As confidentially submitted to the Securities and Exchange Commission on July 21, 2015. This Amendment No. 2 to draft registration statement has not been filed publically with the Securities and Exchange Commission and all information contained herein remains confidential.

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM S-1

REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

Voyager Therapeutics, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**2836**	**46-3003182**
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

75 Sidney Street
Cambridge, Massachusetts 02139
(857) 259-5340
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Steven M. Paul, M.D.
President and Chief Executive Officer
Voyager Therapeutics, Inc.
75 Sidney Street
Cambridge, Massachusetts 02139
(857) 259-5340
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

Mitchell S. Bloom, Esq. **Edwin M. O'Connor, Esq.** **Laurie A. Burlingame, Esq.** **Goodwin Procter LLP** **Exchange Place** **53 State Street** **Boston, Massachusetts 02109** **(617) 570-1000**	**Marc A. Recht, Esq.** **Richard C. Segal, Esq.** **Cooley LLP** **500 Boylston Street** **Boston, Massachusetts 02116** **(617) 937-2300**

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

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

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

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

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

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

Large accelerated filer o	Accelerated filer o	Non-accelerated filer ☒ (Do not check if a smaller reporting company)	Smaller reporting company o

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	**Proposed Maximum Aggregate Offering Price[(1)(2)]**	**Amount of Registration Fee**
Common Stock, $0.001 par value per share	$	$

(1) Includes offering price of shares that the underwriters have the option to purchase to cover over-allotments, if any.

(2) Calculated pursuant to Rule 457(o) of the Securities Act of 1933, as amended, based on an estimate of the proposed maximum aggregate offering price.

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

PROSPECTUS (Subject to completion) **Dated July 21, 2015**

Shares

Common Stock

This is an initial public offering of shares of our common stock. We are offering shares of our common stock. Prior to this offering, there has been no public market for our common stock. We plan to apply to list our common stock on The NASDAQ Global Market under the symbol "VYGR." We expect that the initial public offering price for our common stock will be between $ and $ per share.

We are an "emerging growth company" under applicable Securities and Exchange Commission rules and will be subject to reduced public company reporting requirements for this prospectus and future filings. See the section titled "Prospectus Summary—Implications of Being an Emerging Growth Company."

Our business and investment in our common stock involve significant risks. These risks are described in the section titled "Risk Factors" beginning on page 12 of this prospectus.

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

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

(1) We refer you to the section titled "Underwriting" beginning on page 164 for additional information regarding total underwriting compensation.

The underwriters may also purchase up to an additional shares from us at the initial public offering price, less the underwriting discounts and commissions, within 30 days from the date of this prospectus to cover overallotments.

The underwriters expect to deliver the shares against payment in New York, New York on or about , 2015.

Cowen and Company **Piper Jaffray**

Nomura

Bernstein

, 2015

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You should rely only on the information contained in this prospectus or in any free writing prospectus prepared by us or on our behalf. We have not, and the underwriters have not, authorized any other person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. We are not, and the underwriters are not, making an offer to sell these securities in any jurisdictions where the offer and sale is not permitted. You should assume that the information appearing in this prospectus is accurate only as of the date on the front cover of this prospectus. Our business, financial condition, results of operations and prospects may have changed since such date. Information contained on our website is not a part of this prospectus. Neither we nor any of the underwriters have done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. You are required to inform yourselves about, and to observe any restrictions relating to, this offering and the distribution of this prospectus outside of the United States.

PROSPECTUS SUMMARY

This summary highlights information contained elsewhere in this prospectus and does not contain all of the information that you should consider in making your investment decision. Before investing in our common stock, you should carefully consider, among other things, our financial statements and the related notes and the sections titled "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" included elsewhere in this prospectus. Unless otherwise stated, all references to "us," "our," "Voyager," "Voyager Therapeutics," "we," the "Company" and similar designations refer to Voyager Therapeutics, Inc.

Overview

We are a clinical-stage gene therapy company focused on developing life-changing treatments for patients suffering from severe diseases of the central nervous system, or CNS. We focus on CNS diseases where we believe that an adeno-associated virus, or AAV, gene therapy approach that either increases or decreases the production of a specific protein can slow or reduce the symptoms experienced by patients, and therefore have a clinically meaningful impact. We have created a product engine that enables us to engineer, optimize, manufacture and deliver our AAV-based gene therapies that have the potential to provide durable efficacy following a single administration directly to the CNS. Our product engine has rapidly generated programs for five CNS indications, including advanced Parkinson's disease; a monogenic form of amyotrophic lateral sclerosis, or a form of the disease caused by a single gene mutation; Friedreich's ataxia; Huntington's disease; and spinal muscular atrophy. Our most advanced clinical candidate, VY-AADC01, is being evaluated for the treatment of advanced Parkinson's disease in an open-label, Phase 1b clinical trial with the goal of generating human proof-of-concept data in the second half of 2016. Our founders and members of our management team have extensive experience in drug discovery and development and have pioneered significant advances within the fields of AAV gene therapy and neuroscience.

AAV Gene Therapy for Severe CNS Diseases

Gene therapy is an approach whereby gene expression is directly altered in patients to address the underlying cause or predominant manifestations of disease. CNS diseases are a leading driver of global disease burden and represent the single largest biopharmaceutical market with estimated worldwide annual sales of over $125 billion in 2013, with the five severe CNS indications that we are currently targeting representing only a portion of this market. Due to the limited treatment options available for many CNS diseases, there remains significant unmet medical need and an opportunity for AAV gene therapy to transform the lives of many patients with CNS diseases. We believe that the targeted nature of gene therapy will enable powerful treatment options and provide patients with meaningful and durable benefits.

Our gene therapy approach uses AAV vectors, which are modified, non-replicating versions of AAV, and which we believe are ideal vectors for CNS gene therapy. AAV is able to transfer a therapeutic gene, or transgene, into target cells in the CNS and is believed to be safe, as no AAV vector-related serious adverse events, or SAEs, have been reported in the more than 1,300 patients that we estimate have been treated with AAV gene therapy to date, including 200 patients treated for CNS indications. AAV vectors do not readily integrate into the genome of the target cell, thereby reducing the potential for oncogenesis, or the induction of cancer. While AAV gene therapy can potentially be harnessed for multiple treatment methods, we are currently focused on gene replacement and gene knockdown approaches. Gene replacement is intended to restore the expression of a protein that is either not expressed, expressed at abnormally low levels or functionally mutated with loss of function. Gene knockdown is intended to reduce the expression of a pathologically mutated protein that has detrimental effects.

There are several reasons why we believe that CNS diseases are well-suited for AAV gene therapy. Many CNS diseases are caused by well-defined mutations in genes and these genes represent genetically validated drug targets for AAV gene therapy. Advances in delivery techniques allow for local delivery of AAV vectors to discrete regions of the brain or broader delivery to cells within and surrounding the spinal cord via the cerebrospinal fluid, or CSF. Long-term gene expression may be achievable as cells in the CNS no longer divide, eliminating the potential for cell division to dilute expression of the therapeutic gene.

The Voyager Product Engine

We have built a product engine that we believe positions us to be the leading company at the intersection of AAV gene therapy and severe CNS diseases. Our team of experts in the fields of AAV gene therapy and neuroscience first identifies and selects severe CNS diseases that are well-suited for treatment using AAV gene therapy. We then assess potential programs based upon unmet medical need, evidence that a specific gene is critical to the disease state, the ability to achieve sufficien target gene expression through delivery using an AAV vector, the availability of clinical endpoints with clear and timely readouts and the ability to manufacture the AAV vector at scale.

We apply our expertise in AAV vector engineering and optimization to develop AAV vectors that are best suited for a particular disease. Members of our team have co-discovered many of the known naturally occurring AAV capsids, which are the outer viral protein shells that enclose the target DNA, and have also created promising genetically engineered AAV capsids. Genetically engineered capsids have yielded vectors with desirable properties such as higher potency and enhanced tissue specificity. We continue to optimize and generate AAV capsids using multiple scientific approaches. We believe that the information generated by this work wil enhance our ability to rationally design AAV capsids with specific properties for particular therapeutic applications.

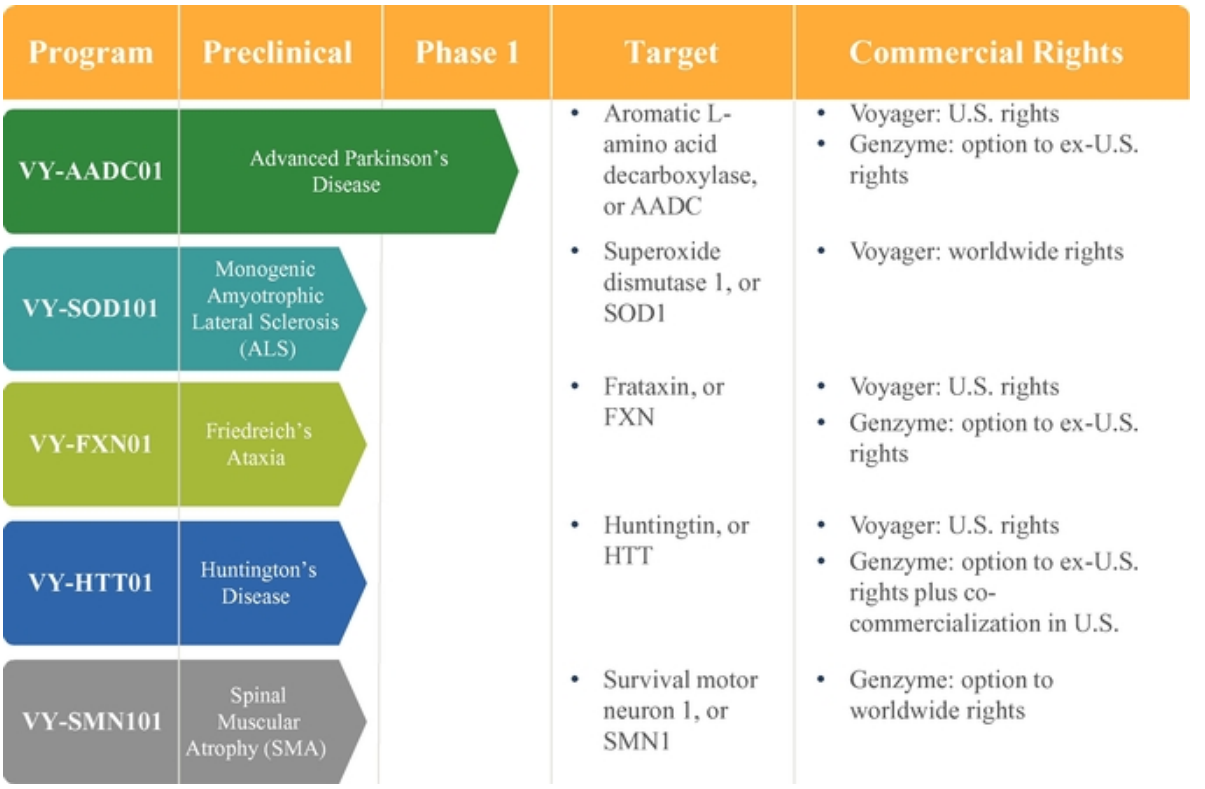
The ability to produce high quality AAV vectors at scale is a critical success factor in AAV gene therapy. While previously at the National Institutes of Health, or NIH, several members of our current production team invented and developed a baculovirus AAV production system, a system for manufacturing AAV vectors that uses viruses from the baculoviridae family, which we use and have continued to improve upon. This system has a number of attributes that enable high quality commercial-scale manufacturing, such as high yields, high purity and scalability. We are building a state-of-the-art process research and development production facility for manufacturing research-grade AAV vectors onsite at our headquarters in Cambridge, Massachusetts and a current good manufacturing practice, or cGMP, commercial-scale AAV manufacturing capability through our collaboration with MassBiologics.

Identifying the optimal route of administration and delivery parameters for AAV gene therapy, such as infusion volume, flow rate and formulation for a specific disease, are critical to achieving safe and effective levels of transgene expression in the targeted location in the CNS. We aim to develop clinically feasible protocols that yield reproducible results across patients. Recent advances in delivery techniques, coupled with real-time, intra-operative magnetic resonance imaging, or MRI, allow for targeted delivery of AAV vectors to discrete regions of the CNS. For our current pipeline programs, we are pursuing a surgical approach for direct injection into a targeted region of the brain or injection into the CSF for broader delivery to the cells within and surrounding the spinal cord.

Our Pipeline of AAV Gene Therapies

We have leveraged our product engine to assemble a pipeline of novel AAV gene therapies for the treatment of severe CNS diseases with high unmet medical need. Several of our product candidates may be eligible for orphan drug designation or breakthrough therapy designation. In February 2015, we entered into a strategi collaboration with Genzyme Corporation, a Sanofi company, or Genzyme, to

leverage our combined expertise and assets to develop AAV gene therapeutics for severe CNS diseases. Under the agreement, we received $65.0 million in upfront cash, a $30.0 million upfront equity investment and an in-kind commitment of $5.0 million, totalling $100 million. Additionally, we are eligible to receive up to $745 million in option and milestone payments while retaining U.S. commercial rights to most programs. Our pipeline of AAV gene therapy programs is summarized in the table below:



Advanced Parkinson's Disease Program: VY-AADC01

Our most advanced clinical candidate, VY-AADC01, is being evaluated for the treatment of advanced Parkinson's disease. It is estimated that up to 15% of the prevalent population with Parkinson's disease, or approximately 100,000 patients in the United States, have motor fluctuations that are refractory, or not well-controlled, with levodopa, or L-Dopa, the current mainstay of therapy, and thus may be candidates for our AAV gene therapy program.

In the first several years after patients' diagnoses, sometimes referred to as the honeymoon period, patients' motor symptoms are generally well-controlled with L Dopa treatment. However, as the disease progresses, patients become less responsive to L-Dopa and experience longer periods of reduced mobility, increased disabili and a dramatically reduced quality of life. Our goal is to restore patients' responsiveness to L-Dopa following treatment with VY-AADC01 to "turn back the clock" or their disease such that the patients' motor symptoms are returned to a well-controlled state, consistent with the level of symptomatic benefit achieved from L-Dopa during the honeymoon period.

An enzyme called aromatic L-amino acid decarboxylase, or AADC, is responsible for the conversion of L-Dopa into the neurotransmitter dopamine. While the underlying cause of Parkinson's disease is unknown, the depletion of AADC and subsequently dopamine leads to the debilitating motor

symptoms associated with the disease. VY-AADC01 is designed to deliver AADC directly to a targeted region of the brain in order to enable the enhanced conversion of L-Dopa into dopamine.

In a completed open-label Phase 1 clinical trial conducted at the University of California, San Francisco, or UCSF, VY-AADC01 was well-tolerated, no treatment-related SAEs were reported and pharmacologic activity was observed. VY-AADC01 is currently being evaluated in an open-label, Phase 1b clinical trial conducted by our collaborators at UCSF. The main goals of this dose-escalation trial are to optimize vector delivery and dose, as well as to obtain further information on the safety profile of the treatment. The dosing of the first cohort of five patients has been completed and no SAEs have been observed to date. The first patient in the second cohort was treated in June 2015.

Preclinical Programs

We are also developing four preclinical AAV gene therapy programs targeting CNS indications where loss or abnormal expression of a specific gene has been identified as the cause of the disease. Based on preclinical data for each of these programs, we believe that we can successfully deliver the target gene to the appropriate tissue and cells in the CNS in order to increase or decrease expression of the target protein, depending upon the disease state. Our goal is to submit our next Investigational New Drug Application, or IND, in 2017.

- **Monogenic ALS Program: VY-SOD101.** Amyotrophic lateral sclerosis, or ALS, is a fatal neurodegenerative disease that leads to muscle weakness and loss of mobility, as well as impaired speech, swallowing and breathing. There are approximately 30,000 patients in the United States with ALS, of which an estimated 600 patients have familial, or inherited, ALS caused by mutations in the superoxide dismutase 1, or SOD1, gene. Since SOD1 mutations that cause ALS result in the overexpression of toxic versions of the protein, we are employing an AAV gene therapy approach that targets th knockdown of SOD1. We expect that the first clinical trial of VY-SOD101 will enroll ALS patients with relevant mutations in the SOD1 gene, bypassing the more traditional approach of enrolling healthy volunteers.

- **Friedreich's Ataxia Program: VY-FXN01.** Friedreich's ataxia is a debilitating neurodegenerative disease resulting in poor coordination of legs and arms, progressive loss of the ability to walk, and a variety of other debilitating symptoms. There are approximately 6,400 patients living with the disease in the United States and there are currently no FDA-approved treatments for the disease. Friedreich's ataxia patients have mutations in the FXN gene, which reduces the production of the frataxin protein. We believe that an AAV gene therapy approach that delivers a functional version of the FX gene could result in meaningfully improved clinical outcomes. We expect that the first clinical trial of VY-FXN01 will enroll Friedreich's ataxia patients.

- **Huntington's Disease Program: VY-HTT01.** Huntington's disease is a fatal, inherited neurodegenerative disorder that results in the progressive decline of motor and cognitive functions. It is estimated that Huntington's disease affects approximately 30,000 patients in the United States. Huntington's disease is caused by mutations in the huntingtin, or HTT, gene. The goal of VY-HTT01 is to knock down expression of HTT to reduce th level of mutated HTT protein in targeted regions of the brain to slow the progression of the cognitive and motor symptoms associated with the disease We expect that the first clinical trial of VY-HTT01 will enroll Huntington's disease patients.

- **SMA Program: VY-SMN101.** Spinal muscular atrophy, or SMA, is an inherited neuromuscular disease that results in progressive muscle weakness and paralysis. It is estimated that SMA affects approximately 10,000 patients in the United States with no currently approved treatments. The severe forms of SMA occur in infants and are fatal. SMA is caused primarily by mutations in the survival motor neuron 1, or SMN1, gene. The goal of VY-SMN101 is to deliver a functional version of the SMN1 gene to restore normal levels of protein expression and provide

meaningfully improved clinical outcomes. We expect that the first clinical trial of VY-SMN101 will enroll SMA patients.

Manufacturing at Commercial Quality and Scale

We are building a state-of-the-art process research and development laboratory and production facility for manufacturing research-grade AAV vector onsite at ou Cambridge, Massachusetts headquarters and a cGMP commercial-scale AAV manufacturing capability through our collaboration with MassBiologics, in Fall River, Massachusetts. For both, we are focused on our baculovirus AAV production system, which has the following attributes:

- **High Yield.** A single manufacturing run at 500-liter scale can yield many thousands of doses of an AAV gene therapy.
- **High Purity.** A relatively high percentage of AAV vectors contain the therapeutic DNA, reducing the number of empty vectors compared to alternativ manufacturing approaches. In addition, the baculovirus system eliminates the risk of introducing mammalian cell derived impurities.
- **Scalability.** This process is reproducible at volumes ranging from 0.02 liters to 500 liters.
- **Promising Regulatory Framework.** AAV gene therapy products manufactured with the baculovirus system include Glybera, the only approved AAV gene therapy product in the Western world, and the marketed vaccines, Flublok and Cervarix.

The Voyager Team

Our founders and members of our management team have extensive experience in drug discovery and development, and have pioneered significant advances in the fields of AAV gene therapy and neuroscience. Members of our team have co-discovered many of the known naturally occurring AAV capsids and have also create promising genetically engineered AAV capsids. Additionally, the baculovirus AAV production system was invented and developed by several members of our current production team while at the NIH.

In order to maximize the value of our product engine and our pipeline, we have raised substantial capital from leading life sciences investors. Our founding investor is Third Rock Ventures, LLC. Additional investors include Genzyme, and six blue chip investment funds including Brookside Capital, Partner Fund Management and Casdin Capital, LLC. As of March 31, 2015, we had approximately $116 million of cash and cash equivalents.

Our Mission and Strategy

Our mission is to become the world leader in AAV gene therapy for treating severe CNS diseases by developing transformative therapies. Our strategy to achieve this mission is to:

- Continually invest in our AAV product engine by focusing on (i) vector engineering and optimization; (ii) manufacturing; and (iii) dosing and delivery techniques.
- Establish a leadership position in commercial-scale, high quality AAV manufacturing, which we believe is critical to any successful AAV gene therapy program.
- Optimize and advance our lead program, VY-AADC01, for the treatment of advanced Parkinson's disease.
- Continue to build a pipeline of gene therapy programs focused on severe CNS diseases, with the goal of adding at least one new pipeline program in early 2016 and submitting our next IND in 2017.

- Maintain and maximize the value of our product commercialization rights, including by building our own sales and marketing infrastructure or partnering with third parties.

- Continue to develop and expand our intellectual property portfolio in order to maintain our leadership position in AAV gene therapy.

Risk Factors

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

- We have incurred net losses since inception and anticipate that we will continue to incur losses for the foreseeable future and may never achieve or maintain profitability.

- Our AAV gene therapy product candidates are based on a relatively novel technology, which makes it difficult to predict the time and cost of development and of subsequently obtaining regulatory approval, if at all. No gene therapy product has been approved in the United States and only on such product has been approved in the European Union.

- The dosing and delivery techniques being employed in the ongoing VY-AADC01 Phase 1b clinical trial are different than those used in prior trials, an dosing and delivery must be further optimized in this trial or we may not generate the human proof-of-concept data we seek.

- We may encounter substantial delays in commencement, enrollment or completion of our clinical trials or we may fail to demonstrate safety and efficacy to the satisfaction of applicable regulatory authorities, which could prevent us from commercializing our current and future product candidate on a timely basis, if at all.

- Our product candidates and the process for administering our product candidates may cause undesirable side effects or have other properties that could delay or prevent their regulatory approval, limit their commercial potential or result in significant negative consequences following any potential marketing approval. In past clinical trials that were conducted by others with non-AAV vectors, several significant side effects were caused by gene therapy treatments, including reported cases of leukemia and death.

- We face significant competition in an environment of rapid technological change and the possibility that our competitors may achieve regulatory approval before us or develop therapies that are more advanced or effective than ours, which may harm our business and financial condition, and our ability to successfully market or commercialize our product candidates.

- To date, all of our revenue has been derived from our collaboration with Genzyme, and if this collaboration agreement were to be terminated, our business financial condition, results of operations and prospects would be harmed.

- Gene therapies are novel, complex and difficult to manufacture. We could experience manufacturing problems that result in delays in our development or commercialization of our product candidates or otherwise harm our business.

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

- If we are unable to obtain and maintain patent protection for our products and technology, or if the scope of the patent protection obtained is not sufficiently broad, our competitors could

develop and commercialize products and technology similar or identical to ours, and our ability to successfully commercialize our products and technology may be adversely affected.

Corporate History and Information

Voyager Therapeutics was incorporated in June 2013 based on the work of over 20 years by our founding scientists. Our executive offices are located at 75 Sidney Street, Cambridge, Massachusetts 02139, and our telephone number is (857) 259-5340. Our website address is www.voyagertherapeutics.com. The informatio contained on, or accessible through, our website does not constitute part of this prospectus. We have included our website address in this prospectus solely as an inactive textual reference.

Implications of Being an Emerging Growth Company

As a company with less than $1.0 billion in revenue during our last fiscal year, we qualify as an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, and we may remain an emerging growth company for up to five years. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from certain disclosure and other requirements that are applicable to other public companies that are not emerging growth companies. In particular, in this prospectus, we have provided only two years of audited financial statements and have not included all of the executive compensation related information that would be required if we were not an emerging growth company. Accordingly, the information contained herein may be different than the information you receive from other public companies in which you hold stock. We may take advantage of the exemptions provided by the JOBS Act for up to five years or such earlier time that we are no longer an emerging growth company. The JOBS Act also provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. We have irrevocably elected not to avail ourselves of this exemption and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies. We would cease to be an emerging growth company if we have more than $1.0 billion in annual revenue, we have more than $700 million in market value of our stock held by non-affiliates or we issue more than $1.0 billion of non-convertible debt over a three year period.

The Voyager name and logo are our trademarks. This prospectus also includes trademarks, trade names and service marks of other persons. All other trademarks, trade names and service marks appearing in this prospectus are the property of their respective owners.

THE OFFERING

Common stock offered by us	shares
Common stock to be outstanding immediately after this offering	shares, or shares if the underwriters exercise their option to purchase additional shares in full.
Underwriters' option to purchase additional shares	shares
Use of proceeds	We estimate that the net proceeds from the sale of shares of common stock will be approximately $ million, or $ if the underwriters exercise their option to purchase additional shares, based upon an assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. We currently intend to use the net proceeds from this offering to fund our VY-AADC01 program for advanced Parkinson's disease, to fund our preclinical programs, including VY-SOD101 for a monogenic form of ALS, VY-FXN01 for Friedreich's ataxia, VY-HTT01 for Huntington's disease and VY-SMN101 for SMA, and for working capital and other general corporate purposes. See the section titled "Use of Proceeds" for additional information.
Risk factors	See the section titled "Risk Factors" for a discussion of factors that you should consider before deciding t invest in our common stock.
Proposed NASDAQ Global Market symbol	"VYGR"

The number of shares of common stock to be outstanding after this offering is based on 69,423,112 shares of common stock outstanding as of March 31, 2015 (including 9,883,416 shares of unvested restricted stock subject to repurchase by us), and excludes the following:

- 1,236,888 shares of common stock reserved for future issuance under our 2014 Stock Option and Grant Plan, as amended; and
- shares of common stock reserved for future issuance under our 2015 Stock Option and Incentive Plan, or 2015 Stock Option Plan, which will become effective immediately prior to the completion of this offering.

Unless otherwise indicated, the number of shares of common stock described in this prospectus gives effect to:

- the filing and effectiveness of our amended and restated certificate of incorporation and the adoption of our amended and restated bylaws, which will occur immediately prior to the completion of this offering;
- the conversion of all outstanding convertible preferred stock into 55,000,000 shares of common stock immediately prior to the completion of this offering;

- no issuance or exercise of stock options on or after March 31, 2015;
- no exercise by the underwriters of their option to purchase up to an additional shares of common stock in this offering to cover overallotments, any; and
- a -for- reverse stock split of our capital stock effected on , 2015.

SUMMARY FINANCIAL DATA

We have derived the summary statements of operations data for the period and year ended December 31, 2013 and 2014, respectively, from our audited financia statements included elsewhere in this prospectus. We have derived the statement of operations data for the three months ended March 31, 2014 and 2015 and the balance sheet data as of March 31, 2015 from our unaudited financial statements included elsewhere in this prospectus. The unaudited financial data have been prepared on the same basis as the audited financial statements and, in management's opinion, include all adjustments, consisting only of normal recurring adjustments, necessary for a fair presentation of the financial information as of and for the periods presented.

You should read the following summary financial data together with our financial statements and the related notes appearing elsewhere in this prospectus and th information set forth in the sections titled "Selected Financial Data" and "Management's Discussion and Analysis of Financial Condition and Results of Operations." Our historical results are not necessarily indicative of results that should be expected in the future, and results for the three months ended March 31, 2015 are not necessarily indicative of the results to be expected for the full year ending December 31, 2015.

	Period from June 19, 2013 (inception) to December 31, 2013	Year Ended December 31, 2014	Three Months Ended March 31,	
			2014	2015
			(unaudited)	
	(in thousands, except share and per share data)			
Statements of Operations Data:				
Collaboration revenue	$ —	$ —	$ —	$ 2,576
Operating expenses:				
Research and development	2,316	8,898	1,432	5,523
General and administrative	1,450	5,469	1,553	1,881
Total operating expenses	3,766	14,367	2,985	7,404
Operating loss	(3,766)	(14,367)	(2,985)	(4,828)
Other expense, net	(67)	(1,950)	(67)	(9,749)
Net loss	$ (3,833)	$ (16,317)	$ (3,052)	$ (14,577)
Net loss per share, basic and diluted[(1)]	$ (383.30)	$ (6.55)	$ (1.63)	$ (3.72)
Weighted-average common shares outstanding, basic and diluted[(1)]	10,000	2,700,696	1,968,333	4,255,824
Pro forma net loss per share, basic and diluted (unaudited)[(1)]		$ (0.88)		$ (0.10)
Pro forma weighted-average common shares outstanding, basic and diluted (unaudited)[(1)]		16,297,956		46,700,268

	As of March 31, 2015		
	Actual	Pro forma[3]	Pro forma as adjusted[4][5]
		(unaudited) (in thousands)	
Balance Sheet Data:			
Cash and cash equivalents	$ 116,414	$ 116,414	
Working capital[2]	94,812	94,812	
Total assets	120,332	120,332	
Long term deferred revenue	48,842	48,842	
Redeemable convertible preferred stock	83,974	—	
Total stockholders' (deficit) equity	(36,097)	47,877	

(1) See Statements of Operations and Note 2 to our financial statements for further details on the calculation of basic and diluted net loss per shar attributable to common stockholders.

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

(3) Pro forma balance sheet data give effect to the automatic conversion of all outstanding shares of convertible preferred stock into an aggregate of 55,000,000 shares of our common stock upon the completion of this offering.

(4) Pro forma as adjusted balance sheet data gives effect to the pro forma adjustments described in (3) above and the sale of shares of our commo stock offered in this offering, assuming an initial public offering price of $ per share, which is the midpoint of the estimated price rang set forth on the cover page of this prospectus, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

(5) Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, working capital, total assets and total stockholders' equity by approximately $ million, assuming that the number of share offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting the estimated underwriting discounts an commissions and estimated offering expenses payable by us. Similarly, each 1,000,000 share increase (decrease) in the number of shares offered by us would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, working capital, total assets and total stockholders' equity by approximately $ million, assuming the assumed initial offering price remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. A 1,000,000 share increase in the number of shares offered by us together with a concomitant $1.00 increase in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase the pro forma as adjusted amount of each of cash and cash equivalents, and total stockholders' equity by approximately $ million, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Conversely, a 1,000,000 share decrease in the number of shares offered by us together with a concomitant $1.00 decrease in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase the pro forma as adjusted amount of each of cash and cash equivalents, and total stockholders' equity by approximately $ million, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

RISK FACTORS

Investing in our common stock involves a high degree of risk. You should carefully consider the risks and uncertainties described below, together with all of the other information in this prospectus, including our financial statements and the related notes appearing at the end of this prospectus, before making a decision to invest in our common stock. The occurrence of any of the events or developments described in this section could harm our business, financial condition, results of operations and prospects. In that event, the trading price of our common stock could decline, and you may lose part or all of your investment.

