurisdictions relating to our product candidates. In some foreign countries, particularly in the European Union, the pricing of prescription pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a product candidate. If reimbursement of our future products is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, we may be unable to achieve or sustain profitability.

Risks Related to Our Business Operations

****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 marketing approvals for our product candidates.***

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 symptomatic 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, in 2003, trials using early versions of murine gamma-retroviral vectors, which integrate with, and thereby alter, the host cell's DNA, have led to several well-publicized adverse events, including reported cases of leukemia. Although none of our current product candidates utilize murine gamma-retroviral vectors, our product candidates use a viral delivery system. Adverse events in our clinical trials, even if not ultimately attributable to our product candidates, and the resulting publicity could result in increased governmental regulation, unfavorable public perception, potential regulatory delays in the testing or approval of our product candidates, stricter labeling requirements for those product candidates that are approved and a decrease in demand for any such product candidates. Although none of our current product candidates utilize the gamma-retroviruses used in the 2003 studies, and our vectors are designed not to integrate into the patient's genome, our product candidates do use a viral vector delivery system. The risk of cancer remains a concern for gene therapy and we cannot assure that it will not occur in any of our future clinical trials. In addition, there is the potential risk of delayed adverse events following exposure to gene therapy products due to persistent biological activity of the genetic material or other components of products used to carry the genetic material.

Adverse events in trials or studies conducted by us or other parties, in particular involving the same or similar AAV serotypes to the ones we are using, even if not ultimately attributable to our product candidates or to an AAV serotype that we employ, and resulting

publicity, could result in 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. If any such adverse events occur, development and commercialization of our product candidates or advancement of any potential clinical trials could be halted or delayed, which would have a material adverse effect on our business and operations.

We are dependent on the services of our key executives and clinical and scientific staff, and if we are not able to retain these members of our management or recruit additional management, clinical and scientific personnel, our business will suffer.

We are dependent on the principal members of our management, clinical and scientific staff. The loss of service of any of our management or clinical or scientific staff could harm our business. In addition, we are dependent on our continued ability to attract, retain and motivate highly qualified additional management, clinical and scientific personnel. In particular, our former Chief Executive Officer and Chief Medical Officer left our company in May 2018. Adverum's Board of Directors conducted a thorough search and decided to promote our Interim Chief Executive Officer, Leone Patterson, to Chief Executive Officer and Director. If we are not able to retain our management, and to attract, on acceptable terms, additional qualified personnel necessary for the continued development of our business, including a permanent Chief Medical Officer and a permanent Chief Financial Officer, following Ms. Patterson's promotion to Chief Executive Officer, we may not be able to sustain our operations or grow. Although we have executed employment agreements with each member of our current executive management team, these agreements are terminable at will with or without notice and, therefore, we may not be able to retain their services as expected.

We may not be able to attract or retain qualified management, scientific and clinical personnel in the future due to the intense competition for qualified personnel among biotechnology, pharmaceutical and other businesses, particularly in the San Francisco Bay Area. Our industry has experienced a high rate of turnover of management and scientific personnel in recent years. If we are not able to attract, retain and motivate necessary personnel to accomplish our business objectives, we may experience constraints that will significantly impede the achievement of our development objectives, our ability to raise additional capital and our ability to implement our business strategy. In addition, our current Chief Executive Officer is currently serving in a dual role as Chief Financial Officer, which may result in significant time constraints and burdens on performing each such role.

Additionally, we do not currently maintain "key person" life insurance on the lives of our executives or any of our employees. This lack of insurance means that we may not have adequate compensation for the loss of the services of these individuals.

We may encounter difficulties in managing our growth and expanding our operations successfully.

We had 96 full-time employees as of September 30, 2018. We will need to grow our organization, or certain functions within our organization, substantially to continue development and pursue the potential commercialization of our product candidates, as well as function as a public company. As we seek to advance our product candidates, we may need to expand our financial, development, regulatory, manufacturing, marketing and sales capabilities or contract with third parties to provide these capabilities for us. As our operations expand, we expect that we will need to manage additional relationships with various strategic partners, suppliers and other third parties. Future growth will impose significant added responsibilities on members of management and require us to retain or otherwise manage additional internal capabilities. Our future financial performance and our ability to commercialize our product candidates and to compete effectively will depend, in part, on our ability to manage any future growth effectively. To that end, we must be able to manage our development efforts and clinical trials effectively and hire, train and integrate any additional management, clinical and regulatory, financial, administrative and sales and marketing personnel. We may not be able to accomplish these tasks, and our failure to so accomplish could prevent us from successfully growing our company.

If we fail to comply with applicable state and federal healthcare laws, we may be subject to civil or criminal penalties and/or exclusion from federal and/or state healthcare programs.

In addition to FDA restrictions on the marketing of pharmaceutical products, several other types of state and federal healthcare fraud and abuse laws have been applied in recent years to restrict certain marketing practices in the pharmaceutical industry. These laws include anti-kickback, false claims, physician payment transparency and privacy and security laws and regulations. Because of the breadth of these laws and the narrowness of their exceptions and safe harbors, it is possible that some of our business activities could be subject to challenge under one or more of these laws.

The federal Anti-Kickback Statute prohibits, among other things, knowingly and willfully offering, paying, soliciting or receiving remuneration to induce, or in return for, purchasing, leasing, ordering or arranging for the purchase, lease or order of any healthcare item or service reimbursable under Medicare, Medicaid or other federally financed healthcare programs. Remuneration has been broadly defined to include anything of value, including cash, improper discounts, and free or reduced-price items and services. This statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers and formula managers on the other. Although there are several statutory exceptions and regulatory safe harbors protecting certain common activities from prosecution, the exceptions and safe harbors are drawn narrowly, and practices that involve

remuneration intended to induce prescribing, purchasing or recommending may be subject to scrutiny if they do not qualify for an exception or safe harbor. Many states have similar laws that apply to their state health care programs as well as private payers.

The federal Health Insurance Portability and Accountability Act of 1996 ("HIPAA") created new federal criminal statutes that prohibit among other actions, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private third-party payers; knowingly and willfully embezzling or stealing from a healthcare benefit program; willfully obstructing a criminal investigation of a healthcare offense; and knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. The Affordable Care Act, among other things, amended the intent requirement of the federal Anti-Kickback Statute and certain criminal statutes governing healthcare fraud. A person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it. In addition, the Affordable Care Act provided that the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the False Claims Act.

Additionally, federal false claims laws and the civil monetary penalty law, including the False Claims Act, prohibits knowingly presenting or causing the presentation of a false, fictitious, or fraudulent claim for payment to the U.S. government. Actions under the False Claims Act may be brought by the Attorney General or as a qui tam action by a private individual in the name of the government. Violations of the False Claims Act can result in significant monetary penalties and treble damages. The federal government is using the False Claims Act, and the accompanying threat of significant liability, in its investigation and prosecution of pharmaceutical and biotechnology companies throughout the country, for example, in connection with the promotion of products for unapproved uses and other sales and marketing practices. The government has obtained multi-million and multi-billion dollar settlements under the False Claims Act in addition to individual criminal convictions under applicable criminal statutes. Given the significant size of actual and potential settlements, it is expected that the government will continue to devote substantial resources to investigating healthcare providers' and manufacturers' compliance with applicable fraud and abuse laws.

In addition, there has been a recent trend of increased federal and state regulation of payments made to physicians and other healthcare providers. The Affordable Care Act, among other things, imposes new reporting requirements on drug manufacturers, under the federal Physician Payments Sunshine Act, for payments made by them to physicians and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members. Failure to submit required information may result in significant civil monetary penalties, for all payments, transfers of value or ownership or investment interests that are not timely, accurately and completely reported in an annual submission. Certain states also mandate implementation of commercial compliance programs, impose restrictions on drug manufacturer marketing practices and/or require the tracking and reporting of gifts, compensation and other remuneration to physicians.

The need to build and maintain a robust compliance program with different compliance and/or reporting requirements increases the possibility that a healthcare company may violate one or more of the requirements. If our operations are found to be in violation of any of such laws or any other governmental regulations that apply to us, we may be subject to penalties, including, without limitation, civil and criminal penalties, damages, fines, the curtailment or restructuring of our operations, exclusion from participation in federal and state healthcare programs, imprisonment, and additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, any of which could adversely affect our ability to operate our business and our financial results.

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

Among other matters, Trade Laws prohibit companies and their employees, agents, CRO's, legal counsel, accountants, consultants, contractors, and other partners from authorizing, promising, offering, provide, soliciting, or receiving directly or indirectly, corrupt or improper payments or anything else or anything 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 assessments, 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 engage third parties for clinical trials and/or obtain necessary permits, licenses, registrations, and other regulatory approvals. 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.

If we fail to comply with applicable U.S. and foreign privacy and data protection laws and regulation, we may be subject to liabilities that adversely affect our business, operations and financial performance.

We are subject to or affected by numerous federal, state and foreign laws and regulations, as well as regulatory guidance, governing the collection, use, disclosure, retention, and security of personal data, such as information that we collect about patients and healthcare providers in connection with clinical trials in the U.S. and abroad. The global data protection landscape is rapidly evolving,

and implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future. This evolution may create uncertainty in our business, result in liability or impose additional costs on us. The cost of compliance with these laws, regulations and standards is high and is likely to increase in the future. Any failure or perceived failure by us to comply with federal, state, or foreign laws or self-regulatory standards could result in negative publicity, diversion of management time and effort and proceedings against us by governmental entities or others. In many jurisdictions, enforcement actions and consequences for noncompliance are rising.

For example, HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 ("HITECH"), imposes, among other things, certain standards relating to the privacy, security, transmission and breach reporting of individually identifiable health information, upon health plans, healthcare clearinghouses and certain healthcare providers, and their respective business associates that perform services for them involving individually identifiable health information. In the event we are subject to HIPAA, and fail to properly maintain the privacy and security of certain individually identifiable health information, or we are responsible for an inadvertent disclosure or security breach of such individually identifiable health information, we could be subject to enforcement measures, including civil and criminal penalties and fines for violations of state and federal privacy or security standards, such as HIPAA and HITECH, and their respective implementing regulations. Additionally, certain states have adopted comparable privacy and security laws and regulations, some of which may be more stringent than HIPAA. HIPAA, HITECH and comparable state laws and regulations will be subject to interpretation by various courts and other governmental authorities, thus creating potentially complex compliance issues for us and our future customers and strategic partners. Any liability from failure to comply with the requirements of these laws, to the extent such requirements are deemed to apply to our operations, could adversely affect our financial condition. The costs of complying with privacy and security related legal and regulatory requirements are burdensome and could have a material adverse effect on our results of operations.

Our operations abroad may also be subject to increased scrutiny or attention from data protection authorities. Many countries in these regions have established or are in the process of establishing privacy and data security legal frameworks with which we, our customers, or our vendors must comply. For example, the EU has adopted the General Data Protection Regulation, or GDPR, which went into effect in May 2018 and introduced strict requirements for processing personal data. The GDPR is likely to increase compliance burden on us, including by mandating potentially burdensome documentation requirements, granting certain rights to individuals to control how we collect, use, disclose, retain and leverage information about them. The processing of sensitive personal data, such as physical health condition, may impose heightened compliance burdens under the GDPR and is a topic of active interest among foreign regulators. In addition, the GDPR provides for breach reporting requirements, more robust regulatory enforcement and fines of up to 20 million euros or up to 4% of the annual global revenue. In the United States, California recently enacted the California Consumer Privacy Act ("CCPA"), which takes effect on January 1, 2020. The CCPA gives California residents expanded rights to access and delete their personal information, opt out of certain personal information sharing, and receive detailed information about how their personal information is used. The CCPA provides for civil penalties for violations, as well as a private right of action for data breaches that is expected to increase data breach litigation. The CCPA may increase our compliance costs and potential liability. Some observers have noted that the CCPA could mark the beginning of a trend toward more stringent privacy legislation in the U.S., which could increase our potential liability and adversely affect our business. Further, as we continue to expand into other foreign countries and jurisdictions, we may be subject to additional laws and regulations that may affect how we conduct business.

We and our development partners, third-party manufacturer and suppliers use biological materials and may use hazardous materials, and any claims relating to improper handling, storage or disposal of these materials could be time consuming or costly.

We and our development partners, third-party manufacturer and suppliers may use hazardous materials, including chemicals and biological agents and compounds that could be dangerous to human health and safety or the environment. Our operations and the operations of our third-party manufacturers and suppliers also produce hazardous waste products. Federal, state and local laws and regulations govern the use, generation, manufacture, storage, handling and disposal of these materials and wastes. Compliance with applicable environmental laws and regulations may be expensive, and current or future environmental laws and regulations may impair our product development efforts. In addition, we cannot entirely eliminate the risk of accidental injury or contamination from these materials or wastes. We do not carry specific biological or hazardous waste insurance coverage, and our property, casualty and general liability insurance policies specifically exclude coverage for damages and fines arising from biological or hazardous waste exposure or contamination. Accordingly, in the event of contamination or injury, we could be held liable for damages or be penalized with fines in an amount exceeding our resources, and our clinical trials or regulatory approvals could be suspended.

If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit commercialization of our other product candidates.

We face an inherent risk of product liability as a result of the clinical testing of our product candidates and will face an even greater risk if we commercialize our product candidates. For example, we may be sued if our product candidates allegedly caused or cause injury or are found to be otherwise unsuitable during product testing, manufacturing, marketing or sale. Any such product liability

claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product candidate, negligence, strict liability, and a breach of warranties. Claims could also be asserted under state consumer protection acts.

If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit or cease the commercialization of our product candidates.

Even a successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our product candidates;
- injury to our reputation;
- withdrawal of clinical trial participants;
- costs to defend the related litigation;
- a diversion of management's time and our resources;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- loss of revenue;
- the inability to commercialize our product candidates; and
- a decline in our stock price.

We currently hold $5.0 million in product liability insurance, which may not adequately cover all liabilities that we may incur. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise. Our inability to obtain and retain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of our product candidates. Although we plan to maintain such insurance, any claim that may be brought against us could result in a court judgment or settlement in an amount that is not covered, in whole or in part, by our insurance or that is in excess of the limits of our insurance coverage. Our insurance policies will also have various exclusions, and we may be subject to a product liability claim for which we have no coverage. We may have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts.

We and any of our future development partners will be required to report to regulatory authorities if any of our approved products cause or contribute to adverse medical events, and any failure to do so would result in sanctions that would materially harm our business.

If we and any of our future development partners or CROs are successful in commercializing our products, the FDA and foreign regulatory authorities would require that we and any of our future development partners report certain information about adverse medical events if those products may have caused or contributed to those adverse events. The timing of our obligation to report would be triggered by the date we become aware of the adverse event as well as the nature of the event. We and any of our future development partners may fail to report adverse events we become aware of within the prescribed timeframe. We and any of our future development partners may also fail to appreciate that we have become aware of a reportable adverse event, especially if it is not reported to us as an adverse event or if it is an adverse event that is unexpected or removed in time from the use of our products. If we and any of our future development partners fail to comply with our or their reporting obligations, the FDA or a foreign regulatory authority could take action, including criminal prosecution, the imposition of civil monetary penalties, seizure of our products and delay in approval or clearance of future products.

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

In the ordinary course of our business, we, our CROs, and other third parties on which we rely collect and store sensitive data, including legally protected patient health information, personally identifiable information about our employees, intellectual property, and proprietary business information. These applications and data encompass a wide variety of critical information including research and development information and business and financial information.

The secure processing, storage, maintenance, and transmission of this critical information is vital to our operations and business strategy. Despite the implementation of security measures to protect against unauthorized access or disclosure, our internal computer systems and those of our current and any future CROs and other contractors, consultants and collaborators are vulnerable to damage or attacks from computer viruses, unauthorized access, breaches, interruptions due to employee error, malfeasance or other disruptions, lapses in compliance with privacy and security mandates, natural disasters, terrorism, war and telecommunication and electrical failures. While we have not experienced any such material system failure, accident, or security breach to date, any such event could compromise our networks and the information stored there could be accessed by unauthorized parties, publicly disclosed, lost or stolen. We have measures in place that are designed to detect and respond to such security incidents and breaches of privacy and

security mandates. Any such access, disclosure or other loss of information could result in legal claims or proceedings, liability under laws that protect the privacy of personal information, such as the HIPAA, government enforcement actions and regulatory penalties. Unauthorized access, loss or dissemination could also disrupt our operations, including our ability to conduct research and development activities, process and prepare company financial information, manage various general and administrative aspects of our business and damage our reputation, any of which could adversely affect our business. 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. Likewise, we rely on third parties to manufacture our product candidates and conduct clinical trials, and similar events relating to their computer systems could also have a material adverse effect on our business. In addition, there can be no assurance that we will promptly detect any such disruption or security breach, if at all. 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 and the further development and commercialization of our product candidate could be delayed.

We have entered into a new lease for a new corporate, manufacturing, and research headquarters, which may be more costly to build out than we anticipate and may not provide all of the functionality we expect, which could cause us to incur unanticipated costs.

In June 2018, we entered into a lease for a building located in Redwood City, California, which we plan to occupy in the second half of 2019. This facility will serve as our new corporate headquarters and will include over 80,000 square feet of office, manufacturing, and laboratory space. We believe this facility will enable us to expand our manufacturing process development activities at the 2000- liter scale, as well as offer the opportunity for future cGMP manufacturing of our clinical trial material. There can be no assurance that the cost of building out this space will not be significantly more than we expect, or that the functionality of this space will be as we expect. Additionally, since we are not developing this space for commercial manufacturing production, we will continue to rely upon our limited number of suppliers for the manufacturing of our gene therapy products if they are approved.

Business disruptions could seriously harm our future revenue and financial condition and increase our costs and expenses.

Our operations could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or manmade disasters or business interruptions, for which we are predominantly self-insured. We rely on third-party manufacturers to produce our product candidates. Our ability to obtain clinical supplies of our product candidates could be disrupted if the operations of these suppliers are affected by a man-made or natural disaster or other business interruption. The occurrence of any of these business disruptions could seriously harm our operations and financial condition and increase our costs and expenses.

Our employees, independent contractors, principal investigators, CROs, consultants and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

We are exposed to the risk that our employees, independent contractors, principal investigators, CROs, consultants and vendors may engage in misconduct including fraudulent conduct or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct, or disclosure of unauthorized activities to us that violates: (1) FDA regulations, including those laws requiring the reporting of true, complete and accurate information to regulatory authorities, (2) manufacturing standards, (3) federal and state health care fraud and abuse laws and regulations or (4) laws that require the reporting of financial information or data accurately. Specifically, sales, marketing, and business arrangements in the health care industry are subject to extensive laws and regulations intended to prevent fraud, 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. Activities subject to these laws also involve improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter misconduct by employees and other third parties, 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 be in compliance with such 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 civil, criminal and administrative penalties, damages, 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.

Risks Relating to Our Intellectual Property

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

We currently are heavily reliant upon licenses of certain patent rights and proprietary technology 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. These and other licenses may not provide adequate 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, or may contain other limitations on our ability to use such intellectual property or technology. As a result, our ability to develop or commercialize our processes and product candidates may be limited by the terms of such agreements. In addition, we may not be able to prevent competitors from developing and commercializing competitive products to the extent our licenses to patents are non-exclusive or limited with respect to fields of use or territories.

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, which could have a material adverse effect on our business and financial condition, results of operations and prospects.

Our success depends on our ability to protect our intellectual property and our proprietary technologies.