Risks Related to Our Financial Position and Need for Capital

We have incurred net losses since inception and anticipate that we will continue to incur losses for the foreseeable future and may never achieve or maintain profitability.

We are a clinical-stage biotechnology company with a limited operating history, and have not yet generated revenues from the sales of our product candidates. Investment in biotechnology companies is highly speculative because it entails substantial upfront capital expenditures and significant risk that the product candidate will fail to obtain regulatory approval or become commercially viable. We have not yet demonstrated the ability to complete any clinical trials of our product candidates, obtain marketing approvals, manufacture a commercial-scale product or conduct sales and marketing activities necessary for successful commercialization. We continue to incur significant expenses related to research and development, and other operations in order to commercialize our product candidates. As a result, we are not and have never been profitable and have incurred losses since our inception. Our net loss was $14.6 million and $16.3 million for the three months ended March 31, 2015 and year ended December 31, 2014, respectively. As of March 31, 2015, we had an accumulated deficit of $36.1 million.

We historically have financed our operations primarily through private placements of our convertible preferred stock and our recent collaboration agreement with Genzyme. To date, we have devoted substantially all of our financial resources to building our product engine, selecting product programs, conducting research and development, including preclinical development of our product candidates, building our intellectual property portfolio, building our team and establishing our collaboration with Genzyme. We expect that it could be several years, if ever, before we have a commercialized product candidate. We expect to continue to incur significant expenses and increasing operating losses for the foreseeable future. The net losses we incur may fluctuate significantly from quarter to quarter. We anticipate that our expenses will increase substantially if, and as, we:

- continue investing in our product engine to optimize vector engineering, manufacturing and dosing and delivery techniques;
- continue development of our clinical candidate, VY-AADC01;
- initiate additional preclinical studies and clinical trials for our other programs;
- continue our process research and development activities, as well as establish our research-grade and commercial manufacturing capabilities;
- identify additional CNS diseases for treatment with our AAV gene therapies;
- seek marketing approvals for VY-AADC01 or other product candidates that arise from our programs that successfully complete clinical trials;
- develop a sales, marketing and distribution infrastructure to commercialize any product candidates for which we may obtain marketing approval;
- maintain, expand and protect our intellectual property portfolio; and
- identify, acquire or in-license other product candidates and technologies.

To become and remain profitable, we must develop and eventually commercialize product candidates with significant market potential, which will require us to be successful in a range of challenging activities. These activities can include completing preclinical studies and clinical trials of our product candidates, obtaining marketing approval for these product candidates, manufacturing, marketing and selling those products that are approved and satisfying any post-marketing requirements. We may never succeed in any or all of these activities and, even if we do, we may never generate revenues that are significant or large enough to achieve profitability. If we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable would decrease the value of our company and could impair our ability to raise capital, maintain our research and development efforts, expand our business or continue our operations. A decline in the value of our company also could cause you to lose all or part of your investment.

We may not be able to generate sufficient revenue from the commercialization of our product candidates and may never be profitable.

Our ability to generate revenue and achieve profitability depends on our ability, alone or with our collaborative partners, to successfully complete the development of, and obtain the regulatory approvals necessary to commercialize, our current and future product candidates. Our lead product candidate VY-AADC01 is being evaluated in a Phase 1b clinical trial, and we do not anticipate generating revenues from product sales for the next several years, and we may never succeed in doing so. Our ability to generate future revenues from product sales depends heavily on our and our collaborators' success in:

- completing preclinical and clinical development of our product candidates and identifying new product candidates;
- seeking and obtaining regulatory and marketing approvals for product candidates for which we complete clinical trials;
- launching and commercializing product candidates for which we obtain regulatory and marketing approval by establishing a sales force, marketing and distribution infrastructure or, alternatively, collaborating with a commercialization partner;
- qualifying for adequate coverage and reimbursement by government and third-party payors for our product candidates if and when approved;
- maintaining and enhancing a sustainable, scalable, reproducible and transferable manufacturing process for our vectors and product candidates;
- establishing and maintaining supply and manufacturing relationships with third parties that can provide adequate, in both amount and quality, products and services to support clinical development and the market demand for our product candidates, if approved;
- obtaining market acceptance of our product candidates as a viable treatment option;
- addressing any competing technological and market developments;
- implementing additional internal systems and infrastructure, as needed;
- negotiating favorable terms in any collaboration, licensing or other arrangements into which we may enter and performing our obligations in such collaborations;
- maintaining, protecting and expanding our portfolio of intellectual property rights, including patents, trade secrets and know-how;
- avoiding and defending against third-party interference or infringement claims; and

- attracting, hiring and retaining qualified personnel.

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

Even if this offering is successful, we will need to raise additional funding, which may not be available on acceptable terms, or at all. Failure to obtain this necessary capital when needed may force us to delay, limit or terminate certain of our product development efforts or other operations.

We expect our expenses to increase in connection with our ongoing activities, particularly as we continue the research and development of, initiate further clinical trials of and seek marketing approval for, our product candidates. In addition, if we obtain marketing approval for any of our product candidates, we expect to incur significant expenses related to product sales, medical affairs, marketing, manufacturing and distribution. Furthermore, upon the completion of this offering, we expect to incur additional costs associated with operating as a public company. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on acceptable terms, we would be forced to delay, reduce or eliminate certain of our research and development programs.

Our operations have consumed significant amounts of cash since inception. As of March 31, 2015, our cash and cash equivalents were $116.4 million. We estimate that the net proceeds from this offering will be approximately $ million, based on assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, and after deducting underwriting discounts and commissions and estimated offering expenses payable by us. We expect that our existing cash and cash equivalents, will enable us to fund our operating expenses and capital expenditure requirements for at least the next 24 months. See the section titled "Use of Proceeds."

Our future capital requirements will depend on many factors, including:

- the scope, progress, results and costs of developing our product engine, and conducting preclinical studies and clinical trials for our product candidates;
- the costs, timing and outcome of regulatory review of our product candidates;
- the costs of future activities, including product sales, medical affairs, marketing, manufacturing and distribution, for any of our product candidates for which we receive marketing approval;
- revenue, if any, received from commercial sale of our products, should any of our product candidates receive marketing approval;
- the costs of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending intellectual property-related claims;
- our current collaboration agreement with Genzyme remaining in effect and our receipt of option fees and achievement of milestones under this agreement;
- our ability to establish and maintain additional partnerships on favorable terms, if at all; and
- the extent to which we acquire or in-license other product candidates and technologies.

Identifying potential product candidates and conducting preclinical studies and clinical trials is a time-consuming, expensive and uncertain process that takes years to complete, and we may never generate the necessary data or results required to obtain marketing approval and achieve product sales. In addition, our product candidates, if approved, may not achieve commercial success. Our product revenues, if any, and any commercial milestones or royalty payments under our collaboration agreements, will be derived from or based on sales of products that may not be commercially available for many years, if at all. Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. To the extent that additional capital is raised through the sale of equity or equity-linked securities, the issuance of those securities could result in substantial dilution for our current stockholders and the terms may include liquidation or other preferences that adversely affect the rights of our current stockholders. To the extent that additional capital is raised through the issuance of debt, the agreement governing such debt may contain restrictive covenants related to our capital raising and other financial and operational matters, which may make it more difficult for us to obtain additional capital and to pursue business operations, including potential acquisitions. Furthermore, the issuance of additional securities, whether equity or debt, by us, or the possibility of such issuance, may cause the market price of our common stock to decline and our existing stockholders may not agree with the terms of such financings. Adequate additional financing may not be available to us on acceptable terms, or at all.

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

Our AAV gene therapy product candidates are based on a relatively novel technology, which makes it difficult to predict the time and cost of development and of subsequently obtaining regulatory approval, if at all. No gene therapy product has been approved in the United States and only one such product has been approved in the European Union.

We have concentrated our research and development efforts to date on our product engine, identifying our initial targeted disease indications, and our initial product candidates, and our future success depends on our successful development of viable AAV gene therapy product candidates. Currently, only one of our product candidates, VY-AADC01, is in clinical development, and the remainder of our product candidates are in preclinical development. There can be no assurance that we will not experience problems or delays in developing our product candidates and that such problems or delays will not cause unanticipated costs, or that any such development problems can be solved. We also may experience unanticipated problems or delays in expanding our manufacturing capacity.

The clinical trial requirements of the FDA, the EMA and other regulatory authorities and the criteria these regulators use to determine the safety and efficacy of a product candidate vary substantially according to the type, complexity, novelty and intended use and market of the product candidate. The regulatory approval process for novel product candidates such as gene therapies can be more expensive and take longer than for other, better known or more extensively studied product candidates. Only one gene therapy product, uniQure N.V.'s, or uniQure, Glybera, has received marketing authorization from the European Commission and no gene therapy products have received marketing authorization in the United States. It is difficult to determine how long it will take or how much it will cost to obtain regulatory approvals for our product candidates in either the United States or the European Union or how long it will take to commercialize our product candidates. Approvals by the European Commission may not be indicative of what the FDA may require for approval and different or additional pre-clinical studies or clinical trials may be required to support regulatory approval in each respective jurisdiction. Delay or failure to obtain, or unexpected costs in obtaining, the regulatory approval necessary to bring a potential product candidate to market could decrease our ability to generate sufficient product revenue, and our business, financial condition, results of operations and prospects may be harmed.

Regulatory requirements governing gene and cell therapy products have changed frequently and may continue to change in the future.

The FDA has established the Office of Cellular, Tissue and Gene Therapies within its Center for Biologics Evaluation and Research, or CBER, to consolidate the review of gene therapy and related products, and has established the Cellular, Tissue and Gene Therapies Advisory Committee to advise CBER in its review. Gene therapy clinical trials conducted at institutions that receive funding for recombinant DNA research from the NIH are also potentially subject to review by the NIH Office of Biotechnology Activities' Recombinant DNA Advisory Committee, or the RAC. The ongoing Phase 1b clinical trial of VY-AADC01 is being conducted at UCSF and therefore is subject to oversight by these authorities. Even though the FDA decides whether individual gene therapy protocols may proceed, the RAC public review process, if undertaken, can delay the initiation of a clinical trial, even if the FDA has reviewed the trial design and details and permitted its initiation. Conversely, the FDA may place an IND on a clinical hold even if the RAC has provided a favorable review or an exemption from in-depth, public review. In addition, NIH-funded institutions need to have their institutional biosafety committee as well as their institutional review board, or IRB, review proposed clinical trials to assess the safety of the trial. The ongoing Phase 1b clinical trial of VY-AADC01 has been reviewed by the UCSF IRB, and such trial will need to be re-reviewed by the UCSF IRB if the protocol for the trial is further amended. In addition, adverse developments in clinical trials of gene therapy products conducted by us or others may cause the FDA or other oversight bodies to change the requirements for approval of any of our product candidates. Similarly, EMA may issue new guidelines concerning the development and marketing authorization for gene therapy medicinal products and require that we comply with these new guidelines. The EMA and agencies at both the federal and state level in the United States have expressed an interest in further regulating new biotechnologies, including gene therapy.

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 product candidates or lead to significant post-approval limitations or restrictions. As we advance our product candidates, we will be required to consult with these regulatory and advisory groups, and comply with applicable guidelines. If we fail to do so, we may be required to delay or discontinue development of certain of our product candidates. These additional processes may result in a review and approval process that is longer than we otherwise would have expected. Delays as a result of increased or lengthier regulatory approval process and further restrictions on development of our product candidates can be costly and could negatively impact our or our collaborators' ability to complete clinical trials and commercialize our current and future product candidates in a timely manner, if at all.

Positive results from preclinical studies and early-stage clinical trials may not be indicative of efficacy in late-stage clinical trials.

All of our product candidates are in early stages of development. Study designs and results from previous clinical trials are not necessarily predictive of our future clinical trial designs or results, and initial results may not be confirmed upon full analysis of the complete trial or study data. Our product candidates may fail to show the desired safety and efficacy in later stages of clinical development despite having successfully advanced through preclinical studies and initial clinical trials.

A number of companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials even after achieving promising results in early-stage clinical trials. If a larger population of patients does not experience positive results, if these results are not reproducible, or if our products show diminishing activity over time, our products may not receive approval from the EMA or the FDA. Data obtained from preclinical and clinical activities are subject

to varying interpretations, which may delay, limit or prevent regulatory approval. In addition, we may encounter regulatory delays or rejections as a result of many factors, including changes in regulatory policy during the period of product development. Failure to confirm favorable results from earlier trials by demonstrating the safety and effectiveness of our products in late-stage clinical trials with larger patient populations could harm our business and we may never succeed in commercialization or generating product revenue.

The dosing and delivery techniques being employed in the ongoing VY-AADC01 Phase 1b clinical trial are different from those used in prior trials, and dosing and delivery must be further optimized in this trial or we may not generate the human proof-of-concept data we seek.

The clinical trial results of some of our collaborators have been negatively affected by factors that had not been fully anticipated prior to examination of the trial results. For example, the magnitude of the clinical responses seen in the Phase 1 clinical trial of VY-AADC01 conducted by UCSF were similar to placebo effects observed in previous surgical therapies in Parkinson's disease. As a result, we are unable to rely on the results of this Phase 1 trial for an indication of the efficacy of treatment with VY-AADC01. We believe that there is a need to optimize the delivery, dose and volume of infusion of VY-AADC01 to substantially increase the coverage of the putamen, the region of the brain targeted by VY-AADC01, to achieve a clinical benefit. However, we can provide no assurances that we will be able to optimize these parameters and thereby achieve sufficient coverage of the putamen to achieve a clinical benefit.

The ongoing Phase 1b clinical trial of VY-AADC01 incorporates several design features that are different from those used in UCSF's previously completed Phase 1 clinical trial, in an attempt to increase the area of the putamen, particularly the posterior putamen, which receives VY-AADC01 treatment. Larger infusion volumes of VY-AADC01 are being employed along with higher doses of VY-AADC01. In addition, the Clearpoint System, which is manufactured by MRI Interventions, Inc., is being used during the surgical procedure to provide accurate placement of the cannula, or small tube used in the procedure, in the putamen and allow for real-time, intra-operative MRI to assist the physician in visualizing the delivery of VY-AADC01 to the putamen. In the prior Phase 1 clinical trial of VY-AADC01 conducted by UCSF, physicians surgically administered VY-AADC01 without the use of the Clearpoint System, and therefore did not have real-time visualization of treatment delivery.

Due to the nature of the techniques being used in the Phase 1b clinical trial and the numerous variables that can be changed, it is possible that the data generated from this trial may not provide evidence of clinical benefit. For example, physicians may use needles of differing lengths in the infusion procedure, or may use differing infusion speeds or infusion angles. These differences could affect the dose of VY-AADC01 that ultimately reaches the putamen, leading to highly variable results.

We may encounter substantial delays in commencement, enrollment or completion of our clinical trials or we may fail to demonstrate safety and efficacy to the satisfaction of applicable regulatory authorities, which could prevent us from commercializing our current and future product candidates on a timely basis, if at all.

Before obtaining marketing approval from regulatory authorities for the sale of our current and future product candidates, we must conduct extensive clinical trials to demonstrate the safety and efficacy of the product candidates. Clinical trials are expensive, time-consuming and outcomes are uncertain.

We have very limited experience with clinical trials. To date, we have neither commenced nor completed any clinical trials. The ongoing Phase 1b clinical trial of VY-AADC01 is being conducted by UCSF. We cannot guarantee that any clinical trials will be conducted as planned or completed on schedule, if at all. A clinical trial failure can occur at any stage of testing.

Identifying and qualifying patients to participate in clinical trials of our product candidates is critical to our success. We may not be able to identify, recruit and enroll a sufficient number of patients, or those with required or desired characteristics, to complete our clinical trials in a timely manner. Patient enrollment and trial completion is affected by factors including:

- perceived risks and benefits of AAV gene therapy-based approaches for the treatment of CNS diseases;
- size of the patient population and process for identifying patients;
- design of the trial protocol;
- eligibility and exclusion criteria;
- patients with preexisting antibodies to the vector that preclude their participation in the trial;
- perceived risks and benefits of the product candidate under study;
- availability of competing therapies and clinical trials;
- severity of the disease under investigation;
- availability of genetic testing for potential patients;
- proximity and availability of clinical trial sites for prospective patients;
- ability to obtain and maintain patient consent;
- risk that enrolled patients will drop out before completion of the trial;
- our inability to locate appropriately trained physicians to conduct such clinical trials, which may be particularly difficult for the VY-AADC01 clinical trial, in which we are using the ClearPoint System, which is only available at a small number of academic medical centers in the United States;
- patient referral practices of physicians; and
- ability to monitor patients adequately during and after treatment.

Further, we plan to seek marketing approvals in the United States, the European Union and other jurisdictions, which may require that we conduct clinical trials in foreign countries. Our ability to successfully initiate, enroll and complete a clinical trial in any foreign country is subject to numerous risks unique to conducting business in foreign countries, including:

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

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

Other events that may prevent successful or timely completion of clinical development include:

- delays in reaching a consensus with regulatory authorities on trial design;
- delays in reaching agreement on acceptable terms with prospective CROs, and clinical trial sites;
- delays in opening clinical trial sites or obtaining required IRB or independent ethics committee approval at each clinical trial site;
- imposition of a clinical hold by regulatory authorities as a result of a serious adverse event or after an inspection of our clinical trial operations or trial sites;
- failure by us, any CROs we engage or any other third parties to adhere to clinical trial requirements;
- failure to perform in accordance with the FDA's good clinical practices, or GCP, or applicable regulatory guidelines in the European Union;
- failure by physicians to adhere to delivery protocols leading to variable results;
- delays in the testing, validation, manufacturing and delivery of our product candidates to the clinical sites, including delays by third parties with whom we have contracted to perform certain of those functions;
- delays in having patients complete participation in a trial or return for post-treatment follow-up;
- clinical trial sites or patients dropping out of a trial;
- selection of clinical endpoints that require prolonged periods of clinical observation or analysis of the resulting data;
- occurrence of serious adverse events associated with the product candidate that are viewed to outweigh its potential benefits;
- occurrence of serious adverse events in trials of the same class of agents conducted by other sponsors; or
- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols.

Any inability to successfully complete preclinical studies and clinical trials could result in additional costs to us or impair our ability to generate revenues from product sales, regulatory and commercialization milestones and royalties. In addition, 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. Clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our product candidates or allow our competitors to bring products to market before we do, which could impair our ability to successfully commercialize our product candidates and may harm our business, financial condition, results of operations and prospects.

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

- be delayed in obtaining marketing approval for our product candidates, if at all;
- obtain approval for indications or patient populations that are not as broad as intended or desired;
- obtain approval with labeling that includes significant use or distribution restrictions or safety warnings;
- be subject to changes in the way the product is administered;

- be required to perform additional clinical trials to support approval or be subject to additional post-marketing testing requirements;
- have regulatory authorities withdraw, or suspend, their approval of the product or impose restrictions on its distribution in the form of a modified risk evaluation and mitigation strategy;
- be subject to the addition of labeling statements, such as warnings or contraindications;
- be sued; or
- experience damage to our reputation.

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

In past clinical trials that were conducted by others with non-AAV vectors, several significant side effects were caused by gene therapy treatments, including reported cases of leukemia and death. Other potential side effects could include an immunologic reaction and insertional oncogenesis, which is the process whereby the insertion of a functional gene near a gene that is important in cell growth or division results in uncontrolled cell division, which could potentially enhance the risk of malignant transformation. If our vectors demonstrate a similar adverse effect, or other adverse events, we may be required to halt or delay further clinical development of our product candidates.

In addition to side effects caused by the product candidate, the administration process or related procedures also can cause side effects. VY-AADC01 and VY-HTT01 will be administered directly to the targeted cells in the brain, thus requiring the patient to undergo brain surgery. In a previous Phase 1 clinical trial conducted by UCSF, several patients experienced hemorrhages caused by the surgical procedure for administering VY-AADC01. We are using the ClearPoint System, which has only been used in limited neurosurgeries to date, in the ongoing Phase 1b clinical trial of VY-AADC01 to provide real-time MRI guidance. If any side effects were to occur in connection with the surgical procedure, our clinical trials could be suspended or terminated.

If in the future we are unable to demonstrate that such side effects were caused by the administration process or related procedures, the FDA, the European Commission, the EMA or other regulatory authorities could order us to cease further development of, or deny approval of, our product candidates for any or all targeted indications. Even if we are able to demonstrate that any future SAEs are not product-related, and regulatory authorities do not order us to cease further development of our product candidates, such occurrences could affect patient recruitment or the ability of enrolled patients to complete the trial. Moreover, if we elect, or are required, to delay, suspend or terminate any clinical trial of any of our product candidates, the commercial prospects of such product candidates may be harmed and our ability to generate product revenues from any of these product candidates may be delayed or eliminated. Any of these occurrences may harm our ability to develop other product candidates, and may harm our business, financial condition and prospects significantly.

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

- regulatory authorities may suspend or withdraw approvals of such product candidate;
- regulatory authorities may require additional warnings on the label;

- we may be required to change the way a product candidate is administered or conduct additional clinical trials;
- we could be sued and held liable for harm caused to patients; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of our product candidates and could significantly harm our business, prospects, financial condition and results of operations.

We may be unable to obtain orphan drug designation or exclusivity. If our competitors are able to obtain orphan drug exclusivity for products that constitute the same drug and treat the same indications as our product candidates, we may not be able to have competing products approved by the applicable regulatory authority for a significant period of time.

Regulatory authorities in some jurisdictions, including the United States and the European Union, may designate drugs for relatively small patient populations as orphan drugs. Under the Orphan Drug Act of 1983, the FDA may designate a product candidate as an orphan drug or biological product if it is intended to treat a rare disease or condition, which is generally defined as having a patient population of fewer than 200,000 individuals in the United States, or a patient population greater than 200,000 in the United States where there is no reasonable expectation that the cost of developing the drug or biological product will be recovered from sales in the United States. In the European Union, EMA's Committee for Orphan Medicinal Products grants orphan drug designation to promote the development of products that are intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition affecting not more than five in 10,000 persons in the European Union. Additionally, orphan designation is granted for products intended for the diagnosis, prevention or treatment of a life-threatening, seriously debilitating or serious and chronic condition and when, without incentives, it is unlikely that sales of the drug in the European Union would be sufficient to justify the necessary investment in developing the drug or biologic product.

Generally, if a product candidate with an orphan drug designation receives the first marketing approval for the indication for which it has such designation, the product is entitled to a period of marketing exclusivity, which precludes the FDA or the European Commission from approving another marketing application for a product that constitutes the same drug treating the same indication for that marketing exclusivity period, except in limited circumstances. If another sponsor receives such approval before we do (regardless of our orphan drug designation), we will be precluded from receiving marketing approval for our product for the applicable exclusivity period. The applicable period is seven years in the United States and 10 years in the European Union. The exclusivity period in the United States can be extended by six months if the biologics license application, or BLA, sponsor submits pediatric data that fairly respond to a written request from the FDA for such data. The exclusivity period in the European Union can be reduced to six years if a product no longer meets the criteria for orphan drug designation or if the product is sufficiently profitable so that market exclusivity is no longer justified. Orphan drug exclusivity may be revoked if any regulatory agency determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the product to meet the needs of patients with the rare disease or condition.

We believe that all of our current programs may qualify for orphan drug designation. Even if we obtain orphan drug exclusivity for a product candidate, that exclusivity may not effectively protect the product candidate from competition because different drugs or biological products can be approved for the same condition. In the United States, even after an orphan drug is approved, the FDA may subsequently approve another drug or biological product for the same condition if the FDA concludes that the latter drug or biological product is not the same drug or biological product or is clinically superior in that it is shown to be safer, more effective or makes a major contribution to patient care. In

the European Union, marketing authorization may be granted to a similar medicinal product for the same orphan indication if:

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

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

We may seek a breakthrough therapy designation for some of our product candidates. A breakthrough therapy is defined as a drug or biological product that is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the drug or biological product may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. For drugs or biological products that have been designated as breakthrough therapies, interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens. Drugs designated as breakthrough therapies by the FDA are also eligible for accelerated approval.

Designation as a breakthrough therapy is within the discretion of the FDA. Accordingly, even if we believe one of our product candidates meets the criteria for designation as a breakthrough therapy, the FDA may disagree and instead determine not to make such designation. In any event, the receipt of a breakthrough therapy designation for a product candidate may not result in a faster development process, review or approval compared to drugs considered for approval under conventional FDA procedures and does not assure ultimate approval by the FDA. In addition, even if one or more of our product candidates qualify as breakthrough therapies, the FDA may later decide that the drugs or biological products no longer meet the conditions for qualification.

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

We cannot commercialize a product candidate until the appropriate regulatory authorities have reviewed and approved the product candidate. Even if our product candidates meet their safety and efficacy endpoints in clinical trials, the regulatory authorities may not complete their review processes in a timely manner, or we may not be able to obtain regulatory approval. Additional delays may result if an FDA Advisory Committee or other regulatory authority recommends non-approval or restrictions on approval. In addition, we may experience delays or rejections based upon additional government regulation from future legislation or administrative action, or changes in regulatory authority policy during the period of product development, clinical trials and the review process.

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

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

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

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

- issue a warning letter asserting that we are in violation of the law;
- seek an injunction or impose administrative, civil or criminal penalties or monetary fines;
- suspend or withdraw regulatory approval;
- suspend any ongoing clinical trials;
- refuse to approve a pending BLA or comparable foreign marketing application, or any supplements thereto, submitted by us or our strategic partners;
- restrict the marketing or manufacturing of the product;

- seize or detain the product or otherwise require the withdrawal of the product from the market;
- refuse to permit the import or export of products; or
- refuse to allow us to enter into supply contracts, including government contracts.

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

In addition, FDA policies, and those of equivalent foreign regulatory agencies, may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the United States or abroad. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained and we may not achieve or sustain profitability, which would harm our business, financial condition, results of operations and prospects.

We face significant competition in an environment of rapid technological change and the possibility that our competitors may achieve regulatory approval before us or develop therapies that are more advanced or effective than ours, which may harm our business and financial condition, and our ability to successfully market or commercialize our product candidates.

The biotechnology and pharmaceutical industries, including the gene therapy field, are characterized by rapidly changing technologies, significant competition and a strong emphasis on intellectual property. We face substantial competition from many different sources, including large and specialty pharmaceutical and biotechnology companies, academic research institutions, government agencies and public and private research institutions.

We are aware of several companies focused on developing gene therapies in various indications, including bluebird bio, Inc., Applied Genetic Technologies Corporation, Asklepios BioPharmaceutical, Inc., Audentes Therapeutics, Inc., Avalanche Biotechnologies, Inc., Dimension Therapeutics, Inc., GenSight Biologies SA, NightstaRx Ltd, REGENXBIO Inc., uniQure and Spark Therapeutics, Inc. as well as several companies addressing other methods for modifying genes and regulating gene expression. Any advances in gene therapy technology made by a competitor may be used to develop therapies that could compete against any of our product candidates.

The main competitors for our specific programs include:

- VY-AADC01 will compete with a variety of therapies currently marketed and in development for advanced Parkinson's disease, including deep brain simulation marked by Medtronic plc, St. Jude Medical Inc. and other medical device companies, DUOPA/Duodopa marketed by AbbVie Inc., as well as AMT-090 or AAV-GDNF in development at uniQure, OXB-102/Prosavin in development at Oxford Biomedica plc and ND0612H in development at NeuroDerm Ltd.
- VY-SOD101 for a monogenic form of ALS will potentially compete with ISIS 333611 being developed by Isis Pharmaceuticals, Inc., or Isis, in collaboration with Biogen Idec., or Biogen and Tirasemtiv being developed by Cytokinetics, Inc., or Cytokinetics;
- VY-FXN01 for Friedreich's ataxia will potentially compete with RG2833 being developed by BioMarin Pharmaceutical Inc., AAV-FXN being developed by AAVLife, and frataxin targeted gene therapy being developed by Agilis Biotherapeutics, LLC in collaboration with Intrexon Corporation and BB-FA being developed by BioBlast Pharma Ltd., or BioBlast;

- VY-HTT01 for Huntington's disease will potentially compete with ISIS-HTTRx being developed by Isis in collaboration with F. Hoffman-La Roche Ltd., or Roche, gene editing approach being developed by Sangamo Biosciences, Inc. in collaboration with Shire plc, and another gene therapy being developed by uniQure; and

- VY-SMN101 for spinal muscular atrophy will potentially compete with ChariSMA being developed by AveXis Inc., ISIS-SMN_{RX} being developed by Isis and Biogen, LMI-070 being developed by Novartis AC, RO6885247 being developed by PTC Therapeutics, Inc. and Roche, BBrm1 being developed by BioBlast and CK-2127107 being developed by Cytokinetics in collaboration with Astellas Pharma US, Inc.

Many of our potential competitors, alone or with their strategic partners, have substantially greater financial, technical and other resources, such as larger research and development, clinical, marketing and manufacturing organizations. Mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated among a smaller number of competitors. Our commercial opportunity could be reduced or eliminated if competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we may develop. Competitors also may obtain FDA or other regulatory approval for their products more rapidly or earlier than us, which could result in our competitors establishing a strong market position before we are able to enter the market. Additionally, technologies developed by our competitors may render our potential product candidates uneconomical or obsolete, and we may not be successful in marketing our product candidates against competitors.

In addition, as a result of the expiration or successful challenge of our patent rights, we could face more litigation with respect to the validity and scope of patents relating to our competitors' products. The availability of our competitors' products could limit the demand, and the price we are able to charge, for any products that we may develop and commercialize. If we are not able to compete effectively against potential competitors, our business will not grow and our financial condition and operations will be harmed.

Even if we obtain and maintain approval for our product candidates from the FDA, we may never obtain approval for our product candidates outside of the United States, which would limit our market opportunities and adversely affect our business.