Our commercial success depends in part on our ability to obtain and maintain patent protection and trade secret protection for our product candidates, proprietary technologies, and their uses as well as our ability to operate without infringing upon the proprietary rights of others. There can be no assurance that any of our product candidates will have patent protection, that our patent applications or those of our licensors will result in patents being issued or that issued patents, if any, will afford sufficient protection against competitors with similar technology, nor is there any assurance that the patents issued will not be infringed, designed around or invalidated by third parties. Even issued patents may later be found unenforceable or may be modified or revoked in proceedings instituted by third parties before various patent offices or in courts. The degree of future protection for our proprietary rights is uncertain. Only limited protection may be available and may not adequately protect our rights or permit us to gain or keep any competitive advantage. This failure to properly protect the intellectual property rights relating to our product candidates could have a material adverse effect on our business, financial condition, results of operations and prospects.

Composition-of-matter patents on the biological or chemical active pharmaceutical ingredient are generally considered to be the strongest form of intellectual property protection for pharmaceutical products, as such patents provide protection without regard to any method of use. We cannot be certain that the claims in our patent applications covering composition-of-matter of any of our product candidates will be considered patentable by the U.S. Patent and Trademark Office ("USPTO") and courts in the U.S. or by the patent offices and courts in foreign countries, nor can we be certain that the claims in our issued composition-of-matter patents will not be found invalid or unenforceable if challenged.

Method-of-use patents protect the use of a product for the specified method or for treatment of a particular indication. However, methods of treating human diseases are considered unpatentable in many jurisdictions, and even where available this type of patent does not prevent a competitor from making and marketing a product that is identical to our product for an indication that is outside the scope of the patented method. Moreover, even if competitors do not actively promote their product for our targeted indications, physicians may prescribe these products "off-label." Although off-label prescriptions may infringe or contribute to the infringement of method-of-use patents, the practice is common and such infringement is difficult to prevent or prosecute.

The patent application process is subject to numerous risks and uncertainties, and there can be no assurance that we or any of our future development partners will be successful in protecting our product candidates by obtaining and defending patents. These risks and uncertainties include the following:

- the USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process. There are situations in which noncompliance can result in abandonment or lapse of a patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, competitors might be able to enter the market earlier than would otherwise have been the case;
- patent applications may not result in any patents being issued;
- patents that may be issued or in-licensed may be challenged, invalidated, modified, revoked, circumvented, found to be unenforceable or otherwise may not provide any competitive advantage;
- our competitors, many of whom have substantially greater resources than we do and many of whom have made significant investments in competing technologies, may seek or may have already obtained patents that will limit, interfere with, or eliminate our ability to make, use, and sell our potential product candidates;
- there may be significant pressure on the U.S. government and international governmental bodies to limit the scope of patent protection both inside and outside the U.S. for disease treatments that prove successful, as a matter of public policy regarding worldwide health concerns; and
- countries other than the U.S. may have patent laws less favorable to patentees than those upheld by the U.S. courts, allowing foreign competitors a better opportunity to create, develop and market competing product candidates.

In addition, we rely on the protection of our trade secrets and know-how. Although we have taken steps to protect our trade secrets and know-how, including entering into confidentiality agreements with third parties, and confidential information and inventions agreements with employees, consultants and advisors, we cannot provide any assurances that all such agreements have been duly executed, and third parties may still obtain this information or may come upon this or similar information independently.

Additionally, if the steps taken to maintain our trade secrets are deemed inadequate, we may have insufficient recourse against third parties for misappropriating our trade secrets. If any of these events occurs or if we otherwise lose protection for our trade secrets or proprietary know-how, the value of this information may be greatly reduced.

Claims by third parties that we infringe their proprietary rights may result in liability for damages or prevent or delay our developmental and commercialization efforts.

The biotechnology industry has been characterized by frequent litigation regarding patent and other intellectual property rights. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we are developing product candidates. As the biotechnology industry expands, especially in the field of gene therapy, 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. Because patent applications are maintained in secrecy until the application is published, we may be unaware of third party patents that may be infringed by commercialization of our product candidates. Moreover, because patent applications can take many years to issue, there may be currently-pending patent applications that may later result in issued patents that our product candidates may infringe. In addition, identification of third party patent rights that may be relevant to our technology is difficult because patent searching is imperfect due to differences in terminology among patents, incomplete databases and the difficulty in assessing the meaning of patent claims. Any claims of patent infringement asserted by third parties would be time consuming and could:

- result in costly litigation;
- divert the time and attention of our technical personnel and management;
- cause development delays;
- prevent us from commercializing our product candidates until the asserted patent expires or is held finally invalid or not infringed in a court of law;
- require us to develop non-infringing technology, which may not be possible on a cost-effective basis; or
- require us to enter into royalty or licensing agreements, which may not be available on commercially reasonable terms, or at all.

Others may hold proprietary rights that could prevent our product candidates from being marketed. Any patent-related legal action against us claiming damages and seeking to enjoin commercial activities relating to our product candidate or processes could subject us to potential liability for damages and require us to obtain a license to continue to manufacture or market our product candidates. We cannot predict whether we would prevail in any such actions or that any license required under any of these patents would be made available on commercially acceptable terms, if at all. In addition, we cannot be sure that we could redesign our product candidate or processes to avoid infringement, if necessary. Accordingly, an adverse determination in a judicial or administrative proceeding, or the failure to obtain necessary licenses, could prevent us from developing and commercializing our product candidates, which could harm our business, financial condition, results of operations and prospects.

The patent protection and patent prosecution for some of our product candidates may be dependent on third parties.

While we normally seek to obtain the right to control the prosecution and maintenance of the patents relating to our product candidates, there may be times when the filing and prosecution activities for platform technology patents that relate to our product candidates are controlled by our licensors. For example, we do not have the right to prosecute and maintain the patent rights licensed to us under agreements with Regents, Cornell University, and Virovek Corporation, and our ability to have input into such filing and prosecution activities is limited. If these licensors or any of our future licensors fail to appropriately prosecute and maintain patent protection for patents covering any of our product candidates or companion diagnostic, our ability to develop and commercialize those product candidates and companion diagnostic may be adversely affected and we may not be able to prevent competitors from making, using and selling competing products.

We may be involved in lawsuits to protect or enforce our patents or the patents of our licensors, which could be expensive, time consuming, and unsuccessful. Further, our issued patents could be found invalid or unenforceable if challenged administratively or in court.

If we or any of our future development partners were to initiate legal proceedings against a third party to enforce a patent directed at one of our product candidates, or one of our future product candidates, the defendant could counterclaim that our patent is invalid and/or unenforceable in whole or in part. In patent litigation in the United States, defendant counterclaims alleging invalidity and/or unenforceability are commonplace. Grounds for a validity challenge include an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness or non-enablement. Grounds for an unenforceability assertion could include an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO or made a false or misleading statement during prosecution. Third parties may also raise similar claims before the USPTO, even outside the context of litigation. 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 we and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part,

and perhaps all, of the patent protection on such product candidate. Such a loss of patent protection would have a material adverse impact on our business.

Interference proceedings provoked by third parties or brought by us or declared by the USPTO may be necessary to determine the priority of inventions with respect to our patents or patent applications or those of our licensors. An unfavorable outcome could require us to cease using the related technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms. Our defense of litigation or interference proceedings may fail and, even if successful, may result in substantial costs and distract our management and other employees. In addition, the uncertainties associated with litigation could have a material adverse effect on our ability to raise the funds necessary to continue our clinical trials, continue our research and development programs, license necessary technology from third parties, or enter into development or manufacturing partnerships that would help us bring our product candidates to market.

Even if resolved in our favor, litigation or other legal proceedings relating to our intellectual property rights may cause us to incur significant expenses and could distract our technical and management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to conduct such litigation or proceedings adequately. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could compromise our ability to compete in the marketplace.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions, or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of our common stock.

Patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents.

On September 16, 2011, the Leahy-Smith America Invents Act ("Leahy-Smith Act"), was signed into law. The Leahy-Smith Act includes a number of significant changes to U.S. patent law. These include provisions that affect the way patent applications will be prosecuted and may also affect patent litigation. In particular, under the Leahy-Smith Act, the U.S. transitioned in March 2013 to a "first to file" system in which the first inventor to file a patent application will be entitled to the patent. Third parties are allowed to submit prior art before the issuance of a patent by the USPTO, and we may become involved in post-grant proceedings including opposition, derivation, reexamination, *inter partes* review or interference proceedings challenging our patent rights or the patent rights of others. An adverse determination in any such submission, proceeding or litigation could reduce the scope or enforceability of, or invalidate, our patent rights, which could adversely affect our competitive position.

We may not be successful in obtaining or maintaining necessary rights to our product candidates through acquisitions and in-licenses.

We currently have rights to intellectual property, through licenses from third parties and under patents that we own, to develop our product candidates. Because our programs may require the use of proprietary rights held by third parties, the growth of our business will likely depend in part on our ability to acquire, in-license, or use these proprietary rights. For example, our product candidates may require specific formulations to work effectively and efficiently and the rights to these formulations may be held by others. We may be unable to acquire or in-license any compositions, methods of use, processes, or other third-party intellectual property rights from third parties that we identify as necessary for our product candidates. The licensing and acquisition of third-party intellectual property rights is a competitive area, and a number of more established companies are also pursuing strategies to license or acquire third-party intellectual property rights that we may consider attractive. These established companies may have a competitive advantage over us due to their size, cash resources, and greater clinical development and commercialization capabilities. In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us. We also may be unable to license or acquire third-party intellectual property rights on terms that would allow us to make an appropriate return on our investment.

We sometimes collaborate with U.S. and foreign academic institutions to accelerate our preclinical research or development under written agreements with these institutions. Typically, these institutions provide us with an option to negotiate a license to any of the institution's rights in technology resulting from the collaboration. Regardless of such option, we may be unable to negotiate a license within the specified timeframe or under terms that are acceptable to us. If we are unable to do so, the institution may offer the intellectual property rights to other parties, potentially blocking our ability to pursue our program.

If we are unable to successfully obtain rights to required third-party intellectual property rights or maintain the existing intellectual property rights we have, we may have to abandon development of that program and our business, financial condition, results of operations and prospects could be materially and adversely affected.

We may fail to comply with any of our obligations under existing agreements pursuant to which we license or have otherwise acquired intellectual property rights or technology, which could result in the loss of rights or technology that are material to our business.

Licensing of intellectual property is of critical importance to our business and involves complex legal, business, and scientific issues. Disputes may arise regarding our rights to intellectual property licensed to us from a third party, including but not limited to:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- the sublicensing of patent and other rights;
- our diligence obligations under the license agreement and what activities satisfy those diligence obligations;
- the ownership of inventions and know-how resulting from the creation or use of intellectual property by us, alone or with our licensors and collaborators;
- the scope and duration of our payment obligations;
- our rights upon termination of such agreement; and
- the scope and duration of exclusivity obligations of each party to the agreement.

If disputes over intellectual property and other rights that we have licensed or acquired from third parties prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates.

We may be subject to claims that we have wrongfully hired an employee from a competitor or that we or our employees have wrongfully used or disclosed alleged confidential information or trade secrets of their former employers.

As is common in the biotechnology and pharmaceutical industry, in addition to our employees, we engage the services of consultants to assist us in the development of our product candidates. Many of our employees and consultants were previously employed at, or may have previously provided or may be currently providing consulting services to, other biotechnology or pharmaceutical companies including our competitors or potential competitors. We may become subject to claims that our company, our employees or a consultant inadvertently or otherwise used or disclosed trade secrets or other information proprietary to their former employers or their former or current clients. 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, which could adversely impact our business. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to our management team.

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

We may also be subject to claims that former employees, collaborators or other third parties have an ownership interest in our patents or other intellectual property. We may be subject to ownership disputes in the future 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 these and other claims challenging inventorship or ownership. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

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

If we are able to secure FDA marketing approval for one of our product candidates that is covered by an issued U.S. patent, that patent may be eligible for limited patent term restoration under the Drug Price Competition and Patent Term Restoration Act of 1984 (“Hatch-Waxman Act”). The Hatch-Waxman Act permits a patent restoration term of up to five years as compensation for patent term lost during product development and the FDA regulatory review process. However, we may not be granted an extension because of, for example, 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 restoration 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 business, financial conditions and results of operations may be materially and adversely affected.

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

Our registered or unregistered trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition among potential 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 materially and adversely impact our business, financial condition, results of operations, or prospects.

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

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involve a high degree of technological and legal complexity. Therefore, obtaining and enforcing biopharmaceutical patents is costly, time consuming and inherently uncertain. In addition, Congress may pass patent reform legislation that is unfavorable to us. The Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents we might obtain in the future.

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

Filing, prosecuting, obtaining and defending patents on our product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the U.S. can be less extensive than those in the U.S. 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 U.S. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the U.S., or from selling or importing products made using our inventions in and into the U.S. or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not 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 U.S. 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 and other intellectual property protection, particularly those relating to biopharmaceuticals, 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 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.

Intellectual property rights do not necessarily address all potential threats to our competitive advantage.

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 therapies that are similar to our product candidates but that are not covered by the claims of any patents that we own or have exclusively licensed;
- we or our licensors or future collaborators might not have been the first to make the inventions covered by the issued patent or pending patent application that we own or have exclusively licensed;
- we or our licensors or future collaborators might not have been the first to file patent applications covering certain of our inventions;

- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- any patent applications that we have filed or may file in the future may not lead to issued patents;
- any of the issued patents that we own or have exclusively licensed may be held invalid or unenforceable, as a result of legal challenges by our competitors;
- our competitors might conduct research and development activities in countries where, or for products for which, 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; and
- the patents of others may have an adverse effect on our business.

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

Known third party patent rights could delay or otherwise adversely affect our planned development and sale of product candidates of our programs.

We are aware of patent rights held by third parties that could be construed to cover certain aspects of our product candidates. A patent holder has the right to prevent others from making, using, or selling a drug that incorporates the patented compositions while the patent remains in force. While we believe that third party patent rights will not affect our planned development, regulatory clearance, and eventual marketing, commercial production, and sale of our product candidates, there can be no assurance that this will be the case. In each case, we expect the relevant patent to expire before we commercially introduce such product candidate. In addition, the Hatch-Waxman exemption provided by U.S. patent law permits uses of compounds and biologics in clinical trials and for other purposes reasonably related to obtaining FDA approval of drugs and biologics that will be sold only after patent expiration, so our use of our product candidates in those FDA-related activities does not infringe any patent holder's rights. However, were a patent holder to assert its rights against us before expiration of such patent holder's patent for activities unrelated to seeking FDA approval, the development and ultimate sale of our product candidates could be significantly delayed, and we could incur the expense of defending a patent infringement suit and potential liability for damages for periods prior to the patent's expiration.

Risks Related to Our Common Stock

If we fail to maintain proper and effective internal control over financial reporting in the future, our ability to prepare accurate and timely consolidated financial statements being prepared in accordance with U.S. GAAP could be impaired, which could harm our operating results, investors' views of us and, as a result, the value of our common stock.

Pursuant to Section 404 of the Sarbanes-Oxley Act of 2002 ("Sarbanes-Oxley"), our management is required to report upon the effectiveness of our internal control over financial reporting. When we cease to be an "emerging growth company," which will occur no later than December 31, 2019, unless we have become a smaller reporting company, our independent registered public accounting firm will also be required to attest to the effectiveness of our internal control over financial reporting, and the related report will also be required to be included in our annual reports filed with the SEC. However, for so long as we remain an emerging growth company, we intend to take advantage of an exemption available to companies meeting these criteria from these auditor attestation requirements. Sarbanes-Oxley Section 404 compliance requirements are complex and require significant documentation, testing, and possible remediation. If we (or our auditors if they are required to assess and attest to the effectiveness of our internal control over financial reporting) are unable to conclude that our internal control over financial reporting is effective, investors may lose confidence in our financial reporting, and the trading price of our common stock may decline.

Although we have determined that our internal control over financial reporting was effective as of December 31, 2017, we cannot assure that there will not be material weaknesses in our internal control over financial reporting in the future. Any failure to maintain internal control over financial reporting could severely inhibit our ability to accurately report our financial condition, results of operations, or cash flows. If we are unable to conclude that our internal control over financial reporting is effective, or if our independent registered public accounting firm determines we have a material weakness in our internal control over financial reporting, we could lose investor confidence in the accuracy and completeness of our financial reports, the market price of our common stock could decline, and we could be subject to sanctions or investigations by The Nasdaq Stock Market, the SEC or other regulatory authorities. Failure to implement and maintain effective internal control over financial reporting, including failure to remediate any material weaknesses we or our auditors identify, could also restrict our future access to the capital markets.

The trading price of the shares of our common stock has been and could continue to be highly volatile, and purchasers of our common stock could incur substantial losses.

Our stock price has been and is likely to continue to be volatile. The stock market in general and the market for biotechnology companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular

companies. The market price for our common stock may be influenced by many factors, including those discussed above and others such as:

- our discontinuation of the development of ADVM-043 and the ADVANCE study;
- our plans to conduct additional preclinical studies to determine the best gene therapy candidates in our rare disease programs to advance in development;
- our ability to enroll and dose patients in any clinical trials that are ongoing or we plan to conduct in the future;
- our ability to obtain regulatory approvals for our product candidates and delays or failure to obtain such approvals;
- results of any clinical trials, and the results of trials of our competitors or those of other companies in our market sector;
- regulatory developments in the U.S. and foreign countries;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in the structure of healthcare payment systems, especially in light of current reforms to the U.S. healthcare system;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;
- failure to maintain our existing third-party license and collaboration agreements;
- delays in manufacturing adequate supply of our product candidates;
- adverse publicity relating to the gene therapy market generally, including with respect to other products and potential products in such markets;
- market conditions in the pharmaceutical and biotechnology sectors and issuance of securities analysts' reports or recommendations;
- sales of our stock by insiders and stockholders;
- trading volume of our common stock;
- general economic, industry and market conditions other events or factors, many of which are beyond our control;
- additions or departures of key personnel; and
- intellectual property, product liability or other litigation against us.

In addition, in the past, stockholders have initiated class action lawsuits against biotechnology and pharmaceutical companies following periods of volatility in the market prices of these companies' stock, and similar litigation has been instituted against us. Such litigation could cause us to incur substantial costs and divert management's attention and resources, which could have a material adverse effect on our business, financial condition, results of operations and prospects.

We have been subject to securities class action lawsuits in the past, and could be subject to additional such lawsuits in the future, which could result in substantial losses and may divert management's time and attention from our business.

In the past, we and certain of our former officers were involved in purported securities class action lawsuits, which have since been settled. The purported securities class action lawsuits asserted that the defendants violated the Securities Exchange Act of 1934, as amended, and the Securities Act of 1933, as amended, and alleged that the defendants made materially false and misleading statements and omitted allegedly material information related to, among other things, the Phase 2a clinical trial for AVA-101, a program which has been discontinued, and the prospects of AVA-101. We settled these lawsuits for $13.0 million, of which $1.0 million we contributed to cover our indemnification obligations to the underwriters, and the remainder was contributed by our insurers. Any future litigation of this type could result in payment of damages or settlement fees and diversion of management's attention and resources, any of which could adversely impact our business. Monitoring and defending against legal actions is time-consuming for our management and detracts from our ability to focus fully on our business activities.

Our quarterly operating results may fluctuate significantly.