Approval of a product candidate in the United States by the FDA does not ensure approval of such product candidate by regulatory authorities in other countries or jurisdictions, and approval by one foreign regulatory authority does not ensure approval by regulatory authorities in other foreign countries or by the FDA. Sales of our product candidates outside of the United States will be subject to foreign regulatory requirements governing clinical trials and marketing approval. Even if the FDA grants marketing approval for a product candidate, comparable regulatory authorities of foreign countries also must approve the manufacturing and marketing of the product candidates in those countries. Approval procedures vary among jurisdictions and can involve requirements and administrative review periods different from, and more onerous than, those in the United States, including additional preclinical studies or clinical trials. In many countries outside the United States, a product candidate must be approved for reimbursement before it can be approved for sale in that country. In some cases, the price that we intend to charge for our products, if approved, is also subject to approval. We intend to submit a marketing authorization application to EMA for approval of our product candidates in the European Union, but obtaining such approval from the European Commission following the opinion of EMA is a lengthy and expensive process. Even if a product candidate is approved, the FDA or the European Commission, as the case may be, may limit the indications for which the product may be marketed, require extensive warnings on the product labeling or require expensive and time-consuming additional clinical trials or reporting as conditions of

approval. Regulatory authorities in countries outside of the United States and the European Union also have requirements for approval of product candidates with which we must comply prior to marketing in those countries. Obtaining foreign regulatory approvals and compliance with foreign regulatory requirements could result in significant delays, difficulties and costs for us and could delay or prevent the introduction of our product candidates in certain countries.

Further, clinical trials conducted in one country may not be accepted by regulatory authorities in other countries. Also, regulatory approval for any of our product candidates may be withdrawn. If we fail to comply with the regulatory requirements, our target market will be reduced and our ability to realize the full market potential of our product candidates will be harmed and our business, financial condition, results of operations and prospects will be harmed.

Risks Related to Third Parties

To date, all of our revenue has been derived from our collaboration with Genzyme, and if this collaboration agreement were to be terminated, our business financial condition, results of operations and prospects would be harmed.

In February 2015, we entered into a collaboration agreement with Genzyme to leverage our combined expertise and assets in gene therapy for CNS diseases. Under the agreement, we received an upfront commitment of approximately $100 million. Pursuant to the agreement, we granted Genzyme an exclusive option to license, develop and commercialize (i) ex-U.S. rights to our advanced Parkinson's disease, Friedreich's ataxia and Huntington's disease programs and a future program, or the Split Territory Programs, with an incremental option to co-commercialize the product candidate from our Huntington's disease program in the United States and (ii) worldwide rights to our SMA program. If Genzyme exercises an option for a Split Territory Program, except for our advanced Parkinson's disease program, it is required to make an option exercise payment to us. Furthermore, Genzyme shall pay up to $645 million in the aggregate upon the achievement of specified regulatory and commercial milestones, and will pay us tiered royalty payments based on a percentage of net sales of product candidates from the programs for which it is exercised its option, or the Optioned Programs.

Following Genzyme's exercise of an option for a program, Genzyme will have sole responsibility for the development and commercialization of the product candidates from such program in the applicable territory. Genzyme will have the sole discretion to determine and direct its efforts and resources, including the ability to discontinue all efforts and resources, it applies to the development and, if approval is obtained, commercialization and marketing of the product candidates covered by the Optioned Programs in the applicable territories. Genzyme may not be effective in obtaining approvals for the product candidates developed from the Optioned Programs or in marketing, or arranging for necessary supply, manufacturing or distribution relationships for, any approved products. Furthermore, Genzyme may change its strategic focus or pursue alternative technologies in a manner that results in reduced, delayed or no revenue to us. Genzyme has a variety of marketed products and product candidates under collaboration with other companies, including some of our competitors, and its own corporate objectives may not be consistent with our best interests. If Genzyme fails to develop, obtain regulatory approval for or ultimately commercialize any product candidate from the Optioned Programs in the applicable territories, or if Genzyme terminates our collaboration, our business, financial condition, results of operations and prospects would be harmed. In addition, any dispute or litigation proceedings we may have with Genzyme in the future could delay development programs, create uncertainty as to ownership of or access to intellectual property rights, distract management from other business activities and generate substantial expense.

We expect to rely on the ClearPoint System for the foreseeable future for the delivery of our product candidates that are injected directly into targeted regions of the brain. If there are any issues with the ClearPoint System or the manufacturer of the ClearPoint System, our business could be adversely affected.

The ClearPoint System is being used in the ongoing Phase 1b clinical trial of VY-AADC01 as a treatment for advanced Parkinson's disease, and we expect to continue to use the ClearPoint System in future clinical trials of VY-AADC01 and any other of our product candidates that are injected directly into the brain. Therefore, any issues with the ClearPoint System, such as a finding that use of the ClearPoint System causes adverse events or a product recall, or the manufacturer of the ClearPoint System, such as bankruptcy or a decision to stop production of the system due to lack of profitability, could delay the development or commercialization of certain of our product candidates, which would have an adverse effect on our business and results of operations.

We may enter into collaborations in the future with other third parties. If these collaborations are not successful, our business could be adversely affected.

We may enter into additional collaborations in the future. Our ability to generate revenues from our collaborations will depend on our and our collaborators' abilities to successfully perform the functions assigned to each of us in these arrangements. In addition, our collaborators have the ability to abandon research or development projects and terminate applicable agreements. Moreover, an unsuccessful outcome in any clinical trial for which our collaborator is responsible could be harmful to the public perception and prospects of our gene therapy platform.

Our relationship with any future collaborations may pose several risks, including the following:

- collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborators may not perform their obligations as expected;
- the clinical trials conducted as part of these collaborations may not be successful;
- collaborators may not pursue development and commercialization of any product candidates that achieve regulatory approval or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in the collaborators' strategic focus or available funding or external factors, such as an acquisition, that divert resources or create competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for clinical trials, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical trials;
- we may not have access to, or may be restricted from disclosing, certain information regarding product candidates being developed or commercialized under a collaboration and, consequently, may have limited ability to inform our stockholders about the status of such product candidates;
- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours;
- product candidates developed in collaboration with us may be viewed by our collaborators as competitive with their own product candidates or products, which may cause collaborators to cease to devote resources to the commercialization of our product candidates;

- a collaborator with marketing and distribution rights to one or more of our product candidates that achieve regulatory approval may not commit sufficient resources to the marketing and distribution of any such product candidate;

- disagreements with collaborators, including disagreements over proprietary rights, contract interpretation or the preferred course of development of any product candidates, may cause delays or termination of the research, development or commercialization of such product candidates, may lead to additional responsibilities for us with respect to such product candidates or may result in litigation or arbitration, any of which would be time-consuming and expensive;

- collaborators may not properly maintain or defend our intellectual property rights or may use our proprietary information in such a way as to invite litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential litigation;

- disputes may arise with respect to the ownership or inventorship of intellectual property developed pursuant to our collaborations;

- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability;

- the terms of our collaboration agreement may restrict us from entering into certain relationships with other third parties, thereby limiting our options; and

- collaborations may be terminated for the convenience of the collaborator and, if terminated, we could be required to raise additional capital to pursue further development or commercialization of the applicable product candidates.

If our collaborations do not result in the successful development and commercialization of products, or if one of our collaborators terminates its agreement with us, we may not receive any future research funding or milestone or royalty payments under the collaboration. If we do not receive the funding we expect under these agreements, our development of product candidates could be delayed and we may need additional resources to develop our product candidates. In addition, if one of our collaborators terminates its agreement with us, we may find it more difficult to attract new collaborators and the perception of us in the business and financial communities could be adversely affected. All of the risks relating to product development, regulatory approval and commercialization described in this prospectus apply to the activities of our collaborators.

If we decide to enter into future collaborations, we could face significant competition in seeking appropriate collaborators and the negotiation process is time-consuming and complex. Our ability to reach a definitive collaboration agreement with any future collaborators will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of several factors. If we license rights to product candidates, we may not be able to realize the benefit of such transactions if we are unable to successfully integrate them with our existing operations and company culture.

We expect to rely on third parties to conduct, supervise and monitor our clinical trials, and if these third parties perform in an unsatisfactory manner, our business could be harmed.

We expect to rely on CROs and clinical trial sites to ensure our clinical trials are conducted properly and on time. While we will have agreements governing their activities, we will have limited influence over their actual performance. We will control only certain aspects of our CROs' activities. Nevertheless, we will be responsible for ensuring that each of our clinical studies is conducted in accordance with the applicable protocol, legal, regulatory and scientific standards, and our reliance on the CROs does not relieve us of our regulatory responsibilities. For example, the only clinical trial of

any of our product candidates or programs is being conducted by UCSF. If UCSF terminated the clinical trial of VY-AADC01, we would be required to find another party to conduct any new trials. We may be unable to find a new party to conduct new trials of our product candidates or obtain clinical supply of our product candidates or AAV vectors for such trials.

We and our CROs are required to comply with the FDA's GCPs for conducting, recording and reporting the results of IND-enabling studies and clinical studies to assure that the data and reported results are credible and accurate and that the rights, integrity and confidentiality of clinical trial participants are protected. The FDA enforces these GCPs through periodic inspections of trial sponsors, principal investigators and clinical trial sites. If we or our CROs fail to comply with applicable GCPs, the clinical data generated in our future clinical trials may be deemed unreliable and the FDA may require us to perform additional clinical trials before approving any marketing applications. Upon inspection, the FDA may determine that our clinical trials did not comply with GCPs. In addition, our future clinical trials will require a sufficient number of patients to evaluate the safety and effectiveness of our product candidates. Accordingly, if our CROs fail to comply with these regulations or fail to recruit a sufficient number of patients, we may be required to repeat such clinical trials, which would delay the regulatory approval process.

Our CROs are not our employees, and we are therefore unable to directly monitor whether or not they devote sufficient time and resources to our clinical and nonclinical programs. These CROs may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials or other drug development activities that could harm our competitive position. If our CROs do not successfully carry out their contractual duties or obligations, fail to meet expected deadlines, or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols or regulatory requirements, or for any other reasons, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval for, or successfully commercialize our product candidates. As a result, our financial results and the commercial prospects for our product candidates would be harmed, our costs could increase, and our ability to generate revenues could be delayed.

Risks Related to Manufacturing

Gene therapies are novel, complex and difficult to manufacture. We could experience manufacturing problems that result in delays in the development or commercialization of our product candidates or otherwise harm our business.

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

Our product candidates require processing steps that are more complex than those required for most chemical pharmaceuticals. Moreover, unlike chemical pharmaceuticals, the physical and chemical properties of a biologic such as ours generally cannot be fully characterized. As a result, assays of the finished product may not be sufficient to ensure that the product will perform in the intended manner. Accordingly, we and our collaborators employ multiple steps to control the manufacturing process to assure that the process works and the product candidate is made strictly and consistently in compliance with the process. 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 or insufficient inventory. We or our collaborators may encounter problems achieving adequate quantities and quality of clinical-grade materials that meet the FDA,

EMA or other applicable standards or specifications with consistent and acceptable production yields and costs.

In addition, the FDA, EMA and other foreign regulatory authorities may require us to submit samples of any lot of any approved product together with the protocols showing the results of applicable tests at any time. Under some circumstances, the FDA, EMA or other foreign regulatory authorities may require that we not distribute a lot until the agency authorizes its release. Slight deviations in the manufacturing process, including those affecting quality attributes and stability, may result in unacceptable changes in the product that could result in lot failures or product recalls. Lot failures or product recalls could cause us to delay product launches or clinical trials, which could be costly to us and otherwise harm our business, financial condition, results of operations and prospects.

We or our collaborators also may encounter problems hiring and retaining the experienced scientific, quality-control and manufacturing personnel needed to operate our manufacturing processes, which could result in delays in production or difficulties in maintaining compliance with applicable regulatory requirements.

Any problems in our or our collaborators' manufacturing process or facilities could make us a less attractive collaborator for potential partners, including larger pharmaceutical companies and academic research institutions, which could limit our access to additional attractive development programs. Problems in our or our collaborators' manufacturing process could restrict our ability to meet market demand for our products.

Delays in obtaining regulatory approval of our or our collaborators' manufacturing process and facility or disruptions in our manufacturing process may delay or disrupt our commercialization efforts. To date, no cGMP gene therapy manufacturing facility in the United States has received approval from the FDA for the manufacture of an approved gene therapy product.

Before we can begin to commercially manufacture our product candidates in our own facility, or the facility of a collaborator, we must obtain regulatory approval from the FDA for our or manufacturing process and our or our collaborator's facility. A manufacturing authorization must also be obtained from the appropriate European Union regulatory authorities. To date, no cGMP gene therapy manufacturing facility in the United States has received approval from the FDA for the manufacture of an approved gene therapy product and, therefore, the timeframe required for us to obtain such approval is uncertain. In addition, we must pass a pre-approval inspection of our or our collaborator's manufacturing facility by the FDA before any of our product candidates can obtain marketing approval. In order to obtain approval, we will need to ensure that all of our processes, methods and equipment are compliant with cGMP, and perform extensive audits of vendors, contract laboratories and suppliers. If any of our vendors, contract laboratories or suppliers is found to be out of compliance with cGMP, we may experience delays or disruptions in manufacturing while we work with these third parties to remedy the violation or while we work to identify suitable replacement vendors. The cGMP requirements govern quality control of the manufacturing process and documentation policies and procedures. In complying with cGMP, we will be obligated to expend time, money and effort in production, record keeping and quality control to assure that the product meets applicable specifications and other requirements. If we fail to comply with these requirements, we would be subject to possible regulatory action and may not be permitted to sell any products that we may develop.

Failure to comply with ongoing regulatory requirements could cause us to suspend production or put in place costly or time-consuming remedial measures.

The regulatory authorities may, at any time following approval of a product for sale, audit the manufacturing facilities for such product. If any such inspection or audit identifies a failure to comply

with applicable regulations, or if a violation of product specifications or applicable regulations occurs independent of such an inspection or audit, the relevant regulatory authority may require remedial measures that may be costly or time-consuming to implement and that may include the temporary or permanent suspension of a clinical trial or commercial sales or the temporary or permanent closure of a manufacturing facility. Any such remedial measures imposed upon our third-party manufacturers or us could harm our business, financial condition, results of operations and prospects.

If our third-party manufacturers or we fail to comply with applicable cGMP regulations, FDA and foreign regulatory authorities can impose regulatory sanctions including, among other things, refusal to approve a pending application for a new product candidate or suspension or revocation of a pre-existing approval. Such an occurrence may cause our business, financial condition, results of operations and prospects could be harmed.

Additionally, if supply from any third-party manufacturers is delayed or interrupted, there could be a significant disruption in the supply of our clinical or commercial material. We have an agreement in place with MassBiologics pursuant to which we are collaborating to establish scalable processes for manufacturing recombinant AAV vector products using cGMP, but we do not have any agreement in place with MassBiologics or any other party to manufacture clinical or commercial material. Therefore, if we are unable to enter into an agreement with MassBiologics or another manufacturer to manufacture clinical or commercial material, or if our agreement with MassBiologics were terminated, we would have to find suitable alternative manufacturers. This could delay our or our collaborators' ability to conduct clinical trials or commercialize our current and future product candidates. The regulatory authorities also may require additional trials if a new manufacturer is relied upon for commercial production. Switching manufacturers may involve substantial costs and could result in a delay in our desired clinical and commercial timelines.

Any contamination in the manufacturing process for our products, shortages of raw materials or failure of any of our key suppliers to deliver necessary components could result in delays in our clinical development or marketing schedules.

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

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

Interruptions in the supply of product candidates or inventory loss may harm our operating results and financial condition.

Our product candidates are manufactured using technically complex processes requiring specialized facilities, highly specific raw materials and other production constraints. The complexity of these processes, as well as strict government standards for the manufacture and storage of our product candidates, subjects us to manufacturing risks. While product candidate batches released for use in clinical trials or for commercialization undergo sample testing, some defects may only be identified following product release. In addition, process deviations or unanticipated effects of approved process changes may result in these intermediate products not complying with stability requirements or specifications. Our product candidates must be stored and transported at temperatures within a certain range. If these environmental conditions deviate, our product candidates' remaining shelf-lives could be

impaired or their efficacy and safety could be negatively impacted, making them no longer suitable for use.

The occurrence, or suspected occurrence, of manufacturing and distribution difficulties can lead to lost inventories and, in some cases, product recalls, with consequential reputational damage and the risk of product liability. The investigation and remediation of any identified problems can cause production delays, substantial expense, lost sales and delays of new product launches. Any interruption in the supply of finished products or the loss thereof could hinder our ability to timely distribute our products and satisfy customer demand. Any unforeseen failure in the storage of the product or loss in supply could delay our clinical trials and, if our product candidates are approved, result in a loss of our market share and negatively affect our business, financial condition, results of operations and prospects.

Risks Related to Our Business Operations

We may not be successful in our efforts to identify or discover additional product candidates and may fail to capitalize on programs or product candidates that may be a greater commercial opportunity, or for which there is a greater likelihood of success.

The success of our business depends upon our ability to identify, develop and commercialize product candidates generated through our product engine. Research programs to identify new product candidates require substantial technical, financial and human resources. Although VY-AADC01 is currently in clinical development and our other product candidates are in preclinical development, we may fail to identify other potential product candidates for clinical development for several reasons. For example, our research may be unsuccessful in identifying potential product candidates or our potential product candidates may be shown to have harmful side effects, may be commercially impracticable to manufacture or may have other characteristics that may make the products unmarketable or unlikely to receive marketing approval.

Additionally, because we have limited resources, we may forego or delay pursuit of opportunities with certain programs or product candidates or for indications that later prove to have greater commercial potential. Our spending on current and future research and development programs may not yield any commercially viable products. If we do not accurately evaluate the commercial potential for a particular product candidate, we may relinquish valuable rights to that product candidate through strategic collaboration, licensing or other arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate. Alternatively, we may allocate internal resources to a product candidate in a therapeutic area in which it would have been more advantageous to enter into a partnering arrangement.

If any of these events occur, we may be forced to abandon our development efforts with respect to a particular product candidate or fail to develop a potentially successful product candidate, which could harm our business, financial condition, results of operations and prospects.

Our future success depends on our ability to retain key members of our management team, and to attract, retain and motivate qualified personnel.

We are highly dependent on Steven M. Paul, M.D., our President and Chief Executive Officer as well as other members of our management team, the loss of whose services may adversely impact the achievement of our objectives. While we have entered into employment agreements or offer letters with each of our executive officers, any of them could leave our employment at any time, as all of our employees are "at will" employees. We currently do not have "key person" insurance on any of our employees. The loss of the services of one or more of our current employees might impede the achievement of our research, development and commercialization objectives.

Recruiting and retaining other qualified employees, consultants and advisors for our business, including scientific and technical personnel, also will be critical to our success. There currently is a shortage of skilled individuals with substantial gene therapy experience, which is likely to continue. As a result, competition for skilled personnel, including in gene therapy research and vector manufacturing, is intense and the turnover rate can be high. We may not be able to attract and retain personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies and academic institutions for individuals with similar skill sets. In addition, failure to succeed in preclinical or clinical trials or applications for marketing approval may make it more challenging to recruit and retain qualified personnel. The inability to recruit, or loss of services of certain executives, key employees, consultants or advisors, may impede the progress of our research, development and commercialization objectives and could harm our business, financial condition, results of operations and prospects.

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

If we are successful in executing our business strategy, we will need to expand our managerial, operational, financial and other systems and resources to manage our operations, continue our research and development activities and, in the longer term, build a commercial infrastructure to support commercialization of any of our product candidates that are approved for sale. We can provide no assurances that we will have sufficient resources in the future to manage all of our planned programs. Future growth would impose significant added responsibilities on members of management. It is likely that our management, finance, development personnel, systems and facilities currently in place may not be adequate to support this future growth. Our need to effectively manage our operations, growth and product candidates requires that we continue to develop more robust business processes and improve our systems and procedures in each of these areas and to attract and retain sufficient numbers of talented employees. We may be unable to successfully implement these tasks on a larger scale and, accordingly, may not achieve our research, development and growth goals.

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

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

rights, those actions could have a significant impact on our business, financial condition, results of operations and prospects, including the imposition of significant fines or other sanctions.

Healthcare legislative reform measures may harm our business and results of operations.

In the United States, there have been, and continue to be, several legislative initiatives to contain healthcare costs. For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or the Affordable Care Act, was passed, which substantially changes the way health care is financed by both the government and private insurers, and significantly impacts the U.S. pharmaceutical industry. The Affordable Care Act, among other things: (i) imposes 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; (ii) increases the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program; (iii) extends manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals enrolled in Medicaid managed care organizations; (iv) establishes an annual, nondeductible fee on any entity that manufactures or imports certain branded prescription drugs and biologic agents; (v) expands the availability of lower pricing under the 340B drug pricing program by expanding the types of entities eligible to participate in the program; and (vi) establishes a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D; (vii) expands entities eligible for discounts under the Public Health Services pharmaceutical pricing program; and (viii) initiates a new Patient Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research. Additionally, in the United States, the Biologics Price Competition and Innovation Act of 2009 created an abbreviated approval pathway for biologic products that are demonstrated to be "highly similar" or "biosimilar or interchangeable" with an FDA-approved biologic product. This new pathway could allow competitors to reference data from biologic products already approved after 12 years from the time of approval. This could expose us to potential competition by lower-cost biosimilars even if we commercialize a product candidate faster than our competitors.

Additional changes that may affect our business include those governing enrollment in federal healthcare programs, reimbursement changes, rules regarding prescription drug benefits under the health insurance exchanges and fraud and abuse and enforcement. Continued implementation of the Affordable Care Act and the passage of additional laws and regulations may result in the expansion of new programs such as Medicare payment for performance initiatives, and may impact existing government healthcare programs, such as by improving the physician quality reporting system and feedback program. Other legislative changes have been adopted since the Affordable Care Act was enacted, including aggregate reductions to Medicare payments to providers of up to 2% per fiscal year effective April 1, 2013. These reductions will stay in effect through 2024 unless additional congressional action is taken. Additionally, in January 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, which, among other things, reduced Medicare payments to several providers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. These new laws may result in additional reductions in Medicare and other healthcare funding, which could have a material adverse effect on customers for our drugs, if approved, and, accordingly, our financial operations. Further, as part of the proposed 2016 budget, President Obama has sought to reduce the current 12-year exclusivity period that a reference biologic is granted to a seven-year exclusivity period.

For each state that does not choose to expand its Medicaid program, there may be fewer insured patients overall, which could impact the sales, business and financial condition of manufacturers of branded prescription drugs. Where patients receive insurance coverage under any of the new options

made available through the Affordable Care Act, the possibility exists that manufacturers may be required to pay Medicaid rebates on that resulting drug utilization, a decision that could impact manufacturer revenues. The U.S. federal government also has announced delays in the implementation of key provisions of the Affordable Care Act. The implications of these delays for our and our partners' business and financial condition, if any, are not yet clear.

We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for our product candidates or additional pricing pressures. We cannot predict what healthcare reform initiatives may be adopted in the future. Further federal, state and foreign legislative and regulatory developments are likely, and we expect ongoing initiatives to increase pressure on drug pricing. Such reforms could have an adverse effect on anticipated revenues from product candidates that we may successfully develop and for which we may obtain regulatory approval and may affect our overall financial condition and ability to develop product candidates.

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

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

- the federal Anti-Kickback Statute, which prohibits, among other things, persons and entities from knowingly and willfully soliciting, receiving, offering or paying any remuneration (including any kickback, bribe or rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce or in return for either the referral of an individual for, or the purchase, recommendation, leasing or furnishing of, an item or service reimbursable under a federal healthcare program, such as the Medicare and Medicaid programs. This statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand, and prescribers, purchasers and formulary managers on the other. Further, the Affordable Care Act amends the intent requirement of the federal Anti-Kickback Statute. A person or entity no longer needs to have actual knowledge of this statute or specific intent to violate it;

- the federal civil and criminal false claims laws and civil monetary penalty laws, including the civil False Claims Act, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment or approval from Medicare, Medicaid or other government payors that are false or fraudulent, or making a false statement to avoid, decrease, or conceal an obligation to pay money to the federal government. The Affordable Care Act provides and recent government cases against pharmaceutical and medical device manufacturers support the view that federal Anti-Kickback Statute violations and certain marketing practices, including off-label promotion, may implicate the civil False Claims Act;

- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created additional federal criminal statutes that prohibit a person from knowingly and willfully executing or attempting to execute a scheme or from making false or fraudulent statements to defraud any healthcare benefit program, regardless of the payor (e.g., public or private);

- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH, and its implementing regulations, and as amended again by the final HIPAA omnibus rule, Modifications to the HIPAA Privacy, Security, Enforcement, and Breach Notification Rules Under HITECH and the Genetic Information Nondiscrimination Act; Other Modifications to HIPAA, published in January 2013, which imposes certain requirements relating to the privacy, security and transmission of individually identifiable health information without appropriate authorization by entities subject to the rule, such as health plans, health care clearinghouses and health care providers;

- federal transparency laws, including the federal Physician Payments Sunshine Act, that requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid, or the Children's Health Insurance Program, with specific exceptions, to report annually to CMS information related to payments and other transfers of value provided to physicians and teaching hospitals, and ownership and investment interests held by physicians and other healthcare providers and their immediate family members and applicable group purchasing organizations, by the 90th day of each subsequent calendar year, and disclosure of such information is made by CMS on a publicly available website; and

- state and/or foreign law equivalents of each of the above federal laws, such as state anti-kickback and false claims laws that may apply to arrangements and claims involving health care items or services reimbursed by non-governmental third party payors; state laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government; and state and foreign laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts in certain circumstances, such as specific disease states.

Because of the breadth of these laws and the narrowness of the statutory exceptions and safe harbors available, it is possible that some of our business activities could be subject to challenge under one or more of such laws. If our operations are found to be in violation of any of the laws described above or any other government regulations that apply to us, we may be subject to penalties, including civil and criminal penalties, damages, fines, exclusion from participation in government health care programs, such as Medicare and Medicaid, disgorgement, contractual damages, reputational harm, diminished profits and future earnings, imprisonment and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

The provision of benefits or advantages to physicians to induce or encourage the prescription, recommendation, endorsement, purchase, supply, order or use of medicinal products is prohibited in the European Union. The provision of benefits or advantages to physicians is also governed by the national anti-bribery laws of European Union Member States, such as the UK Bribery Act 2010. Infringement of these laws could result in substantial fines and imprisonment.

Payments made to physicians in certain European Union Member States must be publically disclosed. Moreover, agreements with physicians often must be the subject of prior notification and approval by the physician's employer, his or her competent professional organization and/or the regulatory authorities of the individual European Union Member States. These requirements are provided in the national laws, industry codes or professional codes of conduct, applicable in the European Union Member States. Failure to comply with these requirements could result in reputational risk, public reprimands, administrative penalties, fines or imprisonment.

The collection and use of personal health data in the European Union is governed by the provisions of the Data Protection Directive. This directive imposes several requirements relating to the consent of the individuals to whom the personal data relates, the information provided to the individuals, notification of data processing obligations to the competent national data protection authorities and the security and confidentiality of the personal data. The Data Protection Directive also imposes strict rules on the transfer of personal data out of the European Union to the United States. Failure to comply with the requirements of the Data Protection Directive and the related national data protection laws of the European Union Member States may result in fines and other administrative penalties. The draft Data Protection Regulation currently going through the adoption process is expected to introduce new data protection requirements in the European Union and substantial fines for breaches of the data protection rules. If the draft Data Protection Regulation is adopted in its current form it may increase our responsibility and liability in relation to personal data that we process and we may be required to put in place additional mechanisms ensuring compliance with the new data protection rules. This may be onerous and adversely affect our business, financial condition, results of operations and prospects.

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

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

- decreased demand for any product candidates that we may develop;
- loss of revenue;
- substantial monetary awards to trial participants or patients;
- significant time and costs to defend the related litigation;
- withdrawal of clinical trial participants;
- the inability to commercialize any product candidates that we may develop; and
- injury to our reputation and significant negative media attention.

Although we maintain product liability insurance coverage in the amount of $5.0 million per occurrence and $5.0 million in the aggregate, this insurance may not be adequate to cover all liabilities that we may incur. We anticipate that we will need to increase our insurance coverage each time we commence a clinical trial and if we successfully commercialize any product candidate. Insurance coverage is increasingly expensive. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise.

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

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the generation, handling, use, storage, treatment, manufacture, transportation and disposal of, and exposure to, hazardous materials and wastes, as well as laws and regulations relating to occupational health and safety. Our operations involve the use of hazardous and flammable materials, including chemicals and biologic and radioactive materials. Our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials. In

the event of contamination or injury resulting from our use of hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties.

Although we maintain workers' compensation insurance for certain costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials or other work related injuries, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for toxic tort claims that may be asserted against us in connection with our storage or disposal of biologic, hazardous or radioactive materials.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations, which have tended to become more stringent over time. These current or future laws and regulations may impair our research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions or liabilities, which could harm our business, financial condition, results of operations and prospects.

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

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

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

Our internal computer systems and those of our current and any future collaborators and other contractors or consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. While we have not experienced any such material system failure, accident or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a disruption of our development programs and our business operations, whether due to a loss of our trade secrets or other proprietary information or other similar disruptions. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability, our competitive position could be harmed and the further development and commercialization of our product candidates could be delayed.

Risks Related to the Commercialization of Our Product Candidates

The affected populations for our other product candidates may be smaller than we or third parties currently project, which may affect the addressable markets for our product candidates.

Our projections of the number of people who have the diseases we are seeking to treat, as well as the subset of people with these diseases who have the potential to benefit from treatment with our product candidates, are estimates based on our knowledge and understanding of these diseases. The total addressable market opportunity for our product candidates will ultimately depend upon a number of factors including the diagnosis and treatment criteria included in the final label, if approved for sale in specified indications, acceptance by the medical community, patient access and product pricing and reimbursement. Prevalence estimates are frequently based on information and assumptions that are not exact and may not be appropriate, and the methodology is forward-looking and speculative. The process we have used in developing an estimated prevalence range for the indications we are targeting has involved collating limited data from multiple sources. Accordingly, the prevalence estimates included in this prospectus should be viewed with caution. Further, the data and statistical information used in this prospectus, including estimates derived from them, may differ from information and estimates made by our competitors or from current or future studies conducted by independent sources.