We expect our operating results to be subject to quarterly fluctuations. Our net loss and other operating results will be affected by numerous factors, including:

- variations in the level of expenses related to our clinical trial and development programs;
- addition or termination of clinical trials;
- any intellectual property infringement lawsuit in which we may become involved;
- regulatory developments affecting our product candidates;
- our execution of any collaborative, licensing or similar arrangements and the timing of payments we may make or receive under these arrangements;
- nature and terms of stock-based compensation grants; and
- derivative instruments recorded at fair value.

If our quarterly operating results fall below the expectations of investors or securities analysts, the price of our common stock could decline substantially. Furthermore, any quarterly fluctuations in our operating results may, in turn, cause the price of our stock to fluctuate substantially.

If we sell shares of our common stock or securities convertible into or exercisable for shares of our common stock in future financings, licensing or collaboration arrangements, or acquisitions, or additional shares under our at-the-market sales agreement, stockholders may experience immediate dilution and, as a result, our stock price may decline.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of equity offerings, licensing, collaboration or similar arrangements, grants and debt financings. We do not have any committed external source of funds. As a result, we may from time to time issue additional shares of common stock or securities convertible into or exercisable for shares of our common stock. We filed a universal shelf registration statement on Form S-3 with the SEC, which was declared effective on August 22, 2017, pursuant to which we registered for sale up to $150.0 million of any combination of our common stock, preferred stock, debt securities, warrants, and/or units from time to time and at prices and on terms that we may determine, including up to $50.0 million of our common stock available for issuance pursuant to our sales agreement with Cowen. Pursuant to the sales agreement, we may offer and sell, from time to time at our discretion, shares of our common stock having an aggregate offering price of up to $50.0 million through Cowen as our sales agent. Under the sales agreement, Cowen may sell the shares by any method permitted by law deemed to be an "at the market" offering as defined in Rule 415 of the Securities Act. We may seek to raise additional capital at any time. In January 2018, we issued and sold a total of 1,419,893 shares of our common stock at market prices under the 2017 stock offering agreement and raised total net proceeds of $5.7 million. We have sold a total of 6,550,232 shares of our common stock at market prices pursuant to the 2017 stock offering agreement and raised total net proceeds of $22.5 million. Further, pursuant to the universal shelf registration statement, in February 2018, we completed the issuance of 10,222,235 shares of our common stock at $6.75 per share in an underwritten public offering for net proceeds to us of $64.5 million. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a holder of our common stock. Debt 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 or other distributions. Furthermore, we may issue common stock as consideration in acquisitions. For example, in May 2016, we issued 14,087,246 shares of our common stock to Annapurna's shareholders as consideration for all of the outstanding shares of Annapurna. If we issue common stock or securities convertible into common stock, our common stockholders would experience additional dilution and, as a result, our stock price may decline.

If we raise additional funds through licensing, collaboration or similar arrangements, we may have to relinquish valuable rights to our technologies, future revenue streams, research and development programs or product candidates or to grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings or other arrangements 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 product candidates that we would otherwise prefer to develop and market ourselves.

Anti-takeover provisions in our charter documents and under Delaware law could make an acquisition of us, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws may delay or prevent an acquisition of us or a change in our management. These provisions include:

- the authorization of the issuance of "blank check" preferred stock, the terms of which may be established and shares of which may be issued without stockholder approval;
- the limitation of the removal of directors by the stockholders;
- a staggered board of directors;
- the prohibition of stockholder action by written consent, thereby requiring all stockholder actions to be taken at a meeting of our stockholders;
- the elimination of the ability of stockholders to call a special meeting of stockholders;
- the ability of our board of directors to accelerate the vesting of outstanding option grants, restricted stock units or other equity awards upon certain transactions that result in a change of control; and
- the establishment of advance notice requirements for nominations for election to the board of directors or for proposing matters that can be acted upon at stockholder meetings.

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. Although we believe these provisions collectively provide for an opportunity to obtain greater value for stockholders by requiring potential acquirers to negotiate with our board of directors, they would apply even if an offer rejected by our board were

considered beneficial by some stockholders. In addition, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors, which is responsible for appointing the members of our management.

We do not intend to pay dividends on our common stock, and, consequently, your ability to achieve a return on your investment will depend on appreciation, if any, in the price of our common stock.

We have never declared or paid any cash dividend on our common stock and do not currently intend to do so for the foreseeable future. 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. Therefore, the success of an investment in shares of our common stock will depend upon any future appreciation in their value. There is no guarantee that shares of our common stock will appreciate in value or even maintain the price at which our stockholders have purchased their shares.

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

We are an emerging growth company, as defined in the JOBS Act, and continue to be an emerging growth company until December 31, 2019. For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies, including not being required to comply with the auditor attestation requirements of Section 404 of Sarbanes-Oxley, reduced disclosure obligations regarding executive compensation and our periodic reports and proxy statements and exemptions from the requirements of holding nonbinding advisory votes on executive compensation and stockholder approval of any golden parachute payments not previously approved. Even after we no longer qualify as an emerging growth company, we will be a "smaller reporting company," beginning in 2019, which would allow us to take advantage of many of the same exemptions from disclosure requirements including not being required to comply with the reduced disclosure obligations regarding executive compensation and our periodic reports and proxy statements. We cannot predict if investors will find our common stock less attractive because we may rely on 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.

We have incurred and will continue to incur significant increased costs as a result of operating as a public company, and our management devotes substantial time to new compliance initiatives.

As a public company, we have incurred and will continue to incur significant legal, accounting and other expenses. We are subject to the reporting requirements of the Exchange Act, which require, among other things, that we file with the SEC annual, quarterly and current reports with respect to our business, results of operations and financial condition. In addition, Sarbanes-Oxley, as well as rules adopted by the SEC and The Nasdaq Global Market that implement provisions of Sarbanes-Oxley, impose significant requirements on public companies, including requiring establishment and maintenance of effective disclosure and financial controls and changes in corporate governance practices. Further, pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, the SEC adopted additional rules and regulations in these areas, such as mandatory "say on pay" voting requirements that will apply to us when we cease to be an emerging growth company. Stockholder activism, the current political environment and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact the manner in which we operate our business in ways we cannot currently anticipate.

The rules and regulations applicable to public companies have substantially increased our legal and financial compliance costs and make some activities more time-consuming and costly. To the extent these requirements divert the attention of our management and personnel from other business concerns, they could have a material adverse effect on our business, financial condition and results of operations and prospects. The increased costs will decrease our net income or increase our net loss, and may require us to reduce costs in other areas of our business or increase the prices of our products or services. For example, we expect these rules and regulations to make it more difficult and more expensive for us to obtain director and officer liability insurance, and we may be required to incur substantial costs to maintain the same or similar coverage. The impact of these requirements could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, our board committees or as executive officers.

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

The trading market for our common stock will depend in part on the research and reports that securities or industry analysts publish about us, our business, our market or our competitors. If one or more of the analysts who covers us downgrades our stock, our stock price would likely decline. If one or more of these analysts ceases to cover us or fails to regularly publish reports on us, interest in our stock could decrease, which could cause our stock price or trading volume to decline.

The comprehensive tax reform bill could adversely affect our business, results of operations and financial condition.

On December 22, 2017, new legislation known as the Tax Cuts and Jobs Act of 2017 was signed into law that significantly revises the Internal Revenue Code of 1986, as amended (the "Code"). The newly enacted federal income tax law, among other things, contains significant changes to corporate taxation, including adoption of a flat 21% corporate tax rate, limitation of the tax deduction for interest expense to 30% of adjusted earnings (except for certain small businesses), limitation of the deduction of net operating losses generated in tax years beginning after December 31, 2017 to 80% of taxable income and elimination of carrybacks of such net operating losses, one time taxation of offshore earnings at reduced rates regardless of whether they are repatriated, current inclusion in U.S. federal taxable income of certain earnings of controlled foreign corporations for tax years beginning after January 1, 2018, mandatory capitalization of research and development expenses beginning in 2022, immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modifying or repealing many business deductions and credits (including reducing the business tax credit for certain clinical testing expenses incurred in the testing of certain drugs for rare diseases or conditions generally referred to as "orphan drugs"). Notwithstanding the reduction in the corporate income tax rate, the overall impact of the new federal tax law is uncertain, and our business, results of operations and financial condition could be adversely affected. In addition, it is uncertain if and to what extent various states will conform to the newly enacted federal tax law. The impact of this tax reform on holders of our common stock is also uncertain and could be adverse. Investors should consult with their legal and tax advisors with respect to this legislation and the potential tax consequences of investing in or holding our common stock.

Our ability to use net operating loss carryforwards and other tax attributes may be limited by the Code.

We have incurred substantial losses during our history and do not expect to become profitable in the near future and we may never achieve profitability. To the extent that we continue to generate taxable losses, unused losses will carry forward to offset future taxable income, if any, until such unused losses expire. As of December 31, 2017, we had U.S. federal net operating loss ("NOL") carryforwards of approximately $53.2 million to offset future federal income. NOLs expire at various years beginning with 2036. As of December 31, 2017, we also had U.S. state NOL carryforwards of approximately $37.8 million to offset future state income. U.S. State NOLs expire at various years beginning with 2036. At December 31, 2017, we also had approximately $44.1 million of foreign net operating loss carryforwards which may be available to offset future foreign income; these carryforwards do not expire.