The use of such data involves risks and uncertainties and is subject to change based on various factors. Our estimates may prove to be incorrect and new studies may change the estimated incidence or prevalence of the diseases we seek to address. The number of patients with the diseases we are targeting in the United States, the European Union and elsewhere may turn out to be lower than expected or may not be otherwise amenable to treatment with our products, or new patients may become increasingly difficult to identify or access, all of which would harm our results of operations and our business.

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

We currently have no sales and marketing organization. To successfully commercialize any products that may result from our clinical development programs, we will need to develop these capabilities, either on our own or with others. The establishment and development of our own commercial team or the establishment of a contract sales force to market any products we may develop will be expensive and time-consuming and could delay any product launch. Moreover, we cannot be certain that we will be able to successfully develop this capability. Under our collaboration agreement with Genzyme, we have granted Genzyme an exclusive option to license, develop and commercialize ex-U.S. rights to our advanced Parkinson's disease program, our Friedreich's ataxia program, a future program to be designated by Genzyme and our Huntington's disease program. Additionally, we have granted Genzyme an incremental option to co-commercialize our Huntington's disease program in the United States to our spinal muscular atrophy program. If Genzyme exercises any of these options, except for our advanced Parkinson's disease program, we would be eligible to receive specified option fees. In addition we would be eligible to receive specified milestone payments and royalties for any product developed in such programs. In the future, we may enter into collaborations regarding other of our product candidates with other entities to utilize their established marketing and distribution capabilities, but we may be unable to enter into such agreements on favorable terms, if at all. If any current or future collaborators do not commit sufficient resources to commercialize our products, or we are unable to develop the necessary capabilities on our own, we will be unable to generate sufficient product revenue to sustain our business. We compete with many companies that currently have extensive, experienced and well-funded medical affairs, marketing and sales operations to recruit, hire, train and retain marketing and sales personnel. We also face competition in our search for third parties to assist us with the sales and marketing efforts of our product candidates. Without an internal team or the support of a

third-party to perform marketing and sales functions, we may be unable to compete successfully against these more established companies.

Our efforts to educate the medical community and third-party payors on the benefits of our product candidates may require significant resources and may never be successful. Such efforts may require more resources than are typically required due to the complexity and uniqueness of our potential products. If any of our product candidates is approved but fails to achieve market acceptance among physicians, patients or third-party payors, we will not be able to generate significant revenues from such product, which could harm our business, financial condition, results of operations and prospects.

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

We expect the cost of a single administration of gene therapy products, such as those we are developing, to be substantial, when and if they achieve regulatory approval. We expect that coverage and reimbursement by government and private payors will be essential for most patients to be able to afford these treatments. Accordingly, sales of our product candidates will depend substantially, both domestically and abroad, on the extent to which the costs of our product candidates will be paid by health maintenance, managed care, pharmacy benefit and similar healthcare management organizations, or will be reimbursed by government authorities, private health coverage insurers and other third-party payors. Coverage and reimbursement by a third-party payor may depend upon several factors, including the third-party payor's determination that use of a product is:

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

No uniform policy requirement for coverage and reimbursement for drug products exists among third-party payors. Therefore, coverage and reimbursement for drug products can differ significantly from payor to payor. As a result, obtaining coverage and reimbursement for a product from third-party payors is a time-consuming and costly process that could require us to provide to each different payor supporting scientific, clinical and cost-effectiveness data. We may not be able to provide data sufficient to gain acceptance with respect to coverage and reimbursement. If coverage and reimbursement are not available, or are available only at limited levels, we may not be able to successfully commercialize our product candidates. Even if coverage is provided, the approved reimbursement amount may not be adequate to realize a sufficient return on our investment. Assuming we obtain coverage for a given product by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high. Patients who are prescribed medications for the treatment of their conditions, and their prescribing physicians, generally rely on third-party payors to reimburse all or part of the costs associated with their prescription drugs. Patients are unlikely to use our products unless coverage is provided and reimbursement is adequate to cover all or a significant portion of the cost of our products. Therefore, coverage and adequate reimbursement is critical to new product acceptance. Additionally, there may be significant delays in obtaining coverage and reimbursement for newly approved drugs and biologics, and coverage may be more limited than the purposes for which the drug is approved by the FDA or comparable foreign regulatory authorities.

There is significant uncertainty related to third-party coverage and reimbursement of newly approved products. In the United States, third-party payors, including government payors such as the Medicare and Medicaid programs, play an important role in determining the extent to which new drugs and biologics will be covered and reimbursed. The Medicare and Medicaid programs increasingly are used as models for how private payors and government payors develop their coverage and reimbursement policies. Currently, no gene therapy product has been approved for coverage and reimbursement by the Centers for Medicare & Medicaid Services, or CMS, the agency responsible for administering the Medicare program. It is difficult to predict what CMS will decide with respect to coverage and reimbursement for fundamentally novel products such as ours, as there is no body of established practices and precedents for these types of products. Moreover, reimbursement agencies in the European Union may be more conservative than CMS. For example, several cancer drugs have been approved for reimbursement in the United States and have not been approved for reimbursement in certain European Union Member States. It is difficult to predict what third-party payors will decide with respect to the coverage and reimbursement for our product candidates, especially given that the cost of our product candidates is likely to be very high and pricing of such products is highly uncertain.

Outside the United States, international operations generally are subject to extensive government price controls and other market regulations, and increasing emphasis on cost-containment initiatives in the European Union, Canada and other countries may put pricing pressure on us. For example, one gene therapy product was approved in the European Union in 2012 but is yet to be widely available commercially. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems. In general, the prices of medicines under such systems are substantially lower than in the United States. Other countries allow companies to fix their own prices for medical products, but monitor and control company profits. Additional foreign price controls or other changes in pricing regulation could restrict the amount that we are able to charge for our product candidates. Accordingly, in markets outside the United States, the reimbursement for our products may be reduced compared with the United States and may be insufficient to generate commercially reasonable product revenues.

Moreover, increasing efforts by government and third-party payors in the United States and abroad to cap or reduce healthcare costs may cause such organizations to limit both coverage and the level of reimbursement for new products approved and, as a result, they may not cover or provide adequate payment for our product candidates. Payors increasingly are considering new metrics as the basis for reimbursement rates, such as average sales price, or ASP, average manufacturer price, or AMP, and Actual Acquisition Cost. The existing data for reimbursement based on some of these metrics is relatively limited, although certain states have begun to survey acquisition cost data for the purpose of setting Medicaid reimbursement rates, and CMS has begun making pharmacy National Average Drug Acquisition Cost and National Average Retail Price data publicly available on at least a monthly basis. Therefore, it may be difficult to project the impact of these evolving reimbursement metrics on the willingness of payors to cover candidate products that we or our partners are able to commercialize. We expect to experience pricing pressures in connection with the sale of any of our product candidates due to the trend toward managed healthcare, the increasing influence of health maintenance organizations and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs and surgical procedures and other treatments, has become intense. As a result, increasingly high barriers are being erected to the entry of new products such as ours.

The commercial success of any of our product candidates will depend upon its degree of market acceptance by physicians, patients, third-party payors and others in the medical community.

Ethical, social and legal concerns about gene therapy could result in additional regulations restricting or prohibiting our products. Even with the requisite approvals from the FDA in the United States, EMA in the European Union and other regulatory authorities internationally, the commercial

success of our product candidates will depend, in part, on the acceptance of physicians, patients and health care payors of gene therapy products in general, and our product candidates in particular, as medically necessary, cost-effective and safe. Any product that we commercialize may not gain acceptance by physicians, patients, health care payors and others in the medical community. If these products do not achieve an adequate level of acceptance, we may not generate significant product revenue and may not become profitable. The degree of market acceptance of gene therapy products and, in particular, our product candidates, if approved for commercial sale, will depend on several factors, including:

- the efficacy and safety of such product candidates as demonstrated in clinical trials;
- the potential and perceived advantages of product candidates over alternative treatments;
- the cost of treatment relative to alternative treatments;
- the clinical indications for which the product candidate is approved by the FDA or the European Commission;
- patient awareness of, and willingness to seek, genotyping;
- the willingness of physicians to prescribe new therapies;
- the willingness of physicians to undergo specialized training with respect to administration of our product candidates;
- the willingness of the target patient population to try new therapies;
- the prevalence and severity of any side effects;
- product labeling or product insert requirements of the FDA, EMA or other regulatory authorities, including any limitations or warnings contained in a product's approved labeling;
- relative convenience and ease of administration;
- the strength of marketing and distribution support;
- the timing of market introduction of competitive products;
- publicity concerning our products or competing products and treatments; and
- sufficient third-party payor coverage and reimbursement.

Even if a potential product displays a favorable efficacy and safety profile in preclinical studies and clinical trials, market acceptance of the product will not be fully known until after it is launched.

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

Gene therapy remains a novel technology, with no gene therapy product approved to date in the United States and only one gene therapy product approved to date in the European Union. 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 who specialize in the treatment of genetic diseases targeted by our product candidates, prescribing treatments that involve the use of our product candidates in lieu of, or in addition to, existing treatments with which they are familiar and for which greater clinical data may be available. More restrictive government regulations or negative public opinion would have an adverse effect on our business, financial condition, results of operations and prospects and may delay or impair the

development and commercialization of our product candidates or demand for any products we may develop. For example, earlier gene therapy trials led to several well-publicized adverse events, including cases of leukemia and death seen in other trials using other vectors. Serious adverse events in our clinical trials, or other clinical trials involving gene therapy products or our competitors' products, even if not ultimately attributable to the relevant product candidates, and the resulting publicity, could result in increased government 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.

If we obtain approval to commercialize our product candidates outside of the United States, in particular in the European Union, a variety of risks associated with international operations could harm our business.

We expect that we will be subject to additional risks in commercializing our product candidates outside the United States, including:

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

Further, in many foreign countries it is common for others to engage in business practices that are prohibited by U.S. laws and regulations applicable to us, including the Foreign Corrupt Practices Act. Although we expect to implement policies and procedures designed to comply with these laws and policies, there can be no assurance that our employees, contractors and agents will comply with these laws and policies. If we are unable to successfully manage the challenges of international expansion and operations, our business and operating results could be harmed.

Risks Related to Our Intellectual Property

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

We are reliant upon licenses to 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 product candidates. These and other licenses may not provide exclusive rights to use such intellectual property and technology in all relevant fields of

use and in all territories in which we may wish to develop or commercialize our technology and products in the future. As a result, we may not be able to prevent competitors from developing and commercializing competitive products in territories included in all of our licenses.

In some circumstances, particularly in licenses with academic institutions, we may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, covering technology that we license from third parties. Therefore, we cannot be certain that these patents and applications will be prosecuted, maintained and enforced in a manner consistent with the best interests of our business. If our licensors fail to maintain such patents, or lose rights to those patents or patent applications, the rights we have licensed may be reduced or eliminated and our right to develop and commercialize any of our products that are the subject of such licensed rights could be adversely affected. In addition to the foregoing, the risks associated with patent rights that we license from third parties will also apply to patent rights we may own in the future.

Further, in many of our license agreements we are responsible for bringing any actions against any third party for infringing on the patents we have licensed. Certain of our license agreements also require us to meet development thresholds to maintain the license, including establishing a set timeline for developing and commercializing products and minimum yearly diligence obligations in developing and commercializing the product. Disputes may arise regarding intellectual property subject to a licensing agreement, including:

- 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 under our collaborative development relationships;
- our diligence obligations under the license agreement and what activities satisfy those diligence obligations;
- the inventorship or ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners; and
- the priority of invention of patented technology.

If disputes over intellectual property that we have licensed 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.

If we fail to comply with our obligations under these license agreements, or we are subject to a bankruptcy, the licensor may have the right to terminate the license, in which event we would not be able to market products covered by the license.

Furthermore, the research resulting in certain of our licensed patent rights and technology was funded by the U.S. government. As a result, the government may have certain rights, or march-in rights, to such patent rights and technology. When new technologies are developed with government funding, the government generally obtains certain rights in any resulting patents, including a non-exclusive license authorizing the government to use the invention for non-commercial purposes. These rights may permit the government to disclose our confidential information to third parties and to exercise march-in rights to use or allow third parties to use our licensed technology. The government can exercise its march-in rights if it determines that action is necessary because we fail to achieve practical application of the government-funded technology, because action is necessary to alleviate health or safety needs, to meet requirements of federal regulations or to give preference to U.S. industry. In addition, our rights in such inventions may be subject to certain requirements to manufacture products embodying such inventions in the United States. Any exercise by the government

of such rights could harm our competitive position, business, financial condition, results of operations and prospects.

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

Our success depends, in large part, on our ability to obtain and maintain patent protection in the United States and other countries with respect to our proprietary product candidates and manufacturing technology. Our licensors have sought and we intend to seek to protect our proprietary position by filing patent applications in the United States and abroad related to many of our novel technologies and product candidates that are important to our business.

The patent prosecution process is expensive, time-consuming and complex, and we may not be able to file, prosecute, maintain, enforce or license all necessary or desirable patent applications at a reasonable cost or in a timely manner. For example, in some cases, the work of certain academic researchers in the gene therapy field has entered the public domain, which may compromise our ability to obtain patent protection for certain inventions related to or building upon such prior work. Consequently, we will not be able to obtain any such patents to prevent others from using our technology for, and developing and marketing competing products to treat, these indications. It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has, in recent years, been the subject of much litigation. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain. Our pending and future patent applications may not result in patents being issued which protect our technology or product candidates or which effectively prevent others from commercializing competitive technologies and product candidates. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection.

We may not be aware of all third-party intellectual property rights potentially relating to our product candidates. Publications of discoveries in the scientific literature often lag the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing or, in some cases, not at all. Therefore, we cannot be certain that we were the first to make the inventions claimed in any owned or any licensed patents or pending patent applications, or that we were the first to file for patent protection of such inventions.

Even if the patent applications we license or may own in the future do issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors or other third parties from competing with us or otherwise provide us with any competitive advantage. Our competitors or other third parties may be able to circumvent our patents by developing similar or alternative technologies or products in a non-infringing manner.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in loss of exclusivity or in patent claims being narrowed, invalidated or held unenforceable, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and product candidates. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our intellectual property may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

Our intellectual property licenses with third parties may be subject to disagreements over contract interpretation, which could narrow the scope of our rights to the relevant intellectual property or technology or increase our financial or other obligations to our licensors.

The agreements under which we currently license intellectual property or technology from third parties are complex, and certain provisions in such agreements may be susceptible to multiple interpretations. The resolution of any contract interpretation disagreement that may arise could narrow what we believe to be the scope of our rights to the relevant intellectual property or technology, or increase what we believe to be our financial or other obligations under the relevant agreement, either of which could harm our business, financial condition, results of operations and prospects.

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

We currently have rights to certain intellectual property, through licenses from third parties, to develop our product candidates. Because our programs may require the use of proprietary rights held by third parties, the growth of our business likely will depend, in part, on our ability to acquire, in-license or use these proprietary rights. We may be unable to acquire or in-license any compositions, methods of use, processes or other intellectual property rights from third parties that we identify as necessary for our product candidates. The licensing or acquisition of third-party intellectual property rights is a competitive area, and several more established companies may pursue strategies to license or acquire third-party intellectual property rights that we may consider attractive. These established companies may have a competitive advantage over us due to their size, capital 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 non-profit and 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 be required to expend significant time and resources to redesign our product candidates or the methods for manufacturing them or to develop or license replacement technology, all of which may not be feasible on a technical or commercial basis. If we are unable to do so, we may be unable to develop or commercialize the affected product candidates, which could harm our business significantly.

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

Periodic maintenance fees, renewal fees, annuity fees and various other government fees on patents and/or applications will be due to be paid to the United States Patent and Trademark Office, or USPTO, and various government patent agencies outside of the United States over the lifetime of our licensed patents and/or applications and any patent rights we may own in the future. We rely on our outside counsel or our licensing partners to pay these fees due to non-U.S. patent agencies. The USPTO and various non-U.S. government patent agencies require compliance with several procedural,

documentary, fee payment and other similar provisions during the patent application process. We employ reputable law firms and other professionals to help us comply and we are also dependent on our licensors to take the necessary action to comply with these requirements with respect to our licensed intellectual property. In many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. There are situations, however, in which non-compliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, potential competitors might be able to enter the market and this circumstance could harm our business.

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

Filing, prosecuting and defending patents on product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States could be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we 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 United States. These products may compete with our products and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets and other intellectual property protection, particularly those relating to biotechnology products, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. For example, an April 2014 report from the Office of the United States Trade Representative identified a number of countries, including India and China, where challenges to the procurement and enforcement of patent rights have been reported. Several countries, including India and China, have been listed in the report every year since 1989. 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.

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

If one of our licensing partners or we initiate legal proceedings against a third party to enforce a patent covering one of our product candidates, the defendant could counterclaim that the patent covering our product candidate is invalid or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, lack of written description or non-enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld information material to patentability from the USPTO, or made a misleading statement, during

prosecution. Third parties also may raise similar claims before administrative bodies in the United States or abroad, even outside the context of litigation. Such mechanisms include re-examination, post grant review, *inter partes* review and equivalent proceedings in foreign jurisdictions. Such proceedings could result in the revocation or cancellation of or amendment to our patents in such a way that they no longer cover our product candidates. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art, of which the patent examiner and we or our licensing partners were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity or unenforceability, we could lose at least part, and perhaps all, of the patent protection on one or more of our product candidates. Such a loss of patent protection could harm our business.

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

Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which would be uncertain and could harm our business.

Our commercial success depends upon our ability and the ability of our collaborators to develop, manufacture, market and sell our product candidates and use our proprietary technologies without infringing the proprietary rights and intellectual property of third parties. The biotechnology and pharmaceutical industries are characterized by extensive and complex litigation regarding patents and other intellectual property rights. We may in the future become party to, or be threatened with, adversarial proceedings or litigation regarding intellectual property rights with respect to our product candidates and technology, including interference proceedings, post grant review and *inter partes* review before the USPTO. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future, regardless of their merit. There is a risk that third parties may choose to engage in litigation with us to enforce or to otherwise assert their patent rights against us. Even if we believe such claims are without merit, a court of competent jurisdiction could hold that these third-party patents are valid, enforceable and infringed, which could adversely affect our ability to commercialize our product candidates or any other of our product candidates or technologies covered by the asserted third-party patents. In order to successfully challenge the validity of any such U.S. patent in federal court, we would need to overcome a presumption of validity. As this burden is a high one requiring us to present clear and convincing evidence as to the invalidity of any such U.S. patent claim, there is no assurance that a court of competent jurisdiction would invalidate the claims of any such U.S. patent. If we are found to infringe a third party's valid and enforceable intellectual property rights, we could be required to obtain a license from such third party to continue developing, manufacturing and marketing our product candidates and technology. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors and other third parties access to the

same technologies licensed to us, and it could require us to make substantial licensing and royalty payments. We could be forced, including by court order, to cease developing, manufacturing and commercializing the infringing technology or product candidates. In addition, we could be found liable for monetary damages, including treble damages and attorneys' fees, if we are found to have willfully infringed a patent or other intellectual property right. A finding of infringement could prevent us from manufacturing and commercializing our product candidates or force us to cease some of our business operations, which could harm our business. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business, financial condition, results of operations and prospects.

Intellectual property litigation could cause us to spend substantial resources and distract our personnel from their normal responsibilities.

Competitors may infringe our patents or the patents of our licensing partners, or we may be required to defend against claims of infringement. To counter infringement or unauthorized use claims or to defend against claims of infringement can be expensive and time consuming. Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims 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 adequately conduct such litigation or proceedings. 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 and more mature and developed intellectual property portfolios. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could adversely affect our ability to compete in the marketplace.

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

Many of our employees, consultants or advisors are currently, or were previously, employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees, consultants and advisors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that these individuals or we have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such individual's current or former employer. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management.

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

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

Recent patent reform legislation could increase the uncertainties and costs surrounding the prosecution of patent applications and the enforcement or defense of issued patents. On September 16, 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes several significant changes to U.S. patent law. These include provisions that affect the way patent applications are prosecuted and also may affect patent litigation. These also include provisions that switched the United States from a "first-to-invent" system to a "first-to-file" system, allow third-party submission of prior art to the USPTO during patent prosecution and set forth additional procedures to attack the validity of a patent by the USPTO administered post grant proceedings. Under a first-to-file system, assuming the other requirements for patentability are met, the first inventor to file a patent application generally will be entitled to the patent on an invention regardless of whether another inventor had made the invention earlier. The USPTO recently developed new regulations and procedures to govern administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, and in particular, the first to file provisions, only became effective on March 16, 2013. Accordingly, it is not clear what, if any, impact the Leahy-Smith Act will have on the operation of our business. However, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could harm our business, financial condition, results of operations and prospects.

The patent positions of companies engaged in the development and commercialization of biologics and pharmaceuticals are particularly uncertain. Two cases involving diagnostic method claims and "gene patents" have recently been decided by the Supreme Court of the United States, or Supreme Court. On March 20, 2012, the Supreme Court issued a decision in Mayo Collaborative Services v. Prometheus Laboratories, Inc., or Prometheus, a case involving patent claims directed to a process of measuring a metabolic product in a patient to optimize a drug dosage for the patient. According to the Supreme Court, the addition of well-understood, routine or conventional activity such as "administering" or "determining" steps was not enough to transform an otherwise patent-ineligible natural phenomenon into patent-eligible subject matter. On July 3, 2012, the USPTO issued a guidance memo to patent examiners indicating that process claims directed to a law of nature, a natural phenomenon or a naturally occurring relation or correlation that do not include additional elements or steps that integrate the natural principle into the claimed invention such that the natural principle is practically applied and the claim amounts to significantly more than the natural principle itself should be rejected as directed to not patent-eligible subject matter. On June 13, 2013, the Supreme Court issued its decision in Association for Molecular Pathology v. Myriad Genetics, Inc., or Myriad, a case involving patent claims held by Myriad Genetics, Inc. relating to the breast cancer susceptibility genes BRCA1 and BRCA2. Myriad held that an isolated segment of naturally occurring DNA, such as the DNA constituting the BRCA1 and BRCA2 genes, is not patent eligible subject matter, but that complementary DNA, which is an artificial construct that may be created from RNA transcripts of genes, may be patent eligible.

On March 4, 2014, the USPTO issued a guidance memorandum to patent examiners titled 2014 Procedure For Subject Matter Eligibility Analysis Of Claims Reciting Or Involving Laws Of Nature/Natural Principles, Natural Phenomena, and/or Natural Products. These guidelines instruct USPTO examiners on the ramifications of the Prometheus and Myriad rulings and apply the Myriad ruling to natural products and principles including all naturally occurring nucleic acids. Patents for certain of our product candidates contain claims related to specific DNA sequences that are naturally occurring and, therefore, could be the subject of future challenges made by third parties. In addition, the recent USPTO guidance could make it impossible for us to pursue similar patent claims in patent applications we may prosecute in the future.

We cannot assure you that our efforts to seek patent protection for our technology and products will not be negatively impacted by the decisions described above, rulings in other cases or changes in guidance or procedures issued by the USPTO. We cannot fully predict what impact the Supreme Court's decisions in Prometheus and Myriad may have on the ability of life science companies to obtain or enforce patents relating to their products and technologies in the future. These decisions, the guidance issued by the USPTO and rulings in other cases or changes in USPTO guidance or procedures could have an adverse effect on our existing patent portfolio and our ability to protect and enforce our intellectual property in the future.

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

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

Depending upon the timing, duration and specifics of any FDA marketing approval of our product candidates, one or more of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, or Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit a patent extension term of up to five years as compensation for patent term lost during the FDA regulatory review process. A patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval, only one patent may be extended and only those claims covering the approved drug, a method for using it or a method for manufacturing it may be extended. However, we may not be granted an extension because of, for example, failing to exercise due diligence during the testing phase or regulatory review process, failing to apply within applicable deadlines, failing to apply prior to expiration of relevant patents or otherwise failing to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than we request. If we are unable to obtain patent term extension or the term of any such extension is less than we request, our competitors may obtain approval of competing products following our patent expiration, and our revenue could be reduced.

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

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

ineffective and could result in substantial costs and diversion of resources and could adversely impact our financial condition or results of operations.

Intellectual property rights do not necessarily address all potential threats.

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

- others may be able to make gene therapy products that are similar to our product candidates but that are not covered by the claims of the patents that we license or may own in the future;
- we, or our license partners or current or future collaborators, might not have been the first to make the inventions covered by the issued patent or pending patent application that we license or may own in the future;
- we, or our license partners or current or future collaborators, might not have been the first to file patent applications covering certain of our or their inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our owned or licensed intellectual property rights;
- it is possible that our pending patent applications or those that we may own in the future will not lead to issued patents;
- issued patents that we hold rights to may be held invalid or unenforceable, including as a result of legal challenges by our competitors;
- our competitors might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable;
- the patents of others may have an adverse effect on our business; and
- we may choose not to file a patent for certain trade secrets or know-how, and a third party may subsequently file a patent covering such intellectual property.

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

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 currently rely on certain third parties to manufacture all or part of our product candidates and to perform quality testing, and because we collaborate with various organizations and academic institutions for the advancement of our product engine and pipeline, we must, at times, share our proprietary technology and confidential information, including trade secrets, with them. We seek to protect our proprietary technology, in part, by entering into confidentiality agreements and, if applicable, material transfer agreements, collaborative research agreements, consulting agreements or other similar agreements with our collaborators, advisors, employees and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are inadvertently incorporated into the technology of others or are disclosed or used in violation of these agreements.

Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our proprietary technology and confidential information or other unauthorized use or disclosure would impair our competitive position and may harm our business, financial condition, results of operations and prospects.

Despite our efforts to protect our trade secrets, our competitors may discover our trade secrets, either through breach of these agreements, independent development or publication of information including our trade secrets by third parties. A competitor's discovery of our trade secrets would impair our competitive position and have an adverse impact on our business, financial condition, results of operations and prospects.

Risks Related to This Offering and Ownership of Our Common Stock

After this offering, our executive officers, directors and principal stockholders will maintain the ability to control all matters submitted to stockholders for approval.

Upon the completion of this offering, our executive officers, directors and stockholders who owned more than 5% of our outstanding common stock before this offering will, in the aggregate, beneficially own shares representing approximately % of our capital stock (or % if the underwriters exercise their option to purchase additional shares in full), assuming we issue the number of shares of common stock as set forth on the cover page of this prospectus. As a result, if these stockholders were to act together, they would be able to control all matters submitted to our stockholders for approval, as well as our management and affairs. For example, these persons, if they act together, would control the election of directors and approval of any merger, consolidation or sale of all or substantially all of our assets. This concentration of voting power could delay or prevent an acquisition of our company on terms that other stockholders may desire or result in management of our company that our public stockholders disagree with.

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

The initial public offering price of our common stock will be substantially higher than the net tangible book value per share of our common stock. Therefore, if you purchase shares of our common stock in this offering, you will pay a price per share that substantially exceeds our net tangible book value per share after this offering. To the extent outstanding options are exercised, you will incur further dilution. Based on the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, you will experience immediate dilution of $ per share, representing the difference between our pro forma net tangible book value per share after giving effect to this offering at the assumed initial public offering price. In addition, purchasers of common stock in this offering will have contributed approximately % of the aggregate price paid by all purchasers of our stock but will own only approximately % of our common stock outstanding after this offering (or % and %, respectively, if the underwriters exercise their option to purchase additional shares in full), excluding any shares they may have acquired prior to this offering. See the section titled "Dilution."

If securities or industry analysts do not publish research or reports about our business or if they publish inaccurate or negative evaluations of our business, the price of our stock could decline.

The trading market for our common stock will rely, in part, on the research and reports that industry or financial analysts publish about us or our business. We do not currently have, and may never obtain, research coverage by industry or financial analysts. If no, or few, analysts commence coverage of us, the trading price of our stock would likely decrease. Even if we do obtain analyst coverage, if one or more of the analysts covering our business downgrade their evaluations of our

stock, or publishes inaccurate or unfavorable research about our business, the price of our stock could decline. If one or more of these analysts cease to cover us or fails to publish reports on us regularly, we could lose visibility in the market for our stock, which in turn could cause our stock price to decline.

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

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

- regulatory action and results of clinical trials of our product candidates or those of our competitors;
- the success of competitive products or technologies;
- commencement or termination of collaborations;
- regulatory or legal developments in the United States and other countries;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- the level of expenses related to any of our product candidates or clinical development programs;
- the results of our efforts to discover, develop, acquire or in-license additional product candidates;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- general economic, industry and market conditions; and
- the other factors described in the section titled "Risk Factors" and elsewhere in this prospectus.

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. We believe that quarterly comparisons of our financial results are not necessarily meaningful and should not be relied upon as an indication of our future performance.

In the past, following periods of volatility in the market price of a company's securities, securities class-action litigation often has been instituted against that company. Such litigation, if instituted against us, could cause us to incur substantial costs to defend such claims and divert management's attention and resources, which could seriously harm our business, financial condition, results of operations and prospects.

We do not know whether an active and liquid trading market will develop for our common stock, and as a result, it may be difficult for you to sell your shares of our common stock at an acceptable price or at all.

Prior to this offering, there has been no public market for our common stock. The initial public offering price for our common stock will be determined through negotiations with the underwriters, and the negotiated price may not be indicative of the market value of our common stock after this offering. The market value of our common stock may decrease from the initial public offering price. Although we plan to have our common stock listed on The NASDAQ Global Market, an active trading market for our shares may never develop or be sustained following this offering. If an active market for our common stock does not develop, it may be difficult for you to sell shares you purchase in this offering without depressing the market price for the shares, or at all. Furthermore, an inactive market may also impair our ability to both raise capital by selling shares of our common stock and enter into strategic collaborations or acquire companies or products by using our shares of common stock as consideration.

We have broad discretion in the use of our cash and cash equivalents, including the net proceeds from this offering, and may not use them effectively.

Our management will have broad discretion in the application of our cash and cash equivalents, including the net proceeds from this offering, and could spend the proceeds in ways that do not improve our results of operations or enhance the value of our common stock. The failure by our management to apply these funds effectively could result in financial losses that could harm our business, cause the price of our common stock to decline and delay the development of our product candidates. Pending their use, we may invest our cash and cash equivalents, including the net proceeds from this offering, in a manner that does not produce income or that loses value. See "Use of Proceeds."

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

For so long as we remain an "emerging growth company," or EGC, as defined in the JOBS Act, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not EGCs. These exemptions include:

- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements;
- reduced disclosure obligations regarding executive compensation; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We may take advantages of these exemptions until we are no longer an EGC, We would cease to be an EGC upon the earlier of: (i) the last day of the fiscal year in which we have total annual gross revenues of $1.0 billion or more; (ii) the last day of the fiscal year following the fifth anniversary of the date of the completion of this offering; (iii) the date on which we have issued more than $1.0 billion in nonconvertible debt during the previous three years; or (iv) the date on which we are deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission or SEC, which means the first day of the year following the first year in which the market value of our common stock that is held by non-affiliates exceeds $700 million as of June 30.

We may choose to take advantage of some, but not all, of the available exemptions. We have taken advantage of reduced reporting burdens in this prospectus. In particular, we have not included all of the executive compensation information that would be required if we were not an EGC. We cannot predict whether investors will find our common stock less attractive if we rely on certain or all of these exemptions.

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

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

As a public company, and particularly after we are no longer an EGC, we will incur significant legal, accounting and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act of 2002 and rules subsequently implemented by the SEC and The NASDAQ Stock Market have imposed various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel will need to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. For example, we expect that these rules and regulations may make it more difficult and more expensive for us to obtain director and officer liability insurance, and we may be required to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. As a result, it may be more difficult for us to attract and retain qualified people to serve on our board of directors, our board committees or as executive officers.

Pursuant to Section 404 of the Sarbanes-Oxley Act of 2002, or Section 404, we will be required to furnish a report by our management on our internal control over financial reporting, including an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. However, while we remain an EGC, we will not be required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. To achieve compliance with Section 404 within the prescribed period, we will be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. In this regard, we will need to continue to dedicate internal resources, potentially engage outside consultants and adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to improve control processes as appropriate, validate through testing that controls are functioning as documented and implement a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that neither we nor our independent registered public accounting firm will be able to conclude within the prescribed timeframe that our internal control over financial reporting is effective as required by Section 404. This could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements.

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

Upon the completion of this offering, we will become subject to the periodic reporting requirements of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Our disclosure

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

These inherent limitations reflect the reality that judgments can be faulty, and that breakdowns can occur because of simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by an unauthorized override of the controls. Accordingly, because of the inherent limitations in our control system, misstatements due to error or fraud may occur and not be detected.

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

- establish a classified board of directors such that not all members of the board are elected at one time;
- allow the authorized number of our directors to be changed only by resolution of our board of directors;
- limit the manner in which stockholders can remove directors from the board;
- establish advance notice requirements for stockholder proposals that can be acted on at stockholder meetings and nominations to our board of directors;
- require that stockholder actions must be effected at a duly called stockholder meeting and prohibit actions by our stockholders by written consent;
- limit who may call stockholder meetings;
- authorize our board of directors to issue preferred stock without stockholder approval, which could be used to institute a stockholder rights plan, or so-called "poison pill," that would work to dilute the stock ownership of a potential hostile acquirer, effectively preventing acquisitions that have not been approved by our board of directors; and
- require the approval of the holders of at least 75% of the votes that all our stockholders would be entitled to cast to amend or repeal certain provisions of our amended and restated certificate of incorporation or bylaws.

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years

after the date of the transaction in which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner.

Our amended and restated certificate of incorporation designates the Court of Chancery of the State of Delaware as the sole and exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated certificate of incorporation, to be in effect upon the completion of this offering, provides that, unless we consent in writing to an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers and employees to us or our stockholders, (iii) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law, our certificate of incorporation or our bylaws or (iv) any action asserting a claim that is governed by the internal affairs doctrine, in each case subject to the Court of Chancery having personal jurisdiction over the indispensable parties named as defendants therein. Any person purchasing or otherwise acquiring any interest in any shares of our capital stock shall be deemed to have notice of and to have consented to this provision of our amended and restated certificate of incorporation. This choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or employees, which may discourage such lawsuits against us and our directors, officers and employees even though an action, if successful, might benefit our stockholders. Stockholders who do bring a claim in the Court of Chancery could face additional litigation costs in pursuing any such claim, particularly if they do not reside in or near the State of Delaware. The Court of Chancery may also reach different judgments or results than would other courts, including courts where a stockholder considering an action may be located or would otherwise choose to bring the action, and such judgments or results may be more favorable to us than to our stockholders. Alternatively, if a court were to find this provision of our amended and restated certificate of incorporation inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs which could have a material adverse effect on our business, financial condition or results of operations.

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

We have never declared or paid cash dividends on our capital stock. We currently intend to retain all of our future earnings, if any, to finance the growth and development of our business. In addition, the terms of any future debt agreements may preclude us from paying dividends. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future.

Sales of a substantial number of shares of our common stock in the public market could cause our stock price to fall.

If our existing stockholders sell, or indicate an intention to sell, substantial amounts of our common stock in the public market after the lock-up and other legal restrictions on resale discussed in this prospectus lapse, the market price of our common stock could decline. Based upon the number of shares of common stock, on an as-converted basis, outstanding as of March 31, 2015, immediately prior to the completion of this offering, we will have outstanding a total of shares of common stock, assuming no exercise of the underwriters' option to purchase an additional shares. Of these shares, as of the date of this prospectus, approximately shares of our common stock, plus any shares sold upon exercise of the underwriters' option to purchase additional shares, will be freely tradable, without restriction, in the public market immediately following this offering, assuming that

current stockholders do not purchase shares in this offering. The representatives of the underwriters, however, may, in their sole discretion, permit our officers, directors and other stockholders who are subject to these lock-up agreements to sell shares prior to the expiration of the lock-up agreements.

The lock-up agreements pertaining to this offering will expire 180 days from the date of this prospectus. After the lock-up agreements expire, based upon the number of shares of common stock, on an as-converted basis, outstanding as of March 31, 2015, up to an additional shares of common stock will be eligible for sale in the public market, approximately % of which shares are held by directors, executive officers and other affiliates and will be subject to certain limitations of Rule 144 under the Securities Act of 1933, as amended, or the Securities Act.

Upon completion of this offering, shares of common stock that are either subject to outstanding options, reserved for future issuance under our equity incentive plans or subject to outstanding warrants will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules, the lock-up agreements and Rule 144 and Rule 701 under the Securities Act. If these additional shares of common stock are sold, or if it is perceived that they will be sold, in the public market, the market price of our common stock could decline.

After this offering, the holders of approximately shares of our common stock will be entitled to rights with respect to the registration of their shares under the Securities Act, subject to the lock-up agreements described above. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares purchased by affiliates. Any sales of securities by these stockholders could have a negative impact on the market our common stock.

Our ability to utilize our net operating loss carryforwards and certain other tax attributes may be limited.

Under Section 382 of the Internal Revenue Code of 1986, as amended, if a corporation undergoes an "ownership change" (generally defined as a greater than 50% change (by value) in the ownership of its equity over a three year period), the corporation's ability to use its prechange net operating loss carryforwards and certain other pre-change tax attributes to offset its post-change income may be limited. We may have experienced such ownership changes in the past, and we may experience ownership changes in the future as a result of this offering or subsequent shifts in our stock ownership, some of which are outside the Company's control. As of December 31, 2014, we had federal and state net operating loss carryforwards of approximately $17.1 million and $16.0 million, respectively, which begin to expire in 2033, and federal and state research and development tax credit carryforwards of $0.4 million and $0.3 million, respectively, which begin to expire in 2028. Our ability to utilize those net operating loss carryforwards and research and development tax credit carryforwards could be limited by an "ownership change" as described above, which could result in an increased future tax liability to us.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements within the meaning of the federal securities laws, and these statements involve substantial risks and uncertainties. Forward-looking statements generally relate to future events or our future financial or operating performance. In some cases, you can identify forward-looking statements because they contain words such as "may," "will," "should," "expect," "plan," "anticipate," "could," "intend," "target," "project," "contemplate," "believe," "estimate," "predict," "potential" or "continue" or the negative of these words or other similar terms or expressions that concern our expectations, strategy, plans or intentions. Forward-looking statements contained in this prospectus include, but are not limited to, statements about:

- our ability to continue to advance VY-AADC01 through the current Phase 1b clinical trial and establish human proof-of-concept in the second half of 2016;
- our use of the net proceeds from this offering;
- the accuracy of our estimates regarding expenses, future revenues and capital requirements;
- our ability to continue to develop our product engine;
- our ability to develop a cGMP manufacturing capability for our product candidates;
- our ability to advance our other programs through preclinical development and into clinical trials, including filing of an additional IND in 2017, and successfully complete such clinical trials;
- regulatory developments in the United States and the European Union;
- our ability to obtain and maintain intellectual property protection for our proprietary assets;
- the size of the potential markets for our product candidates and our ability to serve those markets;
- the rate and degree of market acceptance of our product candidates for any indication once approved;
- our ability to obtain additional financing when needed; and
- the success of competing products that are or become available for the indications that we are pursuing.

We caution you that the foregoing list may not contain all of the forward-looking statements made in this prospectus.

You should not rely upon forward-looking statements as predictions of future events. We have based the forward-looking statements contained in this prospectus primarily on our current expectations and projections about future events and trends that we believe may affect our business, financial condition, results of operations and prospects. The outcome of the events described in these forward-looking statements is subject to risks, uncertainties and other factors described in the section titled "Risk Factors" and elsewhere in this prospectus. Moreover, we operate in a very competitive and rapidly changing environment. New risks and uncertainties emerge from time to time, and it is not possible for us to predict all risks and uncertainties that could have an impact on the forward-looking statements contained in this prospectus. The results, events and circumstances reflected in the forward-looking statements may not be achieved or occur and actual results, events or circumstances could differ materially from those described in the forward-looking statements.

The forward-looking statements made in this prospectus relate only to events as of the date on which the statements are made. We undertake no obligation to update or revise any forward-looking statements made in this prospectus to reflect events or circumstances after the date of this prospectus except as required by law. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make.

INDUSTRY AND MARKET DATA

We obtained the industry and market data in this prospectus from our own internal estimates and research, as well as from industry and general publications and research, surveys, studies and trials conducted by third parties. Some data is also based on our good faith estimates, which are derived from management's knowledge of the industry and independent sources. This data involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates. In addition, while we believe the market opportunity information included in this prospectus is reliable and is based upon reasonable assumptions, such data involves risks and uncertainties and are subject to change based on various factors, including those discussed in the section titled "Risk Factors."

USE OF PROCEEDS

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

Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the net proceeds to us from this offering by approximately $ million, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase (decrease) of 1,000,000 shares in the number of shares offered by us would increase (decrease) the net proceeds to us from this offering by approximately $ million, assuming the assumed initial public offering price, remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. A 1,000,000 share increase in the number of shares offered by us together with a concomitant $1.00 increase in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase the net proceeds to us from this offering by $ million after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Conversely, a 1,000,000 share decrease in the number of shares offered by us together with a concomitant $1.00 decrease in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would decrease the net proceeds to us from this offering by $ million after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

We currently expect to use the net proceeds from the offering as follows:

- $ million to fund the costs of future clinical development, including later-stage clinical trials, and manufacturing of VY-AADC01 for our program for advanced Parkinson's disease;
- $ million to fund the costs of additional preclinical development, manufacturing, clinical development, including Phase 1 and later-stage clinical trials, and internal personnel costs for our preclinical programs, including VY-SOD101 for the treatment of a monogenic form of ALS, VY-FXN01 for the treatment of Friedreich's ataxia, VY-HTT01 for the treatment of Huntington's disease and VY-SMN101 for the treatment of SMA; and
- the remainder to fund working capital and other general corporate purposes, which may include funding for new research and development activities, the hiring of additional personnel, capital expenditures and the costs of operating as a public company.

To the extent our actual net proceeds from this offering are insufficient to fund this allocation, we expect to use some of our existing cash and cash equivalents to fund any difference. We do not expect that our existing cash and cash equivalents and net proceeds from this offering alone will be sufficient to enable us to fund the completion of the development of any of our product candidates.

This expected use of the net proceeds from this offering represents our intentions based upon our current plans and business conditions. As of the date of this prospectus, we cannot predict with certainty all of the particular uses for the net proceeds to be received upon the completion of this offering or the amounts that we will actually spend on the uses set forth above. The amounts and timing of our actual expenditures and the extent of clinical development may vary significantly

depending on numerous factors, including the progress of our development efforts, the status of and results from preclinical studies and any current and future clinical trials, as well as any collaborations that we may enter into with third parties for our product candidates and any unforeseen cash needs. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering.

We may also use a portion of the net proceeds from this offering for the acquisition of, or investment in, complementary business, products or technologies, although we have no present commitments or agreements for any specific acquisitions or investments. Pending our use of the net proceeds from this offering, we intend to invest the net proceeds in a variety of capital preservation investments, including short-term, investment-grade, interest-bearing instruments and U.S. government securities.

DIVIDEND POLICY

We have never declared or paid cash dividends on our capital stock. We currently intend to retain all available funds and any future earnings, if any, to fund the development and expansion of our business, and we do not anticipate paying any cash dividends in the foreseeable future. Any future determination to pay cash dividends will be made at the discretion of our board of directors and will depend on restrictions and other factors our board of directors may deem relevant. Investors should not purchase our common stock with the expectation of receiving cash dividends.

CAPITALIZATION

The following table sets forth our cash, cash equivalents and capitalization as of March 31, 2015 on:

- an actual basis;
- a pro forma basis to give effect to (i) the automatic conversion of all outstanding shares of redeemable convertible preferred stock, into 55,000,000 shares of common stock immediately prior to the completion of this offering and (ii) the filing of our amended and restated certificate of incorporation immediately prior to the completion of this offering; and
- a pro forma as adjusted basis to give further effect to the pro forma adjustments set forth above and the sale of shares of common stock offered in this offering, assuming an initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

You should read this information together with our audited financial statements and related notes appearing elsewhere in this prospectus and the information set forth in the sections titled "Selected Financial Data" and "Management's Discussion and Analysis of Financial Condition and Results of Operations."

	As of March 31, 2015		
	Actual	Pro forma	Pro forma as adjusted[1]
	(unaudited)		
	(in thousands, except share and per share data)		
Cash and cash equivalents	$ 116,414	$ 116,414	$
Redeemable convertible preferred stock (Series A), $0.001 par value: 45,000,000 shares authorized, issued and outstanding, actual; 0 shares authorized, issued or outstanding, pro forma and pro forma as adjusted	$ 58,632	$ —	$
Redeemable convertible preferred stock (Series B), $0.001 par value: 10,000,000 shares authorized, issued and outstanding, actual; 0 shares authorized, issued or outstanding pro forma or pro forma as adjusted	25,342	—	
Stockholders' (deficit) equity			
Preferred stock, $0.001 par value: shares authorized actual; shares authorized pro forma; pro forma as adjusted; shares issued and outstanding, actual, pro forma or pro forma as adjusted	—	—	
Common stock, $0.001 par value: 75,000,000 shares authorized; 4,539,696 shares issued and outstanding, actual; 75,000,000 shares authorized, pro forma; 59,539,696 shares issued and outstanding, pro forma; shares authorized, pro forma as adjusted; shares issued and outstanding, pro forma as adjusted	5	60	
Additional paid-in capital	—	82,544	
Accumulated deficit	(36,102)	(34,727)	
Total stockholders' (deficit) equity	(36,097)	47,877	
Total capitalization	$ 47,877	$ 47,877	$

(1) Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus,

would increase (decrease) each of cash and cash equivalents, additional paid-in capital, total stockholders' equity and total capitalization on a pro forma as adjusted basis by approximately $ million, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase (decrease) of 1,000,000 shares in the number of shares offered by us would increase (decrease) each of cash and cash equivalents, additional paid-in capital, total stockholders' equity and total capitalization on a pro forma as adjusted basis by approximately $ million, assuming the assumed initial public offering price remains the same, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. A 1,000,000 share increase in the number of shares offered by us together with a concomitant $1.00 increase in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase each of cash and cash equivalents, total stockholders' equity and total capitalization by $ million, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Conversely, a 1,000,000 share decrease in the number of shares offered by us together with a concomitant $1.00 decrease in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would decrease each of cash and cash equivalents, total stockholders' equity and total capitalization by $ million, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The number of shares of our common stock shown as outstanding on an actual, pro forma and pro forma as adjusted basis in the table above excludes the following:

- 1,236,888 shares of common stock reserved for future issuance under our 2014 Stock Option and Grant Plan, as amended; and
- shares of common stock reserved for future issuance under our 2015 Stock Option and Incentive Plan, or 2015 Stock Option Plan, which will become effective immediately prior to the completion of this offering.

DILUTION

If you invest in our common stock in this offering, your ownership interest will be diluted to the extent of the difference between the initial public offering price per share of our common stock and the pro forma as adjusted net tangible book value per share of our common stock immediately after this offering. Net tangible book value per share is determined by dividing our total tangible assets less our total liabilities by the number of shares of common stock outstanding.

Our historical net tangible book value (deficit) as of March 31, 2015 was approximately $ million, or $ per share, based on shares of common stock outstanding as of March 31, 2015. Our pro forma net tangible book value (deficit) as of March 31, 2015 is approximately $ million, or $ per share, based on the total number of shares of common stock outstanding as of March 31, 2015, after giving effect to the automatic conversion of all outstanding shares of redeemable convertible preferred stock as of March 31, 2015 into shares of common stock immediately prior to the completion of this offering.

After giving further effect to the sale of shares of common stock in this offering at the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma as adjusted net tangible book value as of March 31, 2015 would have been $ million, or $ per share. This amount represents an immediate increase in pro forma as adjusted net tangible book value of $ per share to our existing stockholders and immediate dilution in net tangible book value of $ per share to new investors purchasing shares of common stock in this offering. The following table illustrates this dilution:

Assumed initial public offering price per share		$
Historical net tangible book value per share as of March 31, 2015	$	
Increase in pro forma net tangible book value per share attributable to the conversion of our convertible preferred stock		
Pro forma net tangible book value per share as of March 31, 2015		
Increase in net tangible book value per share attributable to new investors		
Pro forma as adjusted net tangible book value per share after this offering		
Dilution per share to new investors		$

Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted net tangible book value per share by $ million and the dilution to new investors in this offering by $ per share, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase (decrease) of 1,000,000 shares in the number of shares offered by us, would increase (decrease) the pro forma as adjusted net tangible book value after this offering by $ million and the dilution to new investors by $ per share, assuming the assumed initial public offering price remains the same, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. A 1,000,000 share increase in the number of shares offered by us together with a concomitant $1.00 increase in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase the pro forma as adjusted net tangible book value after this offering by $ per share and increase the dilution to new investors participating in this offering by $ per share, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Conversely, a 1,000,000 share decrease in the number of shares offered

by us together with a concomitant $1.00 decrease in the assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would decrease the pro forma as adjusted net tangible book value after this offering by $ per share and decrease the dilution to new investors participating in this offering by $ per share, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

If the underwriters exercise their option to purchase additional shares in full, the pro forma as adjusted net tangible book value per share of our common stock immediately after this offering would be $ per share, representing an increase to existing stockholders of $ per share, and an immediate dilution of $ per share to new investors. The information discussed above is illustrative only and will be adjusted based on the actual initial public offering price and other terms of this offering determined at pricing.

The following table summarizes, on a pro forma as adjusted basis as of , 2015, the differences between the number of shares of common stock purchased, the total consideration and the average price per share paid by existing stockholders (giving effect to the conversion of all outstanding shares of our convertible preferred stock into 55,000,000 shares of common stock immediately prior to the completion of this offering) and by new investors in this offering, at an assumed initial public offering price of $ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us:

	Shares Purchased		Total Consideration		Average Price Per Share
	Number	Percent	Amount	Percent	
			(in thousands)		
Existing stockholders		%	$	%	$
New investors					
Total		%	$	%	

If the underwriters exercise their option to purchase additional shares in full from us, our existing stockholders would own % and our new investors would own % of the total number of shares of our common stock outstanding after this offering.

The number of shares of common stock outstanding after this offering is based on 69,423,112 number of shares of our common stock outstanding as of March 31, 2015 (including 9,883,416 shares that are subject to repurchase by us and are not considered outstanding for accounting purposes until vested), and excludes the following:

- 1,236,888 shares of common stock reserved for future issuance under our 2014 Stock Option and Grant Plan, as amended; and
- shares of common stock reserved for future issuance under our 2015 Stock Option and Incentive Plan, which will become effective immediately prior to the completion of this offering.

New investors will experience further dilution if any of our outstanding options are exercised, new options are issued and exercised under our equity incentive plans or we issue additional shares of common stock, other equity securities or convertible debt securities in the future.

SELECTED FINANCIAL DATA

You should read the following selected financial data together with our financial statements and the related notes appearing at the end of this prospectus and the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations". We have derived the statements of operations data for the period and year ended December 31, 2013 and 2014, respectively, and the balance sheet data as of December 31, 2013 and 2014 from our audited financial statements included elsewhere in this prospectus. We have derived the statements of operations data for the three months ended March 31, 2014 and 2015 and the balance sheet data as of March 31, 2015 from our unaudited financial statements included elsewhere in this prospectus. The unaudited financial data have been prepared on the same basis as the audited financial statements and, in management's opinion, include all adjustments, consisting only of normal recurring adjustments, necessary for a fair presentation of the financial information as of and for the periods presented. Our historical results are not necessarily indicative of the results that should be expected in the future, and results for the three months ended March 31, 2015 are not necessarily indicative of the results to be expected for the full year ending December 31, 2015.

	Period from June 19, 2013 (inception) to December 31, 2013	Year Ended December 31, 2014	Three Months Ended March 31,	
			2014	2015
			(unaudited)	
	(in thousands, except share and per share data)			
Statements of Operations Data:				
Collaboration revenue	$ —	$ —	$ —	$ 2,576
Operating expenses:				
Research and development	2,316	8,898	1,432	5,523
General and administrative	1,450	5,469	1,553	1,881
Total operating expenses	3,766	14,367	2,985	7,404
Operating loss	(3,766)	(14,367)	(2,985)	(4,828)
Other expense, net	(67)	(1,950)	(67)	(9,749)
Net loss	$ (3,833)	$ (16,317)	$ (3,052)	$ (14,577)
Net loss per share, basic and diluted[(1)]	$ (383.30)	$ (6.55)	$ (1.63)	$ (3.72)
Weighted-average common shares outstanding, basic and diluted[(1)]	10,000	2,700,696	1,968,333	4,255,824
Pro forma net loss per share, basic and diluted (unaudited)[(1)]		$ (0.88)		$ (0.10)
Pro forma weighted-average common shares outstanding, basic and diluted (unaudited)[(1)]		16,297,956		46,700,268

	December 31, 2013	December 31, 2014	March 31, 2015 (unaudited)
		(in thousands)	
Balance Sheet Data:			
Cash and cash equivalents	$ 135	$ 7,035	$ 116,414
Working capital[(2)]	(3,847)	5,884	94,812
Total assets	149	11,497	120,332
Long term deferred revenue	—	—	48,842
Redeemable convertible preferred stock	—	21,979	83,974
Total stockholders' deficit	(3,833)	(20,830)	(36,097)

(1) See Statements of Operations and Note 2 to our financial statements for further details on the calculation of basic and diluted net loss per share attributable to common stockholders.

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

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

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

We are a clinical-stage gene therapy company focused on developing life-changing treatments for patients suffering from severe diseases of the CNS. We focus on CNS diseases where we believe an adeno-associated virus gene therapy approach that either increases or decreases the production of a specific protein can slow or reduce the symptoms experienced by patients, and therefore have a clinically meaningful impact. We have created a product engine, which enables us to engineer, optimize, manufacture and deliver our adeno-associated virus, or AAV, -based gene therapies that have the potential to provide durable efficacy following a single administration directly to the CNS. Our product engine has rapidly generated programs for five CNS indications, including advanced Parkinson's disease; a monogenic form of ALS; Friedreich's ataxia; Huntington's disease; and SMA. Our most advanced clinical candidate, VY-AADC01, is being evaluated for the treatment of advanced Parkinson's disease in an open-label, Phase 1b clinical trial with the goal of generating human proof-of-concept data in the second half of 2016. Our goal is to submit our next IND in 2017.

Since our inception on June 19, 2013, our operations have focused on organizing and staffing our company, business planning, raising capital, establishing our intellectual property portfolio, determining which CNS indications to pursue and conducting preclinical studies and clinical trials. We do not have any product candidates approved for sale and have not generated any revenue from product sales. We have funded our operations primarily through private placements of our Series A redeemable convertible Preferred Stock, which we refer to as our Series A Preferred Stock, and Series B redeemable convertible Preferred Stock, which we refer to as our Series B Preferred Stock and together with our Series A Preferred Stock, our redeemable convertible preferred stock, and our collaboration with Genzyme, or the Genzyme Collaboration, which commenced in February 2015. From inception through March 31, 2015, we have raised an aggregate of $75.0 million of gross proceeds from sales of our redeemable convertible preferred stock and convertible promissory notes, and additionally received a $65.0 million up-front payment from the Genzyme Collaboration to fund our operations. Subsequently, in April 2015 we sold additional convertible preferred stock for aggregate gross proceeds of $60.0 million.

Since inception, we have incurred significant operating losses. Our net losses were $3.8 million and $16.3 million for the period and year ended December 31, 2013 and 2014, respectively, and $14.6 million for the three months ended March 31, 2015. As of March 31, 2015, we had an accumulated deficit of $36.1 million. We expect to continue to incur significant expenses and operating losses for the foreseeable future. We anticipate that our expenses will increase significantly in connection with our ongoing activities, as we:

- continue investment in our product engine, including preclinical development of our programs and moving such programs into clinical development, and manufacturing facilities;
- continue clinical development of VY-AADC01 as a treatment for advanced Parkinson's disease;
- continue preclinical development of our other programs and begin moving such other programs into clinical development;
- hire additional research, development and business personnel;

- maintain, expand and protect our intellectual property portfolio; and
- incur additional costs associated with operating as a public company upon the completion of this offering.

Financial Operations Overview

Revenue

To date, we have not generated any revenue from product sales and do not expect to generate any revenue from product sales for the forseeable future. For the three months ended March 31, 2015, we recognized $2.6 million of collaboration revenue from the Genzyme Collaboration. For additional information about our revenue recognition policy related to the Genzyme Collaboration, see the section titled "—Critical Accounting Policies and Estimates—Revenue."

For the foreseeable future, we expect substantially all of our revenue will be generated from the Genzyme Collaboration, and any other strategic relationships we may enter into. If our development efforts are successful, we may also generate revenue from product sales.

Expenses

Research and Development Expenses

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

- employee-related expenses including salaries, benefits and stock-based compensation expense;
- costs of funding research performed by third parties that conduct research and development, preclinical activities, manufacturing and production design on our behalf;
- the cost of purchasing lab supplies and non-capital equipment used in designing, developing and manufacturing preclinical study materials;
- consultant fees;
- facility costs including rent, depreciation and maintenance expenses; and
- fees for maintaining licenses under our third-party licensing agreements.

Research and development costs are expensed as incurred. Costs for certain activities, such as manufacturing and preclinical studies and clinical trials, are generally recognized based on an evaluation of the progress to completion of specific tasks using information and data provided to us by our vendors and collaborators.

At this time, we cannot reasonably estimate or know the nature, timing and estimated costs of the efforts that will be necessary to complete the development of our product candidates. We are also unable to predict when, if ever, material net cash inflows will commence from sales of our product candidates. This is due to the numerous risks and uncertainties associated with developing such product candidates, including the uncertainty of:

- successful enrollment in and completion of clinical trials;
- establishing an appropriate safety profile;
- establishing commercial manufacturing capabilities or making arrangements with third-party manufacturers;
- receipt of marketing approvals from applicable regulatory authorities;

- commercializing the product candidates, if and when approved, whether alone or in collaboration with others;
- obtaining and maintaining patent and trade secret protection and regulatory exclusivity for our product candidates;
- continued acceptable safety profiles of the products following approval; and
- retention of key research and development personnel.

A change in the outcome of any of these variables with respect to the development of any of our product candidates would significantly change the costs, timing and viability associated with the development of that product candidate.

Research and development activities are central to our business model. We expect research and development costs to increase significantly for the foreseeable future as our development programs progress, including as we continue to support the Phase 1b clinical trial of VY-AADC01 as a treatment for advanced Parkinson's disease, and move such product candidate into additional clinical trials. There are numerous factors associated with the successful commercialization of any of our product candidates, including future trial design and various regulatory requirements, many of which cannot be determined with accuracy at this time based on our stage of development. Additionally, future commercial and regulatory factors beyond our control will impact our clinical development programs and plans.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and other related costs, including stock-based compensation, for personnel in executive, finance, accounting, business development, legal and human resource functions. Other significant costs include corporate facility costs not otherwise included in research and development expenses, legal fees related to patent and corporate matters and fees for accounting and consulting services.

We anticipate that our general and administrative expenses will increase in the future to support continued research and development activities, including the continuation of the Phase 1b clinical trial of VY-AADC01 and the initiation of our clinical trials for our other product candidates. These increases will likely include increased costs related to the hiring of additional personnel and fees to outside consultants. We also anticipate increased expenses associated with being a public company, including costs for audit, legal, regulatory and tax-related services, director and officer insurance premiums and investor relations costs.

Other Income (Expense)

Other income (expense) consists primarily of the re-measurement losses associated with the change in the fair value of the Series A Preferred Stock tranche rights for the Series A Preferred Stock. In February 2015, upon the issuance of the final tranche of Series A Preferred Stock, the tranche right liability was reclassified to Series A Preferred Stock and no further re-measurement gains or losses will be recognized related to these tranche rights.