Under the newly enacted federal income tax law, federal NOLs incurred in 2018 and in future years may be carried forward indefinitely, but the deductibility of such federal net operating NOLs is limited. It is uncertain if and to what extent various states will conform to the newly enacted federal tax law. In addition, under Section 382 of the Code, our ability to utilize NOL carryforwards or other tax attributes, such as research tax credits, in any taxable year may be limited if we experience an "ownership change." Generally, a Section 382 ownership change occurs if there is a cumulative increase of more than 50 percentage points in the stock ownership of one or more stockholders or groups of stockholders who owns at least 5% of a corporation's stock within a specified testing period. Similar rules may apply under state tax laws. In connection with our acquisition of Annapurna in May 2016, we determined that certain NOLs for both federal and state purposes were severely limited and therefore we removed a significant amount of NOLs from our deferred tax assets. In addition, we may have experienced an ownership change as a result of the February 2018 underwritten public offering of our common stock, and may in the future experience ownership changes future offerings or other changes in the ownership of our stock. As a result, the amount of the NOLs and research and credit carryforwards presented in our financial statements could be limited and may expire unutilized.

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

Unregistered Sales of Equity Securities

None.

Use of Proceeds

On August 5, 2014, we completed our IPO and issued 6,900,000 shares of our common stock at an initial offering price of $17.00 per share. The offer and sale of all of the shares in the IPO were registered under the Securities Act pursuant to a registration statement on Form S-1, as amended (File Nos. 333-197133 and 333-197739), which was declared effective by the SEC on July 30, 2014. The joint book-running managers for the IPO were Jefferies LLC, Cowen and Company, LLC, and Piper Jaffray & Co. The aggregate offering price to the public for the shares sold in the IPO was $117.3 million. We received net proceeds from the IPO of approximately $106.5 million, after deducting underwriting discounts and commissions of approximately $8.2 million and expenses of approximately $2.6 million payable by us. None of the expenses associated with the IPO were paid to directors, officers, persons owning 10% or more of any class of equity securities, or to their associates, or to our affiliates.

We have discontinued development of AVA-101, and therefore we will not use approximately $20.0 million of our net proceeds from the IPO to fund Phase 3 research and development startup activities for a future AVA-101 study, as we had described in our final prospectus filed with the SEC on July 31, 2014 pursuant to Rule 424(b) of the Securities Act. Instead, we have reallocated such proceeds to fund research and development expenses for studies for our other gene therapy product candidates.

Item 3. Defaults Upon Senior Securities

None.

Item 4. Mine Safety Disclosures

Not applicable.

Item 5. Other Information

On October 30, 2018, the Board of Directors of Adverum Biotechnologies, Inc. appointed Mehdi Gasmi, Ph.D. as our President, in addition to Dr. Gasmi serving as our Chief Scientific Officer. Adverum first announced Dr. Gasmi's appointment as President on November 8, 2018.

Mehdi Gasmi, Ph.D., age 52, Dr. Gasmi has served as our Chief Science and Technology Officer since February 2017. Previously, he served as our interim Chief Scientific Officer from July 2015 to February 2018, Senior Vice President, Pharmaceutical Development from May 2015 to July 2015, and as Vice President, Pharmaceutical Development from November 2013 to May 2015. From December 2011 to November 2013, as principal of ClinVec Solutions, LLC, Dr. Gasmi provided adeno-associated virus ("AAV") and lentiviral gene therapy consulting services to various companies, including to Adverum, from June 2013 to October 2013. Prior to that, Dr. Gasmi oversaw production of clinical batches of recombinant AAV and lentiviral gene therapy products for both Genethon, a non-profit gene therapy company, where he served as Vice President of Biomanufacturing from July 2009 to December 2011, and for Ceregene, a gene therapy company, where he served as Senior Director, Product Development from December 2001 to June 2009. Dr. Gasmi obtained his M.S. and his Ph.D. in Biochemistry from the Claude Bernard University in Lyon, France.

Item 6. Exhibits

EXHIBIT INDEX

EXHIBIT NUMBER	EXHIBIT DESCRIPTION	INCORPORATED BY REFERENCE				PROVIDED HEREWITH
		FILE NUMBER	FORM	DATE	EXHIBIT NUMBER	
3.1	Amended and Restated Certificate of Incorporation.	001-36579	10-K	March 9, 2017	3.1	
3.2	Amended and Restated Bylaws.	001-36579	8-K	May 12, 2016	3.2	
4.1	Reference is made to Exhibits 3.1 through 3.2.					
4.2	Form of Common Stock Certificate.	333-197133	S-1/A	July 25, 2014	4.1	
10.1	Amber Salzman Separation Agreement					X
10.2	Athena Countouriotis Separation Agreement					X
31.1	Certification of Principal Executive Officer, as required by Rule 13a-14(a) or Rule 15d-14(a).					X
31.2	Certification of Chief Financial Officer, as required by Rule 13a-14(a) or Rule 15d-14(a).					X
32.1*	Certification pursuant to 18 U.S.C. section 1350, as adopted pursuant to section 906 of the Sarbanes-Oxley Act of 2002.					X
101.SCH	XBRL Taxonomy Extension Schema Document.					X

101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.	X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.	X
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.	X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.	X

* The certification attached as Exhibit 32.1 that accompanies this Quarterly Report on Form 10-Q is not deemed filed with the SEC and is not to be incorporated by reference into any filing of Adverum Biotechnologies, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Form 10-Q, irrespective of any general incorporation language contained in such filing.

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.

Date: November 8, 2018

ADVERUM BIOTECHNOLOGIES, INC.

By: /s/ Leone Patterson

Leone Patterson
Chief Executive Officer and Chief Financial Officer
(Principal Executive and Financial Officer)

Exhibit 10.1

Adverum Biotechnologies, Inc. 1035
O'Brien Drive,
Menlo Park, CA 94025 O:
650.272.6269

May 2, 2018

Amber Salzman, Ph.D. Adverum
Biotechnologies, Inc. 1035 O'Brien
Drive
Menlo Park, CA 94025 Dear
Amber:

This letter sets forth the substance of the separation and consulting agreement (the "Agreement") between you and Adverum Biotechnologies, Inc. (the "Company").

1 no i t a r a p e S t n e m o y l p m e t a n i m r e t e t a d l i w e h t y a M g i B e h t a p y e S "r. e h" o s a D a u o Y m o C e h t . e t a D

n o i t a r a p e S e h t n O . , y r a l a s d e d u l c a d e n i a t n o c a v e n i a g e n o h i t a e h t a p e S a , s t e n e f i B d e s o l c s i d l a t t l s l o r y a p . s g n i d l o h h t i w

3 B e n e f i t s a n d S e v e r a n c e o t t n a u s r u P , 9 2 y r a u n a J 6 1 0 2 h t r o f e S "

a. You will receive an amount equal to twelve (12) months of your current base salary, payable in substantially equal installments in accordance with the Company's normal payroll policies, less applicable withholdings; *provided, however*, that no payments under this Section 3(a) shall be made prior to the first payroll date occurring on or after the sixtieth (60th) day following the Separation Date (the "First Payroll Date"), and any amounts otherwise payable prior to the First Payroll Date will be paid on the First Payroll Date without interest thereon.

b. Under the Severance Agreement, you are eligible for one year of paid COBRA premiums from the Company following the Separation Date. However, because you are not currently enrolled in the Company's health care plans, in lieu of paid COBRA, the Company shall continue to pay for your current health care coverage (through the retirement benefit plan from your former employer), for a one year period following the Separation Date, with such payments to be grossed up for taxes (per the existing arrangement).

You acknowledge and agree that upon receipt of the benefits set forth in Section 3, you will have received all severance benefits to which you are entitled, whether under the Severance Agreement or otherwise, and will not be eligible for, and will not receive, any further severance benefits from the Company.

4 g i n s i t l u s n o C u o y f I t a r a p e S h t s e w 6 l e b

a. **Consulting Period.** You will serve as a consultant to the Company beginning on the Separation Date and ending on June 30, 2020 (the "Consulting Period"), unless terminated earlier pursuant to Section 2(h).

b. **Consulting Services.** As a consultant, you will be responsible for assisting the Company in any area of your expertise, as reasonably requested by the Company (the "Consulting Services"), not to exceed one (1) day per week. You will conduct the Consulting Services at a location of your choosing, and will exercise the highest degree of professionalism in performing the Consulting Services.

c. **Equity.** During your employment with the Company, you were granted certain equity interests in the Company. During the Consulting Period, these interests will continue to vest under the existing terms as set forth in the governing equity agreements. All rights and obligations with respect to your equity interests will be as set forth in the applicable agreements, grant notices and plan documents. You are encouraged to obtain independent tax advice concerning your options and how the terms of this Agreement may affect the tax treatment of your interest.

d. **Independent Contractor Status.** You agree that during the Consulting Period, (i) you will be an independent contractor to the Company and not an employee of the Company, and (ii) the Company will not make payments for state or federal income tax, FICA (social security and Medicare), make unemployment insurance or disability insurance contributions, or obtain workers' compensation insurance on your behalf.

e. **Protection of Information.** You agree that during the Consulting Period and thereafter, you will not use or disclose any confidential or proprietary information or materials of the Company that you obtain or develop in the course of performing consulting services for the Company. Any and all work product you create in the course of performing consulting services for the Company will be the sole and exclusive property of the Company. You hereby assign to the Company all right, title, and interest in all inventions, techniques, processes, materials, and other intellectual property developed in the course of performing consulting services for the Company.

f. **Limitations on Authority.** You will have no responsibilities or authority as a consultant to the Company other than as provided above. You agree not to represent or purport to represent the Company in any manner whatsoever to any third party except with my prior written consent.

g. **Standards of Conduct; Noncompetition.** You agree not to engage in any conduct during the Consulting Period that is detrimental to the interests of the Company. You further agree during the Consulting Period that you will not, directly or indirectly, as an officer, director, employee, consultant, owner, manager, member, partner, or in any other capacity solicit, perform, or provide, or attempt to perform or provide Conflicting Services in the United States, nor will you assist another person to solicit, perform or provide or attempt to perform or provide Conflicting Services in the United States. You and the Company agree that for purposes of this Agreement, "Conflicting Services" means any product, service, or process or the research and development thereof, of any person or organization other than the Company that is substantially similar to or competitive with a product, service, or process, including the research and development thereof, of the Company. Notwithstanding the above, you will not be deemed to be engaged directly or indirectly in any Conflicting Services if you participate in any such business solely as a passive investor in up to one percent (1%) of the equity securities of a company or partnership, the securities of which are publicly traded.

h. **Termination of Consulting Period.** Either you or the Company may terminate the Consulting Period, at any time and for any reason, upon thirty (30) days written notice to the other party. If the Company terminates the Consulting Period without Cause, then the Company will accelerate the vesting on your Company equity interests such that you will be deemed vested in all of the shares that would have vested had you remained a consultant through June 30, 2020. For purposes of this Agreement, Cause shall mean: (i) commission of any felony or other crime involving fraud, dishonesty or moral turpitude; (ii) attempted commission of, or participation in, a fraud or act of dishonesty against the Company; or (iii) material violation of any contract or agreement with the Company.

directors and officers liability insurance. Also, excluded from this Agreement are any claims that cannot be waived by law.

6. Unknown Claims. You acknowledge that You have been advised by Employer to discuss all aspects of this Agreement with Your attorney, that You have carefully read and fully understand all of the provisions of this Agreement, and that You are voluntarily entering into this Agreement. You acknowledge that You have been given a period of at least twenty-one (21) days within which to consider this Agreement; that You have carefully read and fully understand all of the provisions of this Agreement; that You have had the opportunity to discuss this Agreement with Your attorney; that You are voluntarily entering into this Agreement; and that You have been given seven (7) days after You sign this Agreement to revoke it. You understand that any revocation within the seven (7) day period must be submitted, in writing, to Employer and state, "I hereby revoke my acceptance of our Agreement and Release." You understand that the revocation must be personally delivered to Employer or mailed and postmarked within seven (7) days after You sign this Agreement. You understand that if You elect not to sign this Agreement within twenty-one (21) days, or if You revoke this Agreement after You sign it, it shall not be effective or enforceable and You will not receive the monies specified in Section 2 above.

7. California Civil Code Section 1542 Waiver. You acknowledge that You have been advised by Employer to discuss all aspects of this Agreement with Your attorney, that You have carefully read and fully understand all of the provisions of this Agreement, and that You are voluntarily entering into this Agreement. You acknowledge that You have been given a period of at least twenty-one (21) days within which to consider this Agreement; that You have carefully read and fully understand all of the provisions of this Agreement; that You have had the opportunity to discuss this Agreement with Your attorney; that You are voluntarily entering into this Agreement; and that You have been given seven (7) days after You sign this Agreement to revoke it. You understand that any revocation within the seven (7) day period must be submitted, in writing, to Employer and state, "I hereby revoke my acceptance of our Agreement and Release." You understand that the revocation must be personally delivered to Employer or mailed and postmarked within seven (7) days after You sign this Agreement. You understand that if You elect not to sign this Agreement within twenty-one (21) days, or if You revoke this Agreement after You sign it, it shall not be effective or enforceable and You will not receive the monies specified in Section 2 above.

“A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor.”

You hereby expressly waive and relinquish all rights and benefits under that section and any law of any other jurisdiction of similar effect with respect to your release of claims herein, including but not limited to your release of unknown claims.

8. No Pending or Future Lawsuits. You represent that You have not filed, caused to be filed, or presently are a party to any claim, complaint, or action against Employer in any forum or form. You further represent that You have no complaints, charges or claims against Employer with any local, state or federal agency, court or tribunal, and that You have no plans to bring any such complaints, charges or claims against Employer.

9. Applicable Law. This Agreement shall be interpreted and enforced under the laws of the State of California, without regard to its conflict of laws provisions.

10. Arbitration. Any dispute or controversy arising out of, relating to, or in connection with this Agreement, including any breach of this Agreement, shall be subject to binding arbitration under the Arbitration Rules set forth in California Code of Civil Procedure Section 1280 through 1294.2, including Section 1281.8 (the “Arbitration Rules”). The arbitration shall be before a retired judge or justice under the auspices of JAMS, with the Arbitrator to be selected in accordance with the Arbitration Rules. The arbitration shall preserve, to the extent permitted by law, the confidentiality of this Agreement. The Arbitrator shall have the power to award any remedies available under applicable law, and the Arbitrator shall award attorneys’ fees and costs to the prevailing party, except that in any arbitration initiated by You pursuant to this Agreement You will be required to pay an amount equivalent to the filing fee you would have paid had you filed a complaint in a court of law. You understand that this provision concerning arbitration is meant to serve as the parties’ final resolution of all disputes between them, and that the Arbitrator’s decision is final and binding on all parties to the fullest extent permitted by law. You understand that You are waiving Your right to a jury trial. You understand that You are waiving Your right to file a lawsuit in any court. You understand that You are waiving Your right to have a judge decide Your claims. You understand that You are waiving Your right to have a jury decide Your claims. You understand that You are waiving Your right to have a judge or jury decide Your claims. You understand that You are waiving Your right to have a judge or jury decide Your claims.

11. Miscellaneous. This Agreement is the entire agreement between You and Employer regarding the subject matter of this Agreement and supersedes any prior agreements or understandings between You and Employer. This Agreement may not be modified except by a written agreement signed by You and Employer. If any provision of this Agreement is found to be invalid or unenforceable, the remaining provisions will remain in full force and effect. This Agreement may be executed in counterparts, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument.

have been entered into and will be construed and enforced in accordance with the laws of the State of California without regard to conflict of laws principles. Any ambiguity in this Agreement shall not be construed against either party as the drafter. Any waiver of a breach of this Agreement shall be in writing and shall not be deemed to be a waiver of any successive breach. This Agreement may be executed in counterparts and facsimile signatures will suffice as original signatures.

If this Agreement is acceptable to you, please sign below and return the original to me. You have twenty-one (21) calendar days to decide whether you would like to accept this Agreement, and the Company's offer contained herein will automatically expire if you do not sign and return it within this timeframe.

We wish you the best in your future endeavors.
Sincerely,

By: /s/Paul Cleveland
Paul Cleveland
Chairman of the Board of Directors

I HAVE READ, UNDERSTAND AND AGREE FULLY TO THE FOREGOING AGREEMENT:

/s/Amber Salzman

Amber Salzman, Ph.D.

2018-05-03 | 07:45:44 PDT

Date

Exhibit 10.2

Adverum Biotechnologies, Inc.
1035 O'Brien Drive,
Menlo Park, CA 94025 O:
650.272.6269

May 8, 2018

Athena Countouriotis Adverum
Biotechnologies, Inc. 1035 O'Brien
Drive
Menlo Park, CA 94025

Dear Athena:

This letter sets forth the substance of the separation and consulting agreement (the "Agreement") between you and Adverum Biotechnologies, Inc. (the "Company").

1. **Separation**. You have tendered your resignation from all positions you hold with the Company effective May 11, 2018 (the "Separation Date").

2. **Accrued Salary and Paid Time Off**. On the Separation Date, the Company will pay you all accrued salary, and all accrued and unused vacation earned through the Separation Date, subject to standard payroll deductions and withholdings.

3. **Consulting.** If you timely sign this Agreement and allow the release set forth herein to become effective, then following the Separation Date, the Company will engage you as a consultant under the terms set forth below.

a. **Consulting Period.** You will serve as a consultant to the Company beginning on the Separation Date and ending on June 30, 2018 (the "Consulting Period"), unless terminated earlier pursuant to Section 2(h).

b. **Consulting Services.** As a consultant, you will be responsible for assisting the Company in any area of your expertise, as reasonably requested by the Company (the "Consulting Services"), approximately one (1) day per week. You will conduct the Consulting Services at a location of your choosing, and will exercise the highest degree of professionalism in performing the Consulting Services.

c. **Equity.** During your employment with the Company, you were granted certain equity interests in the Company summarized in Exhibit A, attached. During the Consulting Period, these interests will continue to vest under the existing terms as set forth in the governing equity agreements. All rights and obligations with respect to your equity interests will be as set forth in the applicable agreements, grant notices and plan documents. You are encouraged to obtain independent tax advice concerning your options and how the terms of this Agreement may affect the tax treatment of your interest.

d. **Independent Contractor Status.** You agree that during the Consulting Period, (i) you will be an independent contractor to the Company and not an employee of the Company, and (ii) the Company will not make payments for state or federal income tax, FICA (social security and Medicare), make unemployment insurance or disability insurance contributions, or obtain workers' compensation insurance on your behalf.

e. **Protection of Information.** You agree that during the Consulting Period and thereafter, you will not use or disclose any confidential or proprietary information or materials of the Company that you obtain or develop in the course of performing consulting services for the Company. Any and all work product you create in the course of performing consulting services for the Company will be the sole and exclusive property of the Company. You hereby assign to the Company all right, title, and interest in all inventions, techniques, processes, materials, and other intellectual property developed in the course of performing consulting services for the Company.

f. **Limitations on Authority.** You will have no responsibilities or authority as a consultant to the Company other than as provided above. You agree not to represent or purport to represent the Company in any manner whatsoever to any third party except with my prior written consent.

g. **Standards of Conduct; Noncompetition.** You agree not to engage in any conduct during the Consulting Period that is detrimental to the interests of the Company. You further agree during the Consulting Period that you will not, directly or indirectly, as an officer, director, employee, consultant, owner, manager, member, partner, or in any other capacity solicit, perform, or provide, or attempt to perform or provide Conflicting Services in the United States, nor will you assist another person to solicit, perform or provide or attempt to perform or provide Conflicting Services in the United States. You and the Company agree that for purposes of this Agreement, "Conflicting Services" means any product, service, or process or the research and development thereof, of any person or organization other than the Company that is substantially similar to or competitive with a product, service, or process, including the research and development thereof, of the Company. Notwithstanding the above, you will not be deemed to be engaged directly or indirectly in any Conflicting Services if you participate in any such business solely as a passive investor in up to one percent (1%) of the equity securities of a company or partnership, the securities of which are publicly traded.

h. **Termination of Consulting Period.** This Agreement is effective as of the Separation Date above and shall remain in effect until June 30, 2018 provided, however, that (i) Consultant may terminate this Agreement at any time, upon written notice, and (ii) Adverum may terminate this Agreement upon written notice in the event of a material breach of this Agreement by Consultant or in the event that Consultant becomes employed by, provides consulting services or otherwise engages in any business activity (other than passive investment) for competitor companies..