Critical Accounting Policies and Estimates

Our management's discussion and analysis of our financial condition and results of operations are based on our financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles. The preparation of these financial statements requires us to make judgments and estimates that affect the reported amounts of assets, liabilities, revenues and expenses and the disclosure of contingent assets and liabilities in our financial statements. We base our estimates on historical experience, known trends and events, and various other factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates under different

assumptions or conditions. On an ongoing basis, we evaluate our judgments and estimates in light of changes in circumstances, facts and experience. The effects of material revisions in estimates, if any, will be reflected in the financial statements prospectively from the date of change in estimates.

While our significant accounting policies are described in more detail in the notes to our financial statements appearing elsewhere in this prospectus, we believe the following accounting policies used in the preparation of our financial statements require the most significant judgments and estimates.

Revenue

As of March 31, 2015, all of our revenue was generated exclusively from the Genzyme Collaboration. We recognize revenue in accordance with Financial Accounting Standards Board, or FASB, Accounting Standards Codification, or ASC, Topic 605 *Revenue Recognition*, or ASC 605. Accordingly, revenue is recognized for each unit of accounting when all of the following criteria are met:

- persuasive evidence of an arrangement exists;
- delivery has occurred or services have been rendered;
- the seller's price to the buyer is fixed or determinable; and
- collectability is reasonably assured.

Amounts received prior to satisfying the revenue recognition criteria are recorded as deferred revenue in our balance sheets. Amounts expected to be recognized as revenue within the 12 months following the balance sheet date are classified as deferred revenue, current portion. Amounts not expected to be recognized as revenue within the 12 months following the balance sheet date are classified as deferred revenue, net of current portion.

Multiple Elements Arrangements

Determination of Accounting Units

We analyze multiple element arrangements based on the guidance in FASB ASC Topic 605-25, *Revenue Recognition—Multiple Element Arrangements*, or ASC 605-25. Pursuant to the guidance in ASC 605-25, we evaluate multiple element arrangements to determine (1) the deliverables included in the arrangement and (2) whether the individual deliverables represent separate units of accounting or whether they must be accounted for as a combined unit of accounting. This evaluation involves subjective determinations and requires management to make judgments about the individual deliverables and whether such deliverables are separate from other aspects of the contractual relationship. Deliverables are considered separate units of accounting provided that: (i) the delivered item(s) has value to the customer on a standalone basis and (ii) if the arrangement includes a general right of return relative to the delivered item(s), delivery or performance of the undelivered item(s) is considered probable and substantially within our control. In assessing whether an item has standalone value, we consider factors such as the research, manufacturing and commercialization capabilities of the collaboration partner and the availability of the associated expertise in the general marketplace. We also consider whether our collaboration partner can use the other deliverable(s) for their intended purpose without the receipt of the remaining element(s), whether the value of the deliverable is dependent on the undelivered item(s) and whether there are other vendors that can provide the undelivered element(s). The Genzyme Collaboration does not provide for a general right of return relative to any delivered items.

Options are considered substantive if, at the inception of the arrangement, we are at risk as to whether the collaboration partner will choose to exercise the option. Factors that we consider in evaluating whether an option is substantive include the cost to exercise the option, the overall objective of the arrangement, the benefit the collaborator might obtain from the arrangement without exercising

the option and the likelihood the option will be exercised. When an option is considered substantive, we do not consider the option or item underlying the option to be a deliverable at the inception of the arrangement and the associated option fees are not included in allocable consideration, assuming the option is not priced at a significant and incremental discount. Conversely, when an option is not considered substantive, we would consider the option, including other deliverables contingent upon the exercise of the option, to be a deliverable at the inception of the arrangement and a corresponding amount would be included in allocable arrangement consideration. In addition, if the price of the option includes a significant incremental discount, the option would be included as a deliverable at the inception of the arrangement.

Allocation of Arrangement Consideration

Arrangement consideration that is fixed or determinable is allocated among the separate units of accounting using the relative selling price method. The applicable revenue recognition criteria in ASC 605 are applied to each of the separate units of accounting in determining the appropriate period and pattern of recognition. We determine the selling price of a unit of accounting following the hierarchy of evidence prescribed by ASC 605-25. Accordingly, we determine the estimated selling price for units of accounting within each arrangement using vendor specific objective evidence, or VSOE, of selling price, if available, third party evidence, or TPE, of selling price if VSOE is not available, or best estimate of selling price, or BESP, if neither VSOE or TPE is available. We have only used BESP to estimate the selling price, since we have not had VSOE or TPE of selling price for any units of accounting to date. Determining BESP for a unit of accounting requires significant judgment. In developing the BESP for a unit of accounting, we consider applicable market conditions and relevant entity specific factors, including factors that were contemplated in negotiating the agreement with the customer and estimated costs. We validate BESP for units of accounting by evaluating whether changes in the key assumptions used by us to determine the BESP will have a significant effect on the allocation of arrangement consideration between multiple units of accounting.

Pattern of Recognition

We recognize the arrangement's consideration allocated to each unit of accounting when all of the revenue recognition criteria in ASC 605 are satisfied for that particular unit of accounting. We will recognize revenue associated with license options upon exercise of the option, if the underlying license has standalone value from the other deliverables to be provided after delivering that license. If the license does not have standalone value, the amounts allocated to the license option will be combined with the related undelivered items as a single unit of accounting. The amounts allocated to the license option in the Genzyme Collaboration will be deferred until the option is exercised. The revenue recognition upon option exercise will be determined based on whether the license has standalone value from the remaining deliverables under the arrangement at the time of exercise.

We recognize the amounts associated with research and development services, alliance joint steering committees and development advisory committees ratably over the associated period of performance. If there is no discernible pattern of performance or objectively measurable performance measures do not exist, then we recognize revenue under the arrangement on a straight-line basis over the period that we are expected to complete our performance obligations. Conversely, if the pattern of performance in which the service is provided to the customer can be determined and objectively measureable performance exists, then we recognize revenue under the arrangement using the proportional performance method. Revenue recognized is limited to the lesser of the cumulative amount of payments received or the cumulative revenue earned determined using the straight line method or proportional performance, as applicable, as of the period end date.

Recognition of Milestones and Royalties

At the inception of an arrangement that includes milestone payments, we evaluate whether each milestone is substantive and at risk to both parties on the basis of the contingent nature of the milestone. This evaluation includes an assessment of whether: (i) the consideration is commensurate with either our performance to achieve the milestone or the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from our performance to achieve the milestone, (ii) the consideration relates solely to past performance and (iii) the consideration is reasonable relative to all of the deliverables and payment terms within the arrangement. We evaluate factors such as clinical, regulatory, commercial and other risks that must be overcome to achieve the respective milestone and the level of effort and investment required to achieve the respective milestone in making this assessment. There is considerable judgment involved in determining whether a milestone satisfies all of the criteria required to conclude that a milestone is substantive. In accordance with FASB ASC Topic 605-28, *Revenue Recognition—Milestone Method*, or ASC 605-28, clinical and regulatory milestones that are considered substantive, will be recognized as revenue in its entirety upon successful accomplishment of the milestone, assuming all other revenue recognition criteria are met. Milestones that are not considered substantive would be recognized as revenue over the remaining period of performance, assuming all other revenue recognition criteria are met. Revenue from commercial milestone payments will be accounted for as royalties and recorded as revenue upon achievement of the milestone, assuming all other revenue recognition criteria are met.

We will recognize royalty revenue in the period of sale of the related product(s), based on the underlying contract terms, provided that the reported sales are reliably measurable, we have no remaining performance obligations, and assuming all other revenue recognition criteria are met.

Classifications of Payments to Customers

We also consider the impact of potential future payments we make in our role as a vendor to our customers or collaboration partners and evaluate if these potential future payments could be reductions of revenue from that customer. If the potential future payments to the customer are (i) a separately identifiable benefit and (ii) the fair value of the identifiable benefit can be reasonably estimated, then the payments are accounted for separately from the revenue received from the customer. If however, both of these criteria are not satisfied, then the payments are treated as a reduction of revenue.

Accrued Research and Development Expenses

As part of the process of preparing our financial statements, we are required to estimate our accrued expenses as of each balance sheet date. This process involves reviewing open contracts and purchase orders, communicating with our personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of the actual cost. The majority of our service providers invoice us monthly in arrears for services performed or when contractual milestones are met. We make estimates of our accrued expenses as of each balance sheet date based on facts and circumstances known to us at that time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments if necessary. The significant estimates in our accrued research and development expenses include the costs incurred for services performed by our vendors in connection with research and development activities for which we have not yet been invoiced.

We record our expenses related to research and development activities on our estimates of the services received and efforts expended pursuant to quotes and contracts with vendors that conduct research and development on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the research and development expense. 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. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or prepaid accordingly. Non-refundable advance payments for goods and services that will be used in future research and development activities are expensed when the activity has been performed or when the goods have been received rather than when the payment is made.

Although we do not expect our estimates to be materially different from amounts actually incurred, if our estimates of the status and timing of services performed differ from the actual status and timing of services performed, it could result in us reporting amounts that are too high or too low in any particular period. To date, there have been no material differences between our estimates of such expenses and the amounts actually incurred.

Fair Value Measurements—Tranche Rights

The January 2014 Series A Preferred Stock Purchase Agreement provides the investors the right, and upon achievement of certain milestones, obligates the investors to participate in subsequent offerings of Series A Preferred Stock, or Tranche Rights. The Tranche Rights meet the definition of a freestanding financial instrument, as the Tranche Rights are legally detachable and separately exercisable from the Series A Preferred Stock. Since the Series A Preferred Stock is redeemable at the holder's option, the Tranche Rights are classified as an asset or liability and are initially recorded at fair value and marked to market at each subsequent reporting period, through the settlement of the Tranche Rights.

We determine fair value utilizing the concept of "Fair Value" from FASB ASC Topic 820, Fair Value Measurement, or ASC 820, that states that any fair value measurement requires that the reporting entity to determine the valuation technique(s) appropriate for the measurement, considering the availability of data with which to develop inputs that represent the assumptions that market participants would use in pricing the asset or liability and the level in the fair value hierarchy within which the inputs are categorized.

The estimated fair value of the Tranche Rights was determined using a probability-weighted present value model that considers the probability of closing a tranche, the estimated future value of Series A Preferred Stock at each closing, and the amount of the investment required at each closing. Future values are converted to present value using a discount rate appropriate for probability-adjusted cash flows. Upon the settlement of each tranche, the fair value of the Tranche Rights associated with that tranche was reclassified to Series A Preferred Stock at its then fair value and is no longer re-measured.

Stock-based Compensation

We issue stock-based awards to employees and non-employees, which have historically been in the form of restricted stock, but expect to grant stock options in future periods. Stock-based payments to employees are recognized as expense in the statements of operations based on their grant date fair values. We initially value restricted stock awards granted to non-employees at their grant date fair values and subsequently revalue these awards based on changes in the fair value of our common stock. We expense the fair value of our restricted stock awards to employees subject to time based vesting on a straight-line basis over the associated service period in which the related services are received. Awards of restricted stock to non-employees are adjusted through stock-based compensation expense at each reporting period end to reflect the current fair value of such awards and expensed on a straight-line basis over the period the related services are received.

We record the expense for restricted stock award grants subject to performance-based milestone vesting over the remaining service period when management determines that achievement of the milestone is probable. Management evaluates when the achievement of a performance-based milestone

is probable based on the relative satisfaction of the performance conditions as of the reporting date. As of December 31, 2014 and March 31, 2015, management concluded that achievement of such performance-based milestones was not probable.

The amount of stock-based compensation expense recognized during a period is based on the value of the portion of the awards that are expected to vest. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. The term "forfeitures" is distinct from "cancellations" or "expirations" and represents only the unvested portion of the surrendered award. We evaluate our forfeiture rate at each reporting period.

The following table presents the grant dates, numbers of underlying shares of common stock and the per share purchase prices of shares of restricted stock granted between June 19, 2013 (inception) and March 31, 2015, along with the fair value per share utilized to calculate stock-based compensation expense:

Date of issuance	Type of Award	Number of Shares	Purchase Price of Award per Share	Fair Value of Common Stock per Share on Grant Date
1/8/2014	Restricted Stock	5,050,000	$ 0.001	$ 0.12
4/16/2014	Restricted Stock	2,240,612	0.01	0.12
8/19/2014	Restricted Stock	4,000,000	0.01	0.26
9/24/2014	Restricted Stock	305,000	0.01	0.26
12/16/2014	Restricted Stock	717,500	0.01	0.26

Stock-based compensation totaled approximately $0.4 million for the year ended December 31, 2014 and $0.3 million for the three months ended March 31, 2015. As of March 31, 2015, we had $3.6 million of total unrecognized compensation expense, which is expected to be recognized over a weighted-average remaining vesting period of approximately 2.92 years. We expect the impact of our stock-based compensation expense for restricted stock granted to employees and non-employees to grow in future periods due to the potential increases in the value of our common stock and headcount.

Determination of Fair Value of Common Stock on Grant Dates

We are a private company with no active public market for our common stock. Therefore, we have periodically determined the estimated per share fair value of our common stock at various dates using contemporaneous valuations performed in accordance with the guidance outlined in the American Institute of Certified Public Accountants Practice Aid, *Valuation of Privately-Held Company Equity Securities Issued as Compensation*, also known as the Practice Aid. Once a public trading market for our common stock has been established in connection with the completion of this offering, it will no longer be necessary for us to estimate the fair value of our common stock in connection with our accounting for stock options and restricted stock, as the fair value of our common stock will be its trading price on The NASDAQ Global Market.

For financial reporting purposes, we performed common stock valuations, with the assistance of a third-party valuation specialist, as of January 9, 2014, August 5, 2014, December 31, 2014 and February 11, 2015, which resulted in valuations of our common stock of $0.12, $0.26, $0.27 and $1.05 per share, respectively, as of those dates. In conducting the valuations, we considered all objective and subjective factors that we believed to be relevant for each valuation conducted, including our best estimate of our business condition, prospects and operating performance at each valuation date. Within the valuations performed, a range of factors, assumptions and methodologies were used. The significant factors included:

- the lack of an active public market for our common and our convertible preferred stock;

- the prices of shares of our convertible preferred stock that we had sold to outside investors in arm's length transactions, and the rights, preferences and privileges of that convertible preferred stock relative to our common stock;
- our results of operations, financial position and the status of our research and preclinical development efforts;
- the material risks related to our business;
- our business strategy;
- the market performance of publicly traded companies in the life sciences and biotechnology sectors;
- the likelihood of achieving a liquidity event for the holders of our common stock, such as an initial public offering given prevailing market conditions; and
- any recent contemporaneous valuations of our common stock prepared in accordance with methodologies outlined in the Practice Aid.

There are significant judgments and estimates inherent in the determination of the fair value of our common stock. These judgments and estimates include assumptions regarding our future operating performance, the time to completing an initial public offering, or IPO, or other liquidity event, the related company valuations associated with such events, and the determinations of the appropriate valuation methods. If we had made different assumptions, our stock-based compensation expense, net loss and net loss per share applicable to common stockholders could have been significantly different.

Common Stock Valuation Methodologies

Our retrospective valuations were prepared in accordance with the guidelines in the Practice Aid, which prescribes several valuation approaches for determining the value of an enterprise, such as the cost, market and income approaches, and various methodologies for allocating the value of an enterprise to its capital structure and specifically the common stock.

Our common stock valuations as of January 9, 2014, August 5, 2014 and December 31, 2014 were prepared using the back-solve method of the option-pricing method, or OPM, which derives the implied equity value for one type of equity security from a contemporaneous transaction involving another type of security.

Our common stock valuation as of February 11, 2015 was prepared using the hybrid method. The hybrid method is a hybrid between the probability-weighted expected return method, or PWERM, and OPM, estimating the probability-weighted value across multiple scenarios using the OPM to allocated equity value within at least one of those scenarios. Our hybrid model included an OPM scenario and two IPO scenarios with different dates for completion of the IPO.

Methods Used to Allocate Our Enterprise Value to Classes of Securities. In accordance with the Practice Aid, we considered the various methods for allocating the enterprise value across our classes and series of capital stock to determine the fair value of our common stock at each valuation date. The methods we considered consisted of the following:

OPM. The OPM treats common stock and convertible preferred stock as call options on the total equity value of a company, with exercise prices based on the value thresholds at which the allocation among the various holders of a company's securities changes. Under this method, the common stock has value only if the funds available for distribution to stockholders exceed the value of the liquidation preferences at the time of a liquidity event, such as a strategic sale or merger. The common stock is modeled as a call option on the underlying equity value at a predetermined exercise price. In this model, the exercise price is based on a comparison with the total equity value rather than, as in the case of a regular call option, a comparison with a per share stock price. Thus, common stock is

considered to be a call option with a claim on the enterprise at an exercise price equal to the remaining value immediately after the convertible preferred stock liquidation preference is paid.

The OPM uses the Black-Scholes option-pricing model to price the call options. This model defines the securities' fair values as functions of the current fair value of a company and uses assumptions, such as the anticipated timing of a potential liquidity event and the estimated volatility of the equity securities.

The OPM back-solve approach was used to estimate enterprise value under the OPM. The OPM back-solve approach uses the OPM to derive the implied equity value for one type of equity security from a contemporaneous sale transaction involving another type of our equity securities. In the OPM, the assumed volatility factor was based on the historical trading volatility of our publicly traded peer companies. At each valuation date, a determination was made by us as to the appropriate volatility to be used, considering such factors as the expected time to a liquidity event and our stage of development.

To derive the fair value of the common stock using the OPM, the proceeds to the common stockholders were calculated based on the preferences and priorities of the convertible preferred stock and common stock. We then applied a discount for lack of marketability to the common stock to account for the lack of access to an active public market.

PWERM. Under the PWERM methodology, the fair value of our common stock is estimated based upon an analysis of future values for our company, assuming various outcomes. The common stock value is based on the probability-weighted present value of expected future investment returns considering each of the possible outcomes available as well as the rights of each class of stock. The future value of the common stock under each outcome is discounted back to the valuation date at an appropriate risk-adjusted discount rate and probability weighted to arrive at an indication of value for the common stock.

Hybrid Method. The hybrid method is a PWERM where the equity value in one of the scenarios is calculated using an OPM. In the hybrid method used by us, two types of future-event scenarios were considered: an IPO and an unspecified liquidity event. The enterprise value for the IPO scenario was determined using the guideline public company, or GPC, method under the market approach. The enterprise value for the unspecified liquidity event scenario was determined using the GPC method or the OPM backsolve method. The relative probability of each type of future-event scenario was determined based on an analysis of market conditions at the time, including then-current IPO valuations of similarly situated companies, and expectations as to the timing and likely prospects of the future-event scenarios.

In our application of the GPC method, we considered publicly traded companies in the biopharmaceutical industry that recently completed IPOs as indicators of our estimated future value in an IPO. That future value was discounted back to the valuation date at an appropriate risk-adjusted discount rate. We applied a discount for lack of marketability to the common stock to account for the lack of access to an active public market.

Results of Operations

Comparison of Three Months Ended March 31, 2014 and 2015

The following table summarizes our results of operations for the three months ended March 31, 2014 and 2015, together with the changes in those items in dollars (in thousands):

	Three Months Ended March 31,		
	2014	2015	Dollar Change
	(unaudited)		
Collaboration revenue	$ —	$ 2,576	$ 2,576
Operating expenses:			
Research and development	1,432	5,523	4,091
General and administrative	1,553	1,881	328
Total operating expenses	2,985	7,404	4,419
Other expense, net:			
Other financing expense	(65)	(9,750)	(9,685)
Interest income (expense), net	(2)	1	3
Total other expense, net	(67)	(9,749)	(9,682)
Net loss	$ (3,052)	$ (14,577)	$ (11,525)

Revenue

Revenue was $2.6 million for the three months ended March 31, 2015 related to the upfront payment we received from the Genzyme Collaboration. We did not earn any revenue for the three months ended March 31, 2014. In the three months ended March 31, 2015 we recorded $2.6 million in recognition of amounts allocated to research and development services for various programs under the Genzyme Collaboration, which was entered into in February 2015. Generally, the amounts allocated to these programs are expected to be recognized on a straight line basis over the period the obligations are fulfilled for each program.

Research and Development Expense

Research and development expense increased by $4.1 million from $1.4 million for the three months ended March 31, 2014 to $5.5 million for the three months ended March 31, 2015. The following table summarizes our research and development expenses, for the three months ended March 31, 2015 and March 31, 2014 (in thousands):

	Three Months Ended March 31,		
	2014	2015	Dollar Change
	(unaudited)		
Employee and contractor related expenses	$ 898	$ 1,674	$ 776
Process and platform development expenses	163	3,328	3,165
License fees	322	105	(217)
Facility expenses	20	310	290
Other expenses	29	106	77
Total research and development expenses	$ 1,432	$ 5,523	$ 4,091

The increase in research and development expense was primarily attributable to the following:

- approximately $3.2 million for increased costs of funding research performed by third parties that conduct research and development, preclinical and clinical activities and manufacturing and production design on our behalf, including approximately $1.0 million in expense attributable to in-kind research and development services provided to us under the Genzyme Collaboration, as well as purchases of lab supplies and non-capital equipment used in designing, developing, and manufacturing preclinical study materials;

- approximately $1.1 million for increased research and development employee compensation costs, which were partially offset by a $0.3 million decrease in contractor and consulting fees and expenses;

- approximately $0.3 million for increases in facility costs including rent, depreciation, and maintenance expenses; and

- a decrease of approximately $0.2 million related to lower licensing costs.

General and Administrative Expense

General and administrative expense increased by $0.3 million from $1.6 million for the three months ended March 31, 2014 to $1.9 million for three months ended March 31, 2015. The increase in general and administrative expense was primarily attributable to the following:

- approximately $0.4 million for increased consulting and professional services;

- approximately $0.2 million related to the increase in administrative function headcount;

- approximately $0.2 million for costs related to renting and operating our corporate offices; and

- these expenses were partially offset by an approximately $0.5 million decrease in the patent related legal fees.

Other Expense, Net

Other expense increased by $9.7 million to $9.8 million for the three months ended March 31, 2015 from $0.1 million for the three months ended March 31, 2014. The increase in expense primarily related to the mark to market adjustments recorded on our Series A Preferred Stock Tranche Right liability during the three months ended March 31, 2015. The increase in value of the Tranche Right liability was a result of the increase in the fair value of our Series A Preferred Stock and the increase in the probability of closing the tranche during the three months ended March 31, 2015.

Comparison of Period and Year Ended December 31, 2013 and 2014

The following table summarizes our results of operations for the period ended December 31, 2013 and the year ended December 31, 2014, respectively, together with the changes in those items in dollars (in thousands):

	Period from June 19, 2013 (inception) to December 31, 2013	Year Ended December 31, 2014	Dollar Change
Collaboration revenue	$ —	$ —	$ —
Operating expenses:			
Research and development	2,316	8,898	6,582
General and administrative	1,450	5,469	4,019
Total operating expenses	3,766	14,367	10,601
Other expense, net:			
Other financing expense	—	(1,949)	(1,949)
Interest expense, net	(67)	(1)	66
Total other expense, net	(67)	(1,950)	(1,883)
Net loss	$ (3,833)	$ (16,317)	$ (12,484)

Revenue

During the period and year ended December 31, 2013 and 2014, respectively, we did not earn any revenue from product sales or from collaboration agreements.

Research and Development Expense

Research and development expense increased by $6.6 million from $2.3 million for the period ended December 31, 2013 to $8.9 million for the year ended December 31, 2014. The following table summarizes our research and development expenses, for the year and period ended December 31, 2014 and December 31, 2013, respectively (in thousands):

	Period from June 19, 2013 (inception) to December 31, 2013	Year Ended December 31, 2014	Dollar Change
Employee and contractor related expenses	$ 2,152	$ 4,319	$ 2,167
Process and platform development expenses	31	2,842	2,811
License fees	—	872	872
Facility expenses	—	554	554
Other expenses	133	311	178
Total research and development expenses	$ 2,316	$ 8,898	$ 6,582

The increase in research and development expense was primarily attributable to research and development, and included the following:

- approximately $2.8 million for increased purchases of lab supplies and non-capital equipment, funding preclinical and research development efforts and process development and design costs;

- approximately $2.2 million for increased compensation expenses, of which $2.6 million related to increased employee compensation costs, including hiring of personnel during 2014, which were partially offset by a $0.4 million decrease in contractor and consulting fees;

- approximately $0.9 million related to acquiring patents and licensing rights; and

- approximately $0.6 million for increases in facility costs including rent, depreciation, and maintenance expenses;

General and Administrative Expense

General and administrative expense increased by $4.0 million from $1.5 million for the period ended December 31, 2013 to $5.5 million for the year ended December 31, 2014. The increase in general and administrative expense was primarily attributable to 12 months of operations being included in 2014 versus the six months of operations during 2013 and included the following:

- approximately $1.5 million for patent-related and other corporate legal fees incurred during 2014;

- approximately $1.0 million for increased employee compensation costs, including hiring of personnel during 2014;

- approximately $0.6 million for renting and operating our corporate facilities; and

- approximately $0.5 million for administrative consulting and professional services.

Other Expense, Net

Other expense increased by $1.9 million to $2.0 million for the year ended December 31, 2014 from $0.1 million for the period ended December 31, 2013. The increase in expense primarily related to the mark to market adjustments recorded on our Series A Preferred Stock Tranche Right liability during 2014. Additionally, interest expense decreased by $0.1 million for the year ended December 31, 2014 from $0.1 million for the period ended December 31, 2013. The decrease related to the exchange of the convertible promissory notes payable, which were issued during the period ended December 31, 2013, into Series A Preferred Stock in January 2014.

Liquidity and Capital Resources

Sources of Liquidity

We have funded our operations primarily through proceeds from private placements of our convertible preferred stock of $75.0 million and proceeds associated with an up-front payment from the Genzyme Collaboration of $65.0 million. As of March 31, 2015, we had cash and cash equivalents of $116.4 million.

Cash Flows

The following table provides information regarding our cash flows for the period and year ended December 31, 2013 and 2014 and the three months ended March 31, 2014 and March 31, 2015 (in thousands):

	Period from June 19, 2013 (Inception) to December 31, 2013	Year Ended December 31, 2014	Three Months Ended March 31,	
			2014	2015
			(unaudited)	
Net cash provided by (used in):				
Operating activities	$ (2,725)	$ (11,918)	$ (2,534)	$ 64,588
Investing activities	—	(3,302)	(185)	(150)
Financing activities	2,860	22,120	3,554	44,941
Net increase in cash and cash equivalents	$ 135	$ 6,900	$ 835	$ 109,379

Net Cash Provided by (Used in) Operating Activities

The use of cash in all periods resulted primarily from our net losses adjusted for non-cash charges and changes in components of working capital.

Net cash provided by operating activities was $64.6 million during the three months ended March 31, 2015 compared to $2.5 million of cash used in operating activities during the three months ended March 31, 2014. The increase in cash provided by operating activities was primarily due to the receipt of the $65.0 million upfront payment from Genzyme under the Genzyme Collaboration.

Net cash used in operating activities was $11.9 million during the year ended December 31, 2014 compared to $2.7 million during the period ended December 31, 2013. The increase in cash used in operating activities was due to an increase in net loss of $12.5 million for the year ended December 31, 2014 as compared to the period ended December 31, 2013.

Net Cash Used in Investing Activities

Net cash used in investing activities was $0.2 million during the three months ended March 31, 2015 compared to $0.2 million during the three months ended March 31, 2014. The cash used for investing activities was primarily due to purchases of fixed assets in both periods.

Net cash used in investing activities was $3.3 million during the year ended December 31, 2014. We did not use any cash in investing activities during the period ended December 31, 2013. The increase in cash used in investing activities was due to purchases of property and equipment of $1.7 million, the build-out of our leased facilities under the tenant improvements allowance of $1.3 million, and setting aside $0.3 million in restricted cash as required by our lease agreement and credit card agreements.

Net Cash Provided by Financing Activities

Net cash provided by financing activities was $44.9 million during the three months ended March 31, 2015 compared to $3.6 million during the three months ended March 31, 2014. The increase in cash provided by financing activities was primarily due to the issuance of $20.0 million of Series A Preferred Stock and $30.0 million of Series B Preferred Stock, of which $5.0 million in proceeds were in excess of the Series B Preferred Stock's fair value and were allocated to deferred revenue.

Net cash provided by financing activities was $22.1 million during the year ended December 31, 2014 compared to $2.9 million during the period ended December 31, 2013. The increase in cash

provided by financing activities was primarily due to the closing of the first four Series A Preferred Stock financing rounds for aggregate gross proceeds of $22.0 million during 2014.

Funding Requirements

We expect our expenses to increase in connection with our ongoing activities, particularly as we continue the research and development of, continue or initiate clinical trials of, and seek marketing approval for, our product candidates. In addition, if we obtain marketing approval for any of our program candidates, we expect to incur significant commercialization expenses related to program sales, marketing, manufacturing and distribution to the extent that such sales, marketing and distribution are not the responsibility of potential collaborators. Furthermore, upon the completion of this offering, we expect to incur additional costs associated with operating as a public company. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we would be forced to delay, reduce or eliminate our research and development programs or future commercialization efforts.

We expect our existing cash and cash equivalents will enable us to fund our operating expenses and capital expenditure requirements for at least the next 24 months. Our future capital requirements will depend on many factors, including:

- the scope, progress, results and costs of product discovery, preclinical studies and clinical trials for our product candidates;
- the scope, prioritization and number of our research and development programs;
- the costs, timing and outcome of regulatory review of our product candidates;
- our ability to establish and maintain collaborations on favorable terms, if at all;
- the achievement of milestones or occurrence of other developments that trigger payments under the Genzyme Collaboration and any other collaboration agreements we obtain;
- the ability of our collaboration partners to exercise options to extend research and development programs
- the extent to which we are obligated to reimburse, or entitled to reimbursement of, clinical trial costs under collaboration agreements, if any;
- the costs of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending intellectual property-related claims;
- the extent to which we acquire or in-license other product candidates and technologies;
- the costs of securing manufacturing arrangements for commercial production; and
- the costs of establishing or contracting for sales and marketing capabilities if we obtain regulatory approvals to market our product candidates.

Identifying potential product candidates and conducting preclinical studies and clinical trials is a time-consuming, expensive and uncertain process that takes many years to complete, and we may never generate the necessary data or results required to obtain marketing approval and achieve product sales. In addition, our product candidates, if approved, may not achieve commercial success. Our commercial revenues, if any, will be derived from sales of gene therapies that we do not expect to be commercially available for many years, if at all. Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. Adequate additional financing may not be available to us on acceptable terms, or at all.

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, debt financings, collaborations, strategic alliances and licensing arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. 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.

If we raise funds through additional collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research 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 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.

Contractual Obligations

The following table summarizes our significant contractual obligations as of payment due date by period at December 31, 2014 (in thousands):

	Total	Less Than 1 Year	1 to 3 Years	3 to 5 Years	More than 5 Years
Operating lease commitments[(1)]	$ 5,877	$ 1,117	$ 3,576	$ 1,184	$ —

(1) We lease office space at 75 Sidney Street in Cambridge, Massachusetts under a non-cancelable operating lease that expires in December 2019.

We enter into agreements in the normal course of business with CROs and institutions to license intellectual property. We have not included these future payments in the table of contractual obligations above since the contracts are cancelable at any time by us, generally upon 30 to 90 days prior written notice.

Our agreements to license intellectual property include potential milestone payments that are dependent upon the development of products using the intellectual property licensed under the agreements and contingent upon the achievement of clinical trial or regulatory approval milestones. The maximum aggregate potential milestone payments payable by us total approximately $12.0 million. Additionally, under the terms of one agreement, we have options to license intellectual property to be used in the development of therapies for four disease indications. If we exercise all of the options under the agreement, we would be obligated to pay aggregate up-front fees of up to approximately $1.5 million and milestone payments that are contingent upon clinical trial results and regulatory approval of $5.0 million per disease indication, or up to $20.0 million in total. We may also be required to pay to annual maintenance fees or minimum amounts payable ranging from low-four digits to low five-digits depending upon the terms of the applicable agreement.

Off-Balance Sheet Arrangements

We did not have, during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined under applicable Securities and Exchange Commission rules.

Quantitative and Qualitative Disclosures About Market Risk

We are exposed to market risk related to changes in interest rates. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest

rates, particularly because our investments, including cash and cash equivalents, are in a money market fund that invests in U.S. Treasury obligations.

We are not currently exposed to market risk related to changes in foreign currency exchange rates; however, we may contract with vendors that are located in Asia and Europe in the future and may be subject to fluctuations in foreign currency rates at that time.

Inflation generally affects us by increasing our cost of labor and clinical trial costs. We do not believe that inflation had a material effect on our business, financial condition or results of operations during the period and year ended December 31, 2013 and 2014 and the three months ended March 31, 2014 and March 31, 2015, respectively.

JOBS Act

In April 2012, the JOBS Act, was enacted. Section 107 of the JOBS Act provides that an EGC can take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act of 1933, as amended, or the Securities Act, for complying with new or revised accounting standards. Thus, an EGC can delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this extended transition period and, as a result, we will adopt new or revised accounting standards on the relevant dates on which adoption of such standards is required for other public companies.

We are in the process of evaluating the benefits of relying on other exemptions and reduced reporting requirements under the JOBS Act. Subject to certain conditions, as an EGC, we intend to rely on certain of these exemptions, including without limitation, (i) providing an auditor's attestation report on our system of internal controls over financial reporting pursuant to Section 404(b) of the Sarbanes-Oxley Act and (ii) complying with any requirement that may be adopted by the Public Company Accounting Oversight Board, or PCAOB, regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements, known as the auditor discussion and analysis. We will remain an EGC until the earlier of (i) the last day of the fiscal year in which we have total annual gross revenues of $1.0 billion or more; (ii) the last day of the fiscal year following the fifth anniversary of the date of the completion of this offering; (iii) the date on which we have issued more than $1.0 billion in nonconvertible debt during the previous three years; or (iv) the date on which we are deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission.

BUSINESS

Overview

We are a clinical-stage gene therapy company focused on developing life-changing treatments for patients suffering from severe diseases of the central nervous system, or CNS. We focus on CNS diseases where we believe that an adeno-associated virus, or AAV, gene therapy approach that either increases or decreases the production of a specific protein can slow or reduce the symptoms experienced by patients, and therefore have a clinically meaningful impact. We have created a product engine that enables us to engineer, optimize, manufacture and deliver our AAV-based therapies that have the potential to provide durable efficacy following a single administration directly to the CNS. Our product engine has rapidly generated programs for five CNS indications, including advanced Parkinson's disease; a monogenic form of amyotrophic lateral sclerosis, or a form of the disease caused by a single gene mutation; Friedreich's ataxia; Huntington's disease; and spinal muscular atrophy. Our most advanced clinical candidate, VY-AADC01, is being evaluated for the treatment of advanced Parkinson's disease in an open-label, Phase 1b clinical trial with the goal of generating human proof-of-concept data in the second half of 2016. Our founders and members of our management team have extensive experience in drug discovery and development and have pioneered significant advances within the fields of AAV gene therapy and neuroscience.

We believe that AAV gene therapy is a particularly attractive treatment approach for CNS diseases that are caused by well-defined genetic mutations. CNS diseases are a leading driver of global disease burden and represent the single largest biopharmaceutical market with estimated worldwide annual sales of over $125 billion in 2013; with the five CNS indications that we are currently targeting representing only a portion of this market. Due to the limited treatment options available for many CNS diseases; there remains a significant unmet medical need and an opportunity for AAV gene therapy to transform the lives of many patients with severe CNS diseases. Based upon clinical data generated to date, we believe that durable gene expression is achievable following a single administration of AAV gene therapy. Recent advances in delivery techniques allow for targeted delivery of AAV vectors, which are modified, non-replicating versions of AAV, to discrete regions of the CNS. In addition, AAV is believed to be safe, as no vector-related serious adverse events, or SAEs, have been reported in the more than 1,300 patients, indications, that we estimate have been treated with AAV gene therapy to date, including 200 patients treated for CNS indications.

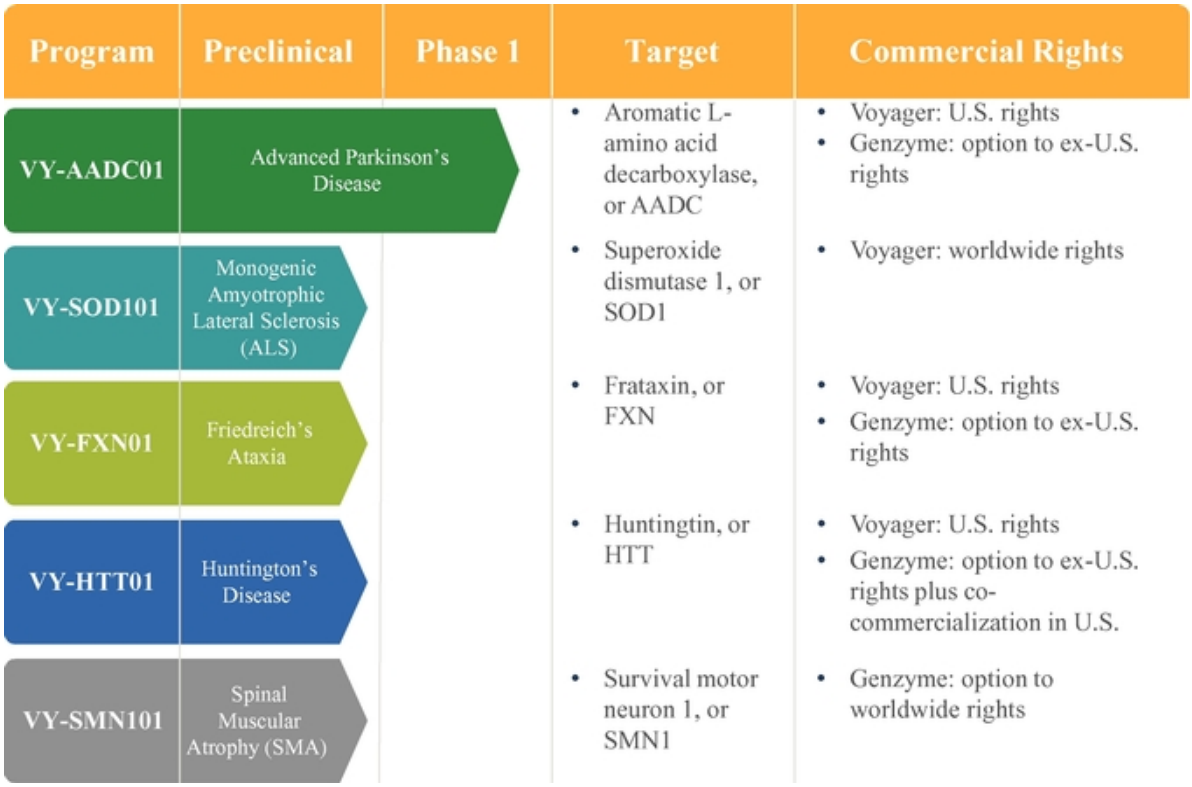
We have built a product engine that we believe positions us to be the leading company at the intersection of AAV gene therapy and severe CNS diseases. Our team of experts in the fields of AAV gene therapy and neuroscience first identifies and selects severe CNS diseases that are well-suited for treatment using AAV gene therapy. We then engineer and optimize AAV vectors for delivery to the targeted tissue or cells. Our manufacturing process employs an established system to enable production of high quality AAV vectors at commercial-scale. Finally, we leverage established routes of administration and advances in dosing techniques to optimize delivery of our AAV gene therapies directly to discrete regions of the brain or more broadly to the spinal cord region.

Our most advanced clinical candidate, VY-AADC01, is being evaluated for the treatment of advanced Parkinson's disease. The overall goal of treatment with VY-AADC01 is to restore advanced Parkinson's disease patients' responsiveness to levodopa, or L-Dopa, the longtime standard of care for controlling patients' symptoms at early stages of the disease. Human proof-of-concept data is being generated for VY-AADC01 in an open-label, Phase 1b clinical trial being conducted by our collaborators at the University of California, San Francisco, or UCSF. The main goals of this dose-escalation trial are to optimize vector delivery and dose, as well as to obtain further information on the safety profile of the treatment. Dosing has been completed for the first cohort of five patients and no SAEs have been observed to date. The first patient in the second cohort was treated in June 2015.

Our four preclinical programs target severe CNS indications where loss or abnormal expression of a specific gene has been identified as the cause of the disease. Furthermore, based on preclinical data, we believe that we can successfully deliver the target gene to the appropriate tissue and cells in the CNS in order to increase or decrease expression of the target protein, as required for therapeutic efficacy. Several of our product candidates may be eligible for orphan drug designation or breakthrough therapy designation.

In February 2015, we entered into a strategic collaboration with Genzyme Corporation, a Sanofi company, or Genzyme, to leverage our combined expertise and assets to develop AAV gene therapies for severe CNS diseases. Under the agreement, we received $65.0 million in upfront cash, a $30.0 million upfront equity investment and an in-kind commitment of $5.0 million, totalling $100 million. Additionally, we are eligible to receive up to $745 million in option and milestone payments while retaining U.S. commercial rights to most programs.

Our pipeline of AAV gene therapy programs is summarized in the table below:



Mission and Strategy

Our mission is to become the world leader in AAV gene therapy for treating severe CNS diseases by developing transformative therapies. Our strategy to achieve this mission is to:

- ***Continually invest in our AAV product engine.*** We intend to further develop and enhance our product engine by focusing on (i) vector engineering and optimization; (ii) manufacturing; and (iii) dosing and delivery techniques. We plan to continue generating novel AAV vectors by engineering and optimizing vectors best suited to a targeted disease. We are building an onsite, state-of-the-art process research and development facility to enable the manufacturing of high quality AAV gene therapies. We expect to utilize established and novel techniques for dosing

and delivery of our AAV gene therapies to the CNS. We plan to continually invest in our product engine to maintain our leadership in AAV gene therapy for CNS diseases.

- ***Establish a leadership position in commercial-scale, high quality AAV manufacturing.*** We believe that manufacturing capacity and expertise are critical to successfully treating patients using gene therapy, and we are committed to building a system with commercial capacity. Through our collaboration with MassBiologics, a U.S. Food and Drug Administration, or FDA, licensed manufacturer affiliated with the University of Massachusetts Medical School, we are establishing a commercial-scale current good manufacturing practice, or cGMP, compliant manufacturing capability. We believe that we will have a cGMP manufacturing capability by early 2016. We are using the baculovirus AAV production system, a system for manufacturing AAV vectors that uses viruses from the baculoviridae family, originally invented and developed by several members of our current production team while at the National Institutes of Health, or NIH, which we continue to improve upon. We believe that having oversight over our own commercial manufacturing process is critical to ensuring quality product with commercial yields.

- ***Optimize and advance VY-AADC01 for the treatment of advanced Parkinson's disease.*** Human proof-of-concept data is being generated for VY-AADC01 in an open-label, Phase 1b dose-escalation trial being conducted by our collaborators at UCSF. The main goals of this trial are to optimize vector delivery and dosing, as well as to obtain further information on the safety profile of the treatment. More specifically, we are seeking to identify the infusion volume required to achieve effective coverage of the putamen, particularly the posterior putamen, the targeted region within the brain. Once we optimize for coverage, we expect to escalate the dose of VY-AADC01 to optimize for clinical benefit. Dosing of the first cohort of five patients in the ongoing Phase 1b trial has been completed and no SAEs have been observed to date. The first patient in the second cohort was treated in June 2015. In the second cohort, we have increased the infusion volume to improve the coverage level achieved.

- ***Continue to build a pipeline of gene therapy programs focused on severe CNS diseases.*** Beyond our clinical-stage program for advanced Parkinson's disease, we have a deep and promising pipeline of AAV gene therapy programs in various stages of preclinical development. Our goal is to add at least one new pipeline program in early 2016 and submit our next Investigational New Drug Application, or IND, in 2017. We believe that our leadership position in AAV gene therapy for CNS diseases and our product engine provide us with the necessary capabilities to evaluate and capitalize on external opportunities. As such, we plan to opportunistically expand our pipeline through acquisition, in-licensing or other strategic transactions.

- ***Maintain and maximize the value of our commercialization rights.*** Under our collaboration with Genzyme, we have retained significant commercialization rights. As we advance clinical development of our product candidates and programs, we expect to continue to explore value-maximizing avenues, including building our own sales and marketing infrastructure or partnering with third parties, for commercialization.

- ***Continue to expand our intellectual property portfolio.*** We seek to have an industry leading intellectual property portfolio. To that end, we seek patent rights for various aspects of our programs, including vector engineering and construct design, our production process, and all features of our clinical products including compositions and methods of delivery. We expect to continue to expand our intellectual property portfolio by aggressively seeking patent rights for promising aspects of our product engine and product candidates.

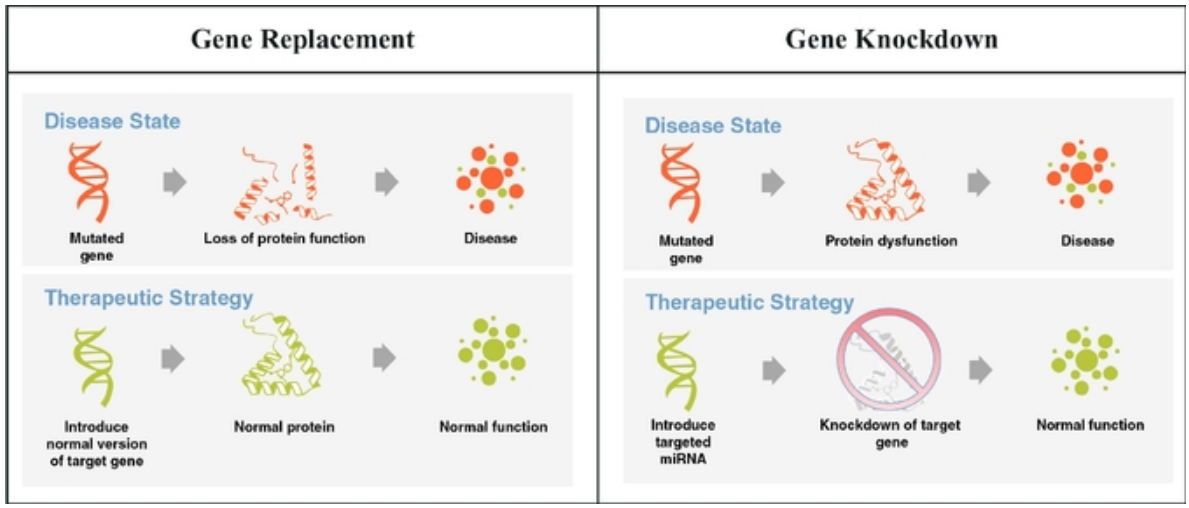
AAV Gene Therapy for CNS Diseases

Gene therapy is an approach whereby gene expression is directly altered in patients to address the underlying cause or predominant manifestations of disease. We believe that the targeted nature of gene

therapy may enable powerful treatment options, and provide these patients with meaningful and durable benefits.

While AAV gene therapy can potentially be harnessed for multiple treatment methods, we are currently focused on gene replacement and gene knockdown approaches. Gene replacement is intended to restore the expression of a protein that is not expressed, expressed at abnormally low levels or functionally mutated with loss of function. Gene knockdown is intended to reduce the expression of a pathologically mutated protein that has detrimental effects.

Overview of AAV-Based Therapeutic Methods Currently Being Pursued by Voyager



Our gene therapy approach uses AAV vectors which we believe are ideal vectors for gene therapy for several reasons:

- **Broad Applicability.** AAV is able to transduce, or transfer a therapeutic gene, into numerous cell types including target cells in the CNS.
- **Safety.** AAV is believed to be safe and is not known to cause any disease in humans. No vector-related SAEs have been reported in the more than 1,300 patients, including over 200 patients for CNS indications, treated with AAV gene therapy to date.
- **Does Not Readily Integrate.** AAV does not readily integrate into the genome of the target cell, reducing the potential for oncogenesis, or the induction of cancer.

There are several important reasons why we believe that CNS diseases are well-suited for treatment with AAV gene therapy, including the following:

- **Validated Targets.** Many CNS diseases are caused by well-defined mutations in genes and these genes represent genetically validated drug targets for AAV gene therapy.
- **Targeted Delivery.** Advances in delivery techniques allow for direct delivery of AAV vectors to discrete regions in the brain or broader delivery throughout the spinal cord via the cerebrospinal fluid, or CSF.
- **Durable Expression.** Long-term gene expression may be achievable in the CNS following one-time dosing and transfer of the therapeutic gene with an AAV vector. Cells in the CNS are terminally differentiated, or no longer divide, eliminating the potential for cell division to dilute expression of the therapeutic gene. Repeated or continual dosing with direct injection of drugs into the CNS is complex, therefore a one-time AAV gene therapy has significant advantages.
- **Immune Privileged Site.** There is a reduced risk of harmful immune response due to localized delivery in a self-contained system.

While we are currently focused on gene replacement and gene knockdown approaches, we are also actively exploring additional potential treatment methods that can utilize an AAV vector, including the direct delivery of monoclonal antibodies to the CNS, as well as gene editing to correct or delete a gene in the cell genome.

The Voyager Product Engine

We have built a product engine that we believe positions us to be the leading company at the intersection of AAV gene therapy and severe CNS diseases. Our team of experts in the fields of AAV gene therapy and neuroscience first identifies and selects severe CNS diseases that are well-suited for treatment using AAV gene therapy. We then apply our expertise in AAV vector engineering and optimization, process research and development, manufacturing, dosing and direct CNS delivery to generate a specific AAV gene therapy for a target disease. We believe that optimizing each of these parameters is a key factor for overall program success. We expect that our current and future pipeline programs will make use of technological advances generated with our product engine.

Disease Selection

We assess potential product programs based upon the following criteria:

- **Unmet Need.** There is a significant unmet medical need for the indication and substantial commercial potential.
- **Target Validation.** There is strong evidence that expression of a specific gene, or lack thereof, is causing, or critical to, the disease state.
- **Delivery Using AAV.** There is strong evidence supporting the ability to target the relevant tissue and cells using an AAV vector to achieve sufficient target gene expression.
- **Clinical Readouts.** The clinical impact of an AAV gene therapy can be clearly measured, including through well-accepted clinical endpoints and the use of both existing and novel biomarkers.
- **Scalability of Manufacturing.** Sufficient AAV vector to supply late-stage clinical development and commercialization can be manufactured.

In addition to the criteria above, we also look for groups of diseases where our knowledge can be transferred. For instance, we believe that some of the delivery parameters and imaging techniques that are employed in our VY-AADC01 program can be applied to AAV gene therapy delivery for Huntington's disease or other diseases where direct, targeted delivery to the brain is warranted. Likewise, we anticipate that our programs for a monogenic form of amyotrophic lateral sclerosis, or ALS, Friedreich's ataxia and spinal muscular atrophy, or SMA, will all utilize injection into the CSF within the spinal column to achieve broad transgene expression in and around the spinal cord.

Vector Engineering and Optimization

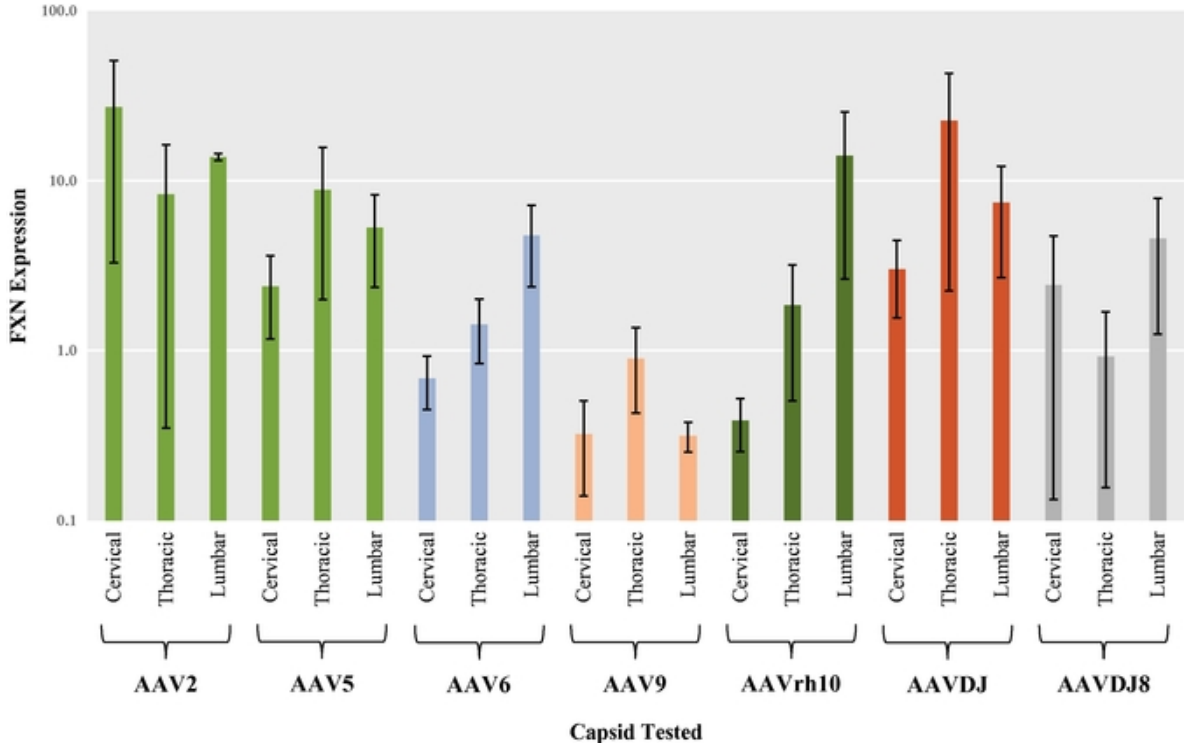
We are engineering and optimizing AAV vectors that we believe are best suited for each of our programs. The key components of an AAV vector include: (i) the capsid, or the outer viral protein shell that encloses the target DNA, which includes the promoter and the therapeutic gene; (ii) the therapeutic gene, or transgene; and (iii) the promoter, or the DNA sequence that drives the expression of the transgene.

Members of our team have co-discovered many of the known naturally occurring AAV capsids and have also created promising genetically engineered AAV capsids. Genetically engineered capsids have yielded vectors with desirable properties, such as higher biological potency and enhanced tissue specificity. We believe that there is an opportunity to further optimize AAV capsids to confer desired

characteristics relating to properties such as tissue specificity and immunogenicity. We have a significant effort dedicated to designing and screening for novel AAV capsids using a number of different scientific approaches. We believe that the information generated by this work will enhance our ability to rationally design AAV capsids with specific properties for particular therapeutic applications.

We completed a non-human primate study that directly compared transgene expression and distribution in the spinal cord across seven different AAV capsids. The capsids were delivered via injection into the CSF within the spinal column and the specific transgene delivered by all the capsids was FXN. Levels of FXN expression were measured at multiple regions of the spinal cord, including the cervical, thoracic and lumbar regions. As shown in the figure below, meaningful differences in the level and distribution of FXN expression were seen across the AAV capsids that were compared. In this study, the levels of FXN expression were highest with AAV2, AAV5 and AAVDJ, and lowest with AAV9. Additionally, FXN expression was normalized as a fold increase relative to FXN expression in a human brain reference sample. Fold increase is a measure describing how much a quantity increases from a baseline value to a final value. For example, a baseline value of 30 and a final value of 60 corresponds to a fold change of two, or a two-fold increase. Fold increase is used as a reporting measure to emphasize the increase itself as opposed to the absolute values.

Capsid Comparison Study Showed Substantial Differences in Transgene Expression of the Spinal Cord of Non-Human Primates



With respect to the target DNA delivered through AAV gene therapy, we are selecting promoters that we believe have the appropriate activity and tissue selectively for our specific gene therapy programs. We are also designing transgenes to provide optimal expression once delivered to the targeted cells.

Manufacturing at Commercial Quality and Scale

The ability to produce high quality AAV vectors at commercial-scale is a critical success factor in AAV gene therapy. While at the NIH, Robert Kotin, Ph.D., our Vice President of Production, and other members of our current production team invented and developed a baculovirus AAV production system, which we use and have continued to improve. This system has a number of attributes that enable high quality commercial-scale manufacturing, including:

- **High Yield.** A single manufacturing run at 500-liter scale can yield many thousands of doses of an AAV gene therapy.
- **High Purity.** A relatively high percentage of AAV vectors contain the therapeutic DNA, reducing the number of empty capsids compared to alternative manufacturing approaches. In addition, the baculovirus system eliminates the risk of introducing mammalian cell derived impurities.
- **Scalability.** This process is reproducible at volumes ranging from 0.02 liters to 500 liters.
- **Promising Regulatory Framework.** AAV gene therapy products manufactured with the baculovirus system include Glybera, the only approved AAV gene therapy product in the Western world, and the marketed vaccines Flublok and Cervarix.

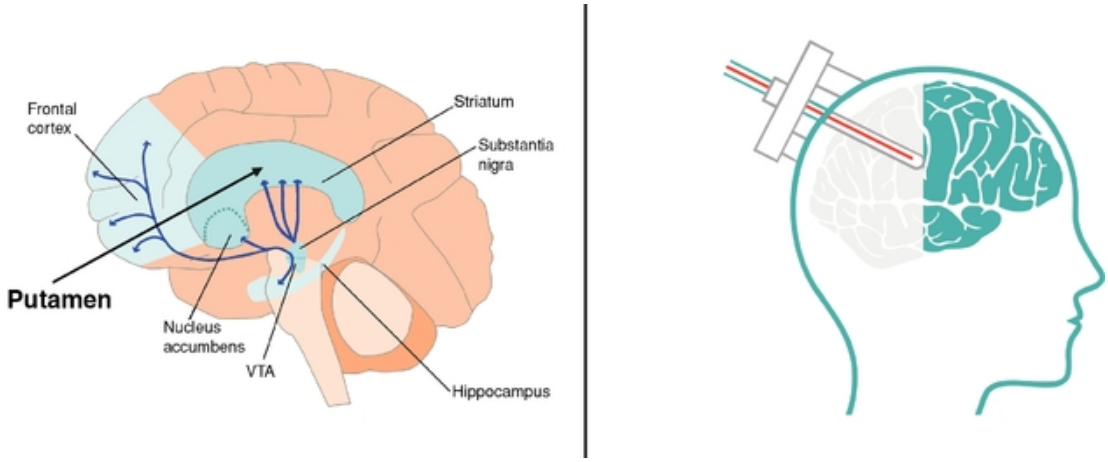
We are building a state-of-the-art process research and development production facility for manufacturing research-grade AAV vectors onsite at our Cambridge, Massachusetts headquarters and a cGMP, commercial-scale AAV manufacturing capability through our collaboration with MassBiologics, in Fall River, Massachusetts, both of which will employ our baculovirus production system.

Optimized Delivery and Route of Administration

Identifying the optimal route of administration and delivery parameters for AAV gene therapy, such as infusion volume, flow rate, vector concentration and dosing and formulation for a specific disease, are critical to achieving safe and effective levels of transgene expression in the targeted location in the CNS. We aim to develop clinically feasible protocols that yield reproducible results across patients. For our current pipeline programs, we are either pursuing direct injection into the brain, called intraparenchymal injection (advanced Parkinson's disease and Huntington's disease) or injection into the CSF within the cerebrospinal space, called intrathecal injection (Friedreich's ataxia, SMA and a monogenic form of ALS).

- **Intraparenchymal Injection to the Brain.** In the development of VY-AADC01 for the treatment of advanced Parkinson's disease, we are using the ClearPoint System to provide real-time, intra-operative, magnetic resonance imaging, or MRI, as well as state-of-the-art infusion technologies. The ClearPoint System can be used to precisely deliver AAV vectors to a targeted region of the brain, the putamen. The surgical approach that we are using is similar to the approach used for deep brain stimulation, or DBS, a marketed device-based treatment for advanced Parkinson's disease. In multiple clinical trials to date, a similar delivery technique was used to successfully deliver AAV gene therapy to the brains of patients with Parkinson's disease. We believe that the delivery knowledge gained from our VY-AADC01 program can be applied to AAV gene therapy delivery for Huntington's disease.