4. **Other Compensation and Benefits.** You acknowledge and agree that you are not entitled to, and will not receive, any severance benefits from the Company in connection with your resignation of employment.

5. **Expense Reimbursements.** You agree that, within ten (10) days after the Separation Date, you will submit your final documented expense reimbursement statement reflecting all business expenses you incurred through the Separation Date, if any, for which you seek reimbursement. The Company will reimburse you for these expenses pursuant to its regular business practice.

6. **Return of Company Property**. By the close of business on the Separation Date, you agree to return to the Company all Company documents (and all copies thereof) and other Company property which you have in your possession or control, including, but not limited to, Company files, notes, drawings, records, plans, forecasts, reports, studies, analyses, proposals, agreements, financial information, research and development information, sales and marketing information, customer lists, prospect information, pipeline reports, sales reports, operational and personnel information, specifications, code, software, databases, computer-recorded information, tangible property and equipment (including, but not limited to, computers, facsimile machines, mobile telephones, servers), credit cards, entry cards, identification badges and keys; and any materials of any kind which contain or embody any proprietary or confidential information of the Company (and all reproductions thereof in whole or in part). You agree that you will make a diligent search to locate any such documents, property and information by the close of business on the Separation Date.

7. **Proprietary Information Obligations**. You acknowledge and reaffirm your continuing obligations under your Proprietary Information and Inventions Agreement.

8. **Nondisparagement.** You agree not to disparage the Company, its officers, directors, employees, shareholders, and agents, in any manner likely to be harmful to its or their business, business reputation, or personal reputation; provided that you will respond accurately and fully to any request for information if required by legal process or in connection with a government investigation. In addition, nothing in this provision or this Agreement is intended to prohibit or restrain you in any manner from making disclosures that are protected under the whistleblower provisions of federal or state law or regulation.

9. **No Admissions.** You understand and agree that the promises and payments in consideration of this Agreement shall not be construed to be an admission of any liability or obligation by the Company to you or to any other person, and that the Company makes no such admission.

10. **Release of Claims**. You hereby generally and completely release the Company and its directors, officers, employees, shareholders, partners, agents, attorneys, predecessors, successors, parent and subsidiary entities, insurers, affiliates, and assigns from any and all claims, liabilities and obligations, both known and unknown, that arise out of or are in any way related to events, acts, conduct, or omissions occurring at any time prior to and including the date you sign this Agreement. This general release includes, but is not limited to: (a) all claims arising out of or in any way related to your employment with the Company or the termination of that employment; (b) all claims related to your compensation or benefits from the Company, including salary, bonuses, commissions, vacation pay, expense reimbursements, severance pay, fringe benefits, stock, stock options, or any other ownership interests in the Company; (c) all claims for breach of contract, wrongful termination, and breach of the implied covenant of good faith and fair dealing; (d) all tort claims, including claims for fraud, defamation, emotional distress, and discharge in violation of public policy; and (e) all federal, state, and local statutory claims, including claims for discrimination, harassment, retaliation, attorneys' fees, or other claims arising under the federal Civil Rights Act of 1964 (as amended), the federal Americans with Disabilities Act of 1990, the California Labor Code (as amended), the California Family Rights Act, the Age Discrimination in Employment Act ("ADEA") and the California Fair Employment and Housing Act (as amended). Notwithstanding the foregoing, you are not releasing the Company hereby from any obligation to indemnify you pursuant to the Articles and Bylaws of the Company, any valid fully executed indemnification agreement with the Company, applicable law, or applicable directors and officers liability insurance. Also, excluded from this Agreement are any claims that cannot be waived by law.

11. **ADEA Release.** You acknowledge that you are knowingly and voluntarily waiving and releasing any rights you have under the ADEA, and that the consideration given for the waiver and releases you have given in this Agreement is in addition to anything of value to which you were already entitled. You further acknowledge that you have been advised, as required by the ADEA, that: (a) your waiver and release does not apply to any rights or claims that arise after the date you sign this Agreement; (b) you should consult with an attorney prior to signing this Agreement (although you may choose voluntarily not to do so); (c) you have twenty-one (21) days to consider this Agreement (although you may choose voluntarily to sign it sooner); (d) you have seven (7) days following the date you sign this Agreement to revoke this Agreement (in a written revocation sent to me); and (e) this Agreement will not be effective until the date upon which the revocation period has expired, which will be the eighth day after you sign this Agreement provided that you do not revoke it (the "Effective Date").

12. **Section 1542 Waiver.** In giving the release herein, which includes claims which may be unknown to you at present, you acknowledge that you have read and understand Section 1542 of the California Civil Code, which reads as follows:

"A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor."

You hereby expressly waive and relinquish all rights and benefits under that section and any law of any other jurisdiction of similar effect with respect to your release of claims herein, including but not limited to your release of unknown claims.

13. **Protected Rights.** You understand that nothing in this Agreement limits your ability to file a charge or complaint with the Equal Employment Opportunity Commission, the Department of Labor, the National Labor Relations Board, the Occupational Safety and Health Administration, the California Department of Fair Employment and Housing, the Securities and Exchange Commission or any other federal, state or local governmental agency or commission ("Government Agencies"). You further understand this Agreement does not limit your ability to communicate with any Government Agencies or otherwise participate in any investigation or proceeding that may be conducted by any Government Agency, including providing documents or other information, without notice to the Company. While this Agreement does not limit your right to receive an award for information provided to the Securities and Exchange Commission, you understand and agree that, to maximum extent permitted by law, you are otherwise waiving any and all rights you may have to individual relief based on any claims that you have released and any rights you have waived by signing this Agreement.

14. **Representations.** You hereby represent that you have been paid all compensation owed and for all hours worked, have received all the leave and leave benefits and protections for which you are eligible pursuant to the Family and Medical Leave Act, the California Family Rights Act, or otherwise, and have not suffered any on-the-job injury for which you have not already filed a workers' compensation claim.

15. **Miscellaneous.** This Agreement, constitutes the complete, final and exclusive embodiment of the entire agreement between you and the Company with regard to its subject matter. It is entered into without reliance on any promise or representation, written or oral, other than those expressly contained herein, and it supersedes any other such promises, warranties or representations. This Agreement may not be modified or amended except in a writing signed by both you and a duly authorized officer of the Company. This Agreement will bind the heirs, personal representatives, successors and assigns of both you and the Company, and inure to the benefit of both you and the Company, their heirs, successors and assigns. If any provision of this Agreement is determined to be invalid or unenforceable, in whole or in part, this determination will not affect any other provision of this Agreement and the provision in question will be modified so as to be rendered enforceable. This Agreement will be deemed to have been entered into and will be construed and enforced in accordance with the laws of the State of California without regard to conflict of laws principles. Any ambiguity in this Agreement shall not be construed against either party as the drafter. Any waiver of a breach of this Agreement shall be in writing and shall not be deemed to be a waiver of any successive breach. This Agreement may be executed in counterparts and facsimile signatures will suffice as original signatures.

If this Agreement is acceptable to you, please sign below and return the original to me. You have twenty-one (21) calendar days to decide whether you would like to accept this Agreement, and the Company's offer contained herein will automatically expire if you do not sign and return it within this timeframe.

We wish you the best in your future endeavors.
Sincerely,

By:/s/Leone Patterson
Leone Patterson
CFO, Interim CEO and President

I HAVE READ, UNDERSTAND AND AGREE FULLY TO THE FOREGOING AGREEMENT:

/s/Athena Countouriotis

Athena Countouriotis

2018-05-08 | 12:03:41 PDT

Date

EXHIBIT A

SUMMARY OF EQUITY GRANTS FOR ATHENA COUNTOURIOTIS

Grant Type	Grant Date	Shares	Price	# of Shares anticipated to vest on or by June 30, 2018
NQ (ISO)	6/19/2017	213,000	$2.90	53,250
RSU	6/19/2017	150,000	--	37,500
ISO	2/15/2018	160,000	$6.40	0

Exhibit 31.1

CERTIFICATION OF THE PRINCIPAL EXECUTIVE OFFICER

PURSUANT TO SECTION 302 OF
THE SARBANES-OXLEY ACT OF 2002

I, Leone Patterson, certify that:

1. I have reviewed this Form 10-Q of Adverum Biotechnologies, 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 8, 2018

By: /s/Leone Patterson
Name: Leone Patterson
Title: *Chief Executive Officer*
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF THE PRINCIPAL FINANCIAL OFFICER

PURSUANT TO SECTION 302 OF

THE SARBANES-OXLEY ACT OF 2002

I, Leone Patterson, certify that:

1. I have reviewed this Form 10-Q of Adverum Biotechnologies, 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 8, 2018

By: /s/Leone Patterson
Name: Leone Patterson
Title: *Chief Financial Officer*
(Principal Financial and Accounting Officer)

Exhibit 32.1

CERTIFICATION
PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report on Form 10-Q of Adverum Biotechnologies, Inc. for the fiscal quarter ended September 30, 2018 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), Leone Patterson, both in her capacity as Interim President and Chief Executive Officer, and as Chief Financial Officer, of Adverum Biotechnologies, Inc., hereby certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to the best of her knowledge, the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, and the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of Adverum Biotechnologies, Inc.

Date: November 8, 2018

By: /s/Leone Patterson
Leone Patterson
Chief Executive Officer, Chief Financial Officer
(Principal Executive and Financial Officer)