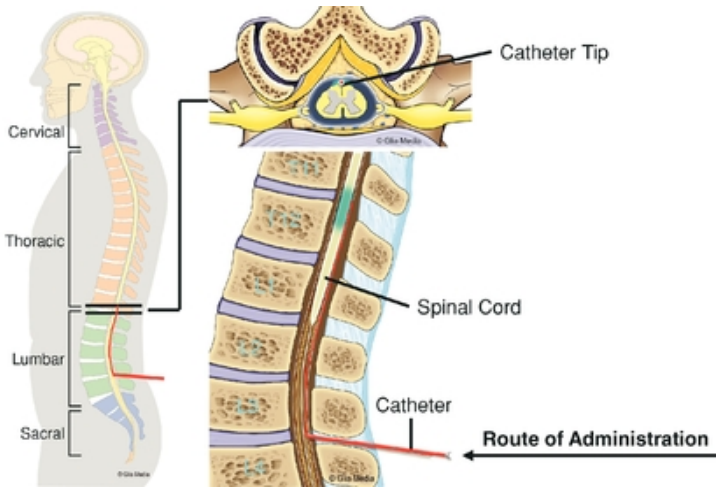
Overview of Intraparenchymal Delivery



Courtesy of: Okinawa Institute of Science and Technology.

- **Intrathecal Injection to the Spinal Cord.** For spinal cord disorders, including monogenic ALS, Friedreich's ataxia and SMA, we believe that intrathecal injection is the optimal route of administration to achieve broad transgene expression throughout the relevant cells in the spinal cord and sensory pathways. Preclinical studies completed by us and others have demonstrated that intrathecal delivery of AAV vectors can effectively transfer the therapeutic genes to relevant cells in all regions of the spinal cord, as well as in the sensory pathways. Currently, intrathecal injection is commonly used for the delivery of various types of medications, including those to treat pain and infections.

Overview of Intrathecal Delivery



Overview of Our Pipeline

We have leveraged our product engine to assemble a pipeline of novel AAV gene therapies for the treatment of severe CNS diseases with high unmet medical need. Depending on the disease, our current AAV gene therapies will use either a gene replacement or gene knockdown approach. Our goal

is to address the underlying cause or the predominant manifestations of a specific disease by significantly increasing or decreasing expression of the relevant proteins at targeted sites within the CNS. Several of our product candidates may be eligible for orphan drug designation or breakthrough therapy designation.

Program	Indication	Target	Method	Route of Administration
VY-AADC01	Advanced Parkinson's Disease	AADC	Gene replacement	Intraparenchymal injection
VY-SOD101	Monogenic ALS	SOD1	Gene knockdown	Intrathecal injection
VY-FXN01	Friedreich's Ataxia	FXN	Gene replacement	Intrathecal injection
VY-HTT01	Huntington's Disease	HTT	Gene knockdown	Intraparenchymal injection (with or without intrathecal injection)
VY-SMN101	SMA	SMN1	Gene replacement	Intrathecal injection

Advanced Parkinson's Disease Program: VY-AADC01

Disease Overview

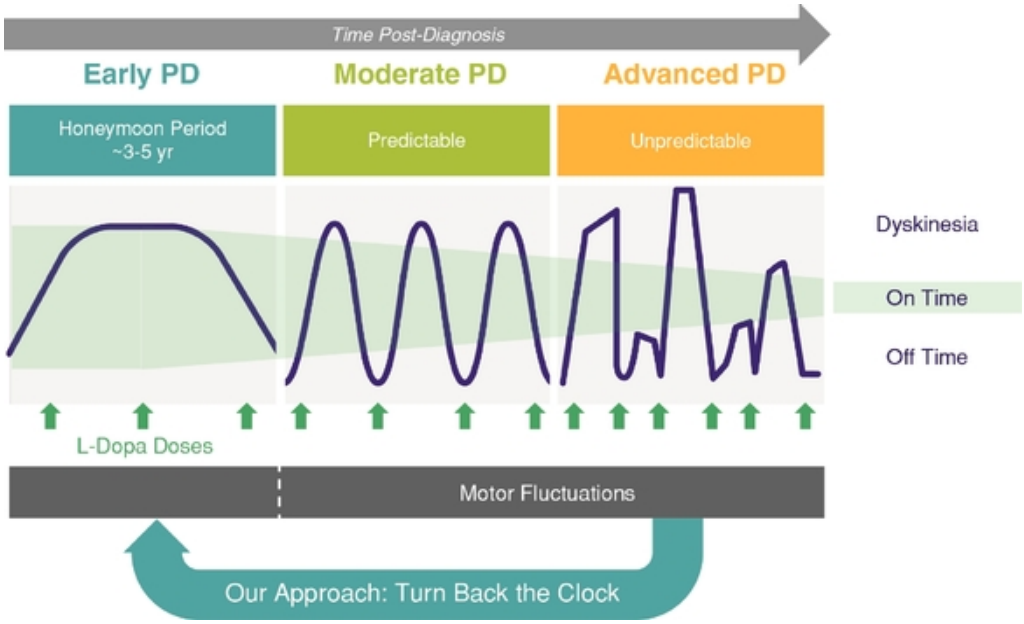
Parkinson's disease is a progressive and debilitating adult-onset neurodegenerative disorder. Individuals who develop the disease are on average over 60 years of age. The cardinal clinical features of Parkinson's disease include bradykinesia, or slow movements, rigidity, rest tremor and loss of balance. While the underlying cause of Parkinson's disease is unknown, the depletion of the neurotransmitter dopamine in the region of the brain called the putamen leads to the debilitating motor symptoms associated with the disease. The prevalence of Parkinson's disease is estimated to be 700,000 patients in the United States and 7 to 10 million patients worldwide according to a 2010 article from *Neuroepidemiology* and the Parkinson's Disease Foundation, respectively. Due to the aging of the population in the developed world, we believe that the prevalence of Parkinson's disease will increase. It is estimated that up to 15% of the prevalent population with Parkinson's disease, or approximately 100,000 patients in the United States, have motor fluctuations that are refractory, or not well-controlled, with L-Dopa, the current mainstay of therapy, and thus may be candidates for gene therapy. These are typically patients who have progressed to an advanced stage of the disease.

The progressive motor symptoms of Parkinson's disease are due to the death of neurons in the substantia nigra region of the brain. Neurons in the substantia nigra express the enzyme aromatic L-amino acid decarboxylase, or AADC, which is responsible for the conversion of L-Dopa into dopamine, and are also responsible for the release of dopamine into the putamen, particularly the posterior putamen, which is a region of the brain that plays a significant role in motor function and control. While Parkinson's disease causes neurons in the substantia nigra to die, the neurons in the putamen remain intact, but do not normally express AADC. We believe that an AAV gene therapy approach that allows for the delivery of AADC directly to the neurons in the putamen, enabling the targeted neurons to convert L-Dopa into dopamine, is an attractive therapeutic strategy for advanced Parkinson's disease.

While symptomatic treatments exist, there are currently no therapies that effectively slow or reverse the progression of Parkinson's disease. The beneficial effects of L-Dopa on the symptoms of Parkinson's disease were discovered over 50 years ago and treatment with L-Dopa remains the standard

of care for patients today. In the first several years after patients' diagnosis, sometimes referred to as the honeymoon period, patients' motor symptoms are generally well-controlled with L-Dopa treatment. However, as the disease progresses, patients become less responsive to L-Dopa. Despite increases in the amount and frequency of dosing of L-Dopa, patients with advanced forms of the disease experience longer periods of reduced mobility, termed off time, when their medication is ineffective, increased episodes of dyskinesias, or involuntary muscle movements, due to too much drug and shorter periods of on time when their medication is effective. These motor fluctuations and increased periods of off time are associated with disability and a dramatically reduced quality of life. As shown in the figure below, on time decreases, while off time and dyskinesias increase as patients progress from the honeymoon period into later stages of Parkinson's disease.

Overview of Progression of Parkinson's Disease (PD)



While L-Dopa and other pharmacological approaches to augmenting dopamine provide symptomatic benefit during early stages of Parkinson's disease, there are relatively limited treatment options for patients with advanced Parkinson's disease. There are two FDA approved therapies used to specifically treat advanced Parkinson's disease patients with medically refractive motor fluctuations. The first, DBS, requires the implantation of an electrical stimulation device in the body, which is connected to electrodes that are placed into the brain. The second, marketed as DUODOPA in Europe and DUOPA in the United States, requires the surgical placement of a tube into the intestine so that medication is delivered by a pump that resides outside the body, which patients must carry with them.

Only a relatively small portion of eligible Parkinson's disease patients receive DBS or DUODOPA/DUOPA. In 2014, we estimate that only approximately 6,000 patients worldwide received DBS and approximately 3,500 patients in Europe received DUODOPA/DUOPA. DUOPA received FDA approval in early 2015. We believe that the need for indwelling hardware and the maintenance associated with each of these approaches are significant deterrents for many potential patients. Given the size of the addressable patient population with advanced Parkinson's disease and the limitations of the currently available treatment options for these patients, we believe that a significant unmet medical need exists for new treatment options.

Our Treatment Approach: Turn Back the Clock

We are developing VY-AADC01, an AAV gene therapy product candidate, for the treatment of advanced Parkinson's disease. VY-AADC01 is comprised of the AAV2 capsid, which has been used in multiple AAV gene therapy clinical trials for a number of different diseases, and the cytomegalovirus promoter that drives expression of the AADC transgene. VY-AADC01 is intended to deliver the AADC gene directly into the putamen. Our approach bypasses the dying neurons of the substantia nigra, allowing for the conversion of L-Dopa into dopamine within the putamen. We believe that our approach has the potential to provide patients with clinically meaningful improvements in motor symptoms following a single administration.

Our goal is to restore patients' responsiveness to L-Dopa following treatment with VY-AADC01 to "turn back the clock" on their disease such that the patients' motor symptoms are returned to a well-controlled state, consistent with the level of symptomatic benefit achieved from L-Dopa during the honeymoon period. Following treatment with VY-AADC01, patients with advanced Parkinson's disease will continue to take L-Dopa, but we believe that the required dose will be reduced. The continued administration of L-Dopa will provide a means to titrate dopamine production to further optimize symptomatic control. We believe our approach will increase the conversion of dopamine from L-Dopa in the putamen, resulting in a clinically meaningful improvement in motor symptoms following a single administration.

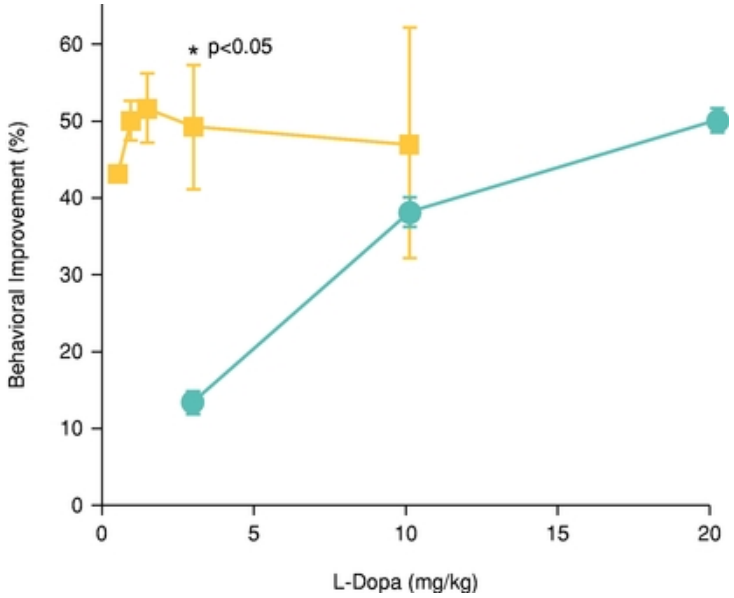
Based upon VY-AADC01's proposed mechanism of action, we believe that if and when it is well-established as a safe and effective therapy for patients with advanced Parkinson's disease, there is the possibility that it could be evaluated as a treatment for patients with less advanced forms of the disease.

Preclinical Studies

Preclinical studies conducted by Krystof Bankiewicz, M.D., Ph.D., one of our co-founders, and his colleagues at UCSF evaluated the safety, efficacy and pharmacological activity of AAV2-AADC gene therapy, a gene therapy substantially similar to VY-AADC01, delivered directly to the putamen in a non-human primate model of Parkinson's disease. Overall, the procedure and vector were well-tolerated with no serious toxicity issues.

Positron emission tomography, or PET, imaging with tracers specific for AADC activity demonstrated a significant and sustained increase of activity in the brain region where the vector had been delivered. Increased responsiveness to L-Dopa was also evidenced by significant behavioral improvements observed pre- and post-treatment with the gene therapy. In five animals, the mean improvement in behavior was determined at various doses of L-Dopa both one month before treatment, as a baseline measure for comparison purposes, and then again six months after treatment. A strong PET signal was observed in all five animals following treatment, confirming delivery of AADC into the putamen. Animals were significantly more sensitive to L-Dopa six months following treatment with the gene therapy when compared to baseline, as shown below.

Behavioral Response to Various Doses of L-Dopa Pre- and Post-Treatment with AAV2-AADC in Non-Human Primates(1)



(1) Adapted by permission from Macmillan Publishers Ltd; Forsayeth et al, *Molecular Therapy* (2006), 14 (4); 571-577, copyright 2006. Blue line represents base line measurements and yellow line represents six months post-treatment measurements.

* A result is considered to be statistically significant when the probability of the result occurring by random chance, rather than from the efficacy of the treatment, is sufficiently low. The conventional method for measuring the statistical significance of a result is known as the "p-value," which represents the probability that chance caused the result (e.g., a p-value = 0.001 means that there is a 0.1% or less probability that the difference between the control group and the treatment group is purely due to random chance).

We believe that these results provide evidence that AADC is active and being expressed at levels sufficient to measure a clinical benefit.

Two animals from this cohort were followed for up to eight years following a single administration of the gene therapy and sustained PET imaging signals for AADC and behavioral signs of efficacy were observed in these animals.

The results of these preclinical studies provided support for the initiation of clinical trials.

Phase 1 Clinical Trials

In a completed open-label Phase 1 clinical trial conducted at UCSF, VY-AADC01 was delivered directly to the putamen of Parkinson's disease patients. The primary endpoints of this trial were safety and tolerability of VY-AADC01. These endpoints were met as VY-AADC01 was well-tolerated and no treatment related SAEs were reported. Furthermore, pharmacologic activity of VY-AADC01 was observed. This trial was completed prior to our involvement in the program, but used a clinical candidate that is currently being used in the ongoing Phase 1b clinical trial. We believe that this clinical candidate will be found to be substantially similar to VY-AADC01. We are currently evaluating whether to use the same vector construct used in the Phase 1 clinical trial and ongoing Phase 1b clinical trial, or to use a slightly modified vector construct.

The Phase 1 clinical trial was conducted in a total of 10 patients with advanced Parkinson's disease. Two doses of VY-AADC01 were tested, 9×10^{10} vector genomes, or vg, and 3×10^{11} vg, with

five patients per dose cohort. The infusion volume was 100µl per putamen, or 200µl per patient. Patients in both cohorts treated with VY-AADC01 showed modest improvements in motor fluctuations. At six months following treatment, off time was observed to be reduced by an average of approximately three hours and a corresponding increase in on time without dyskinesias was also observed. In addition, at six months following treatment, an approximately 30% improvement in on- and off-time measures using the Total Unified Parkinson's Disease Rating Scale, or UPDRS, a widely used rating scale that evaluates cognitive, functional, and motor deficits, as well as medication-related complications, was observed, as shown in the table below.

Summary of UPDRS Results from Phase 1 Trial(1)

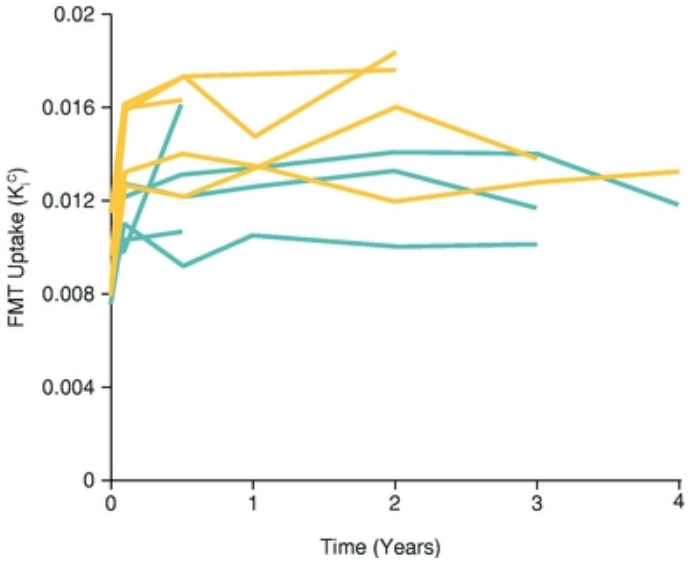
	Off medications				On medications			
	Baseline	6 months	% Change	*p* Value	Baseline	6 months	% Change	*p* Value
Total UPDRS								
Low-dose cohort	69.6	49.6	–28	0.04	32.6	21.8	–33	0.024
High-dose cohort	62.4	41.3	–33	0.001	29.7	20.5	–31	0.08
Combined cohorts	66	45.5	–31	0.0008	31.2	21.2	–32	0.004

(1) Christine et al, *Neurology* (2009), 73: 1662-1669. The row titled "Low-dose cohort" represents data from the five patients treated with 9 X 10^{10} vg of VY-AADC01. The row titled "High-dose cohort" represents data from the five patients treated with 3 X 10^{11} vg of VY-AADC01. The row titled "Combined cohorts" represents data from all ten patients treated with VY-AADC01. The data in the columns under the header "Off medications" represents periods during which patients' medications were not working as measured by a patient's total UPDRS score at baseline, before treatment with VY-AADC01, and at six months following treatment with VY-AADC01, along with percent change from baseline to six months and the corresponding p-value. The data in the columns under the header "On medications" represents periods during which patients' medications were working as measured by a patient's total UPDRS score at baseline, before treatment with VY-AADC01 and at six months following treatment with VY-AADC01, along with percent change from baseline to six months and the corresponding p-value. A result is considered to be statistically significant when the probability of the result occurring by random chance, rather than from the efficacy of the treatment, is sufficiently low. The conventional method for measuring the statistical significance of a result is known as the "p-value," which represents the probability that chance caused the result (e.g., a p-value = 0.001 means that there is a 0.1% or less probability that the difference between the control group and the treatment group is purely due to random chance). Because of the small size of this trial, the p-values may not be reliable or repeatable, and may not be duplicated in future trials.

While no gene therapy related SAEs were reported, three patients experienced minor hemorrhages related to the surgical procedure. Two of the hemorrhages were asymptomatic, noticed only on imaging, and one was symptomatic with the patient making an almost complete recovery. Nevertheless, the stereotactic injection protocol used in the surgical procedure was modified to avoid specific blood vessels and no further hemorrhages were reported. The implementation of real-time MRI guidance in the ongoing Phase 1b clinical trial is a significant advancement in vector delivery.

The 10 patients were assessed clinically for up to four years after treatment and a durable, dose-dependent expression of AADC was observed. Patients treated with the low dose gene therapy were observed to have an increased PET signal, or uptake of the ^{18} fluoro-meta-tyrosine tracer, or ^{18} FMT, indicative of AADC expression and activity that persisted for up to four years. Patients treated with the high dose gene therapy were observed to have an increased PET signal that was greater on average when compared to the low dose cohort, which also persisted for up to four years.

Long-Term AADC Expression as Measured by PET Imaging in Patients Treated with High and Low Doses of AAV Gene Therapy in a Phase 1 Clinical Trial[(1)]



(1) Mittermeyer et al, *Human Gene Therapy* (2012), 23: 377-381. The publisher for this copyrighted material is Mary Ann Liebert, Inc. publishers. Blue lines represent patients treated with the low dose and yellow lines represent patients treated with the high dose.

A similar Phase 1 clinical trial was conducted at Jichi Medical University, or JMU, in Japan using the same vector that was used in the UCSF trial. The primary endpoints of this trial were safety and tolerability of the treatment. These endpoints were met as the treatment was well-tolerated and no treatment related SAEs were reported. Six patients were treated in this trial and an enhanced PET signal was observed in a subset of patients monitored 96 weeks following treatment. An open-label Phase 1/2 trial is currently being conducted at JMU. The primary endpoints of this trial are safety and tolerability of the treatment. This trial is using lower infusion volumes and doses compared to the ongoing Phase 1b trial at UCSF. Importantly, the JMU trial is not using real-time, intra-operative MRI guidance.

While the prior UCSF and JMU clinical results were encouraging and provided evidence of long-term AADC expression, the magnitude of the clinical benefits observed did not exceed placebo effects observed in previous surgical therapy trials in Parkinson's disease patients, and the UCSF and JMU trials were not blinded. Further, based on post-operative imaging and our current work using intra-operative MRI monitoring, we estimate that less than 10% of the putamen volume was covered by the infusion in these trials, which reflects suboptimal distribution of VY-AADC01 in the putamen. We believe that there is an opportunity to further optimize the delivery, dose and infusion volume of VY-AADC01 to substantially increase the coverage of the putamen in order to achieve a more substantial clinical benefit.

Our Program Status

In 2014, UCSF initiated an open-label Phase 1b clinical trial to optimize the development of VY-AADC01. The IND for the Phase 1b trial was filed in July 2013. The primary endpoints of this trial are safety and tolerability of the treatment. This trial incorporates three key design features:

1. Use of the Clearpoint System to provide real-time, intra-operative MRI during surgery to visualize the delivery of VY-AADC01 to the putamen.

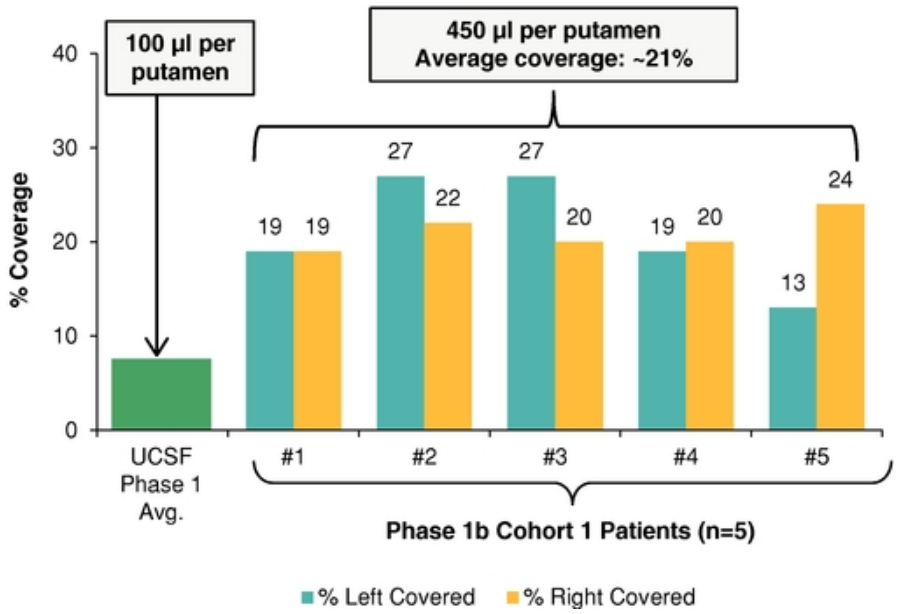
2. Larger infusion volumes designed to increase coverage of the putamen with VY-AADC01.

3. Higher doses of VY-AADC01 compared to the previously completed Phase 1 trial.

Secondary endpoints of this trial, which will be used to assess the potential pharmacologic activity of VY-AADC01, include UPDRS, AADC PET imaging and a behavioral test using intravenous L-Dopa treatment to measure changes in a patients' sensitivity to L-Dopa.

In this Phase 1b trial, up to 20 patients with advanced Parkinson's disease are expected be treated with VY-AADC01. A total of five patients in the first dose cohort have been treated with a 7.5×10^{11} vg dose using a 450µl infusion volume per putamen, or 900µl per patient, and no SAEs have been observed to date. As shown below, the coverage of the putamen achieved in the first cohort ranged from 13% to 27% and the average coverage was 21%. While the coverage in the first cohort improved relative to the below 10% coverage of the putamen that we estimated was achieved in the prior UCSF Phase 1 trial, we believe that the coverage needs to be further increased. No meaningful signals of efficacy have been observed in these patients to date. We are continuing to analyze the raw data from the first cohort.

Coverage of Putamen Achieved in First Cohort of Phase 1b Trial



A protocol amendment was submitted and approved by the FDA to increase the infusion volume up to 900µl per putamen, or 1,800µl per patient with a goal of further increasing coverage of the putamen, particularly the posterior putamen, which receives VY-AADC01 treatment. The first patient in the second cohort was treated in June 2015. Once we are able to optimize for vector delivery and coverage, we then intend to increase and optimize the dose and concentration of VY-AADC01 used in this trial. We anticipate opening a second clinical trial site before the end of 2015 to facilitate enrollment in this trial.

ALS Program: VY-SOD101

Disease Overview

ALS is a fatal neurodegenerative disease that leads to muscle weakness and loss of mobility as well as impaired speech, swallowing and breathing, with many patients requiring ventilator support as the disease progresses. The age of onset of ALS is typically around 50 years. However, most ALS patients

only live an average of three years after initial symptoms appear, and it is estimated that as many as 30,000 patients in the United States are living with the disease according to the ALS Association. Familial, or inherited, ALS accounts for approximately 10% of ALS cases according to a 2006 article published in *Neuron*, and an estimated 20% of familial ALS is caused by mutations in the superoxide dismutase 1, or SOD1, gene according to a study published in the *European Neurological Journal*. Therefore, there are an estimated 600 patients in the United States with ALS caused by mutations in the SOD1 gene.

The normal function of the SOD1 protein is to break down toxic molecules. Mutations in SOD1 have been shown to lead to the formation of toxic aggregates of the mutated protein, resulting in the death of motor neurons. Patients with familial ALS caused by certain mutations in the SOD1 gene progress more rapidly than patients with other forms of ALS, although the reason for this more rapid progression is unknown.

There is currently only one FDA-approved treatment for ALS, riluzole, which has been shown to have only modest efficacy, prolonging life by just a few months.

Our Treatment Approach

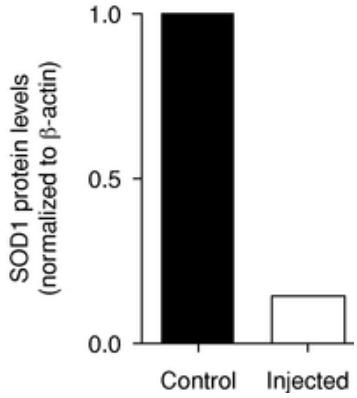
We believe that AAV gene therapy is an attractive approach to treat monogenic ALS. Since the SOD1 gene mutations that cause ALS are toxic gain-of-function mutations that result in the overexpression of toxic versions of the protein, we believe that we can employ an AAV gene therapy approach that targets the knockdown of SOD1. In addition, the target cells, motor neurons and astrocytes, or cells supporting the neurons, reside within and surrounding the spinal cord and brain stem, which we believe can be effectively targeted with AAV gene therapy through intrathecal injection. The goal of VY-SOD101 is to knock down expression of SOD1, thereby reducing the level of mutated protein in the target cells in the spinal cord and brain stem to preserve motor neurons, slow the progression of the disease and prolong ventilator-independent survival.

We believe that there is also the potential to leverage our approach for the treatment of other genetically defined forms of ALS.

Preclinical Studies Targeting SOD1 for Monogenic ALS

Results from preclinical studies conducted at The Ohio State University support targeting mutant SOD1 for the treatment of monogenic ALS. In a non-human primate model, significant knockdown of SOD1 expression was observed following intrathecal injection of an AAV vector carrying target DNA designed to inhibit SOD1 expression. As shown in the figure below, SOD1 protein levels were successfully knocked down by greater than 80%, on average, in three non-human primates. SOD1 protein levels were normalized in this study to ß-actin as a control. In addition, SOD1 expression in motor neurons was observed to be knocked down by 95%, on average, in this cohort compared to a control group. No side effects from the treatment were reported.

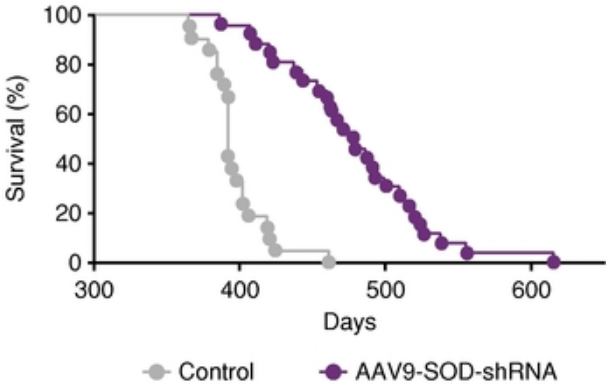
Knockdown of SOD1 Using AAV-Mediated Delivery in Non-Human Primates[(1)]



(1) Reprinted by permission from Macmillan Publishers Ltd: Foust et al, *Molecular Therapy* (2013), 21 (12); 2148-2159, copyright (2013).

The knockdown of SOD1 has also been observed to provide a significant survival benefit in an animal model. As shown below, mice with a SOD1 mutation treated with an AAV vector to knock down expression of the SOD1 gene achieved median survival of 87 days longer compared to mice treated with a control vector.

Improved Survival Post Knockdown of SOD1[(1)]



(1) Reprinted by permission from Macmillan Publishers Ltd: Foust et al, *Molecular Therapy* (2013), 21 (12); 2148-2159, copyright (2013). Purple line represents mice treated with AAV gene therapy, while gray line represents control mice.

We believe the viability of our proposed delivery approach for VY-SOD101 is supported by our proof-of-principle work demonstrating successful AAV gene therapy delivery to the spinal cord of non-human primates through intrathecal injection.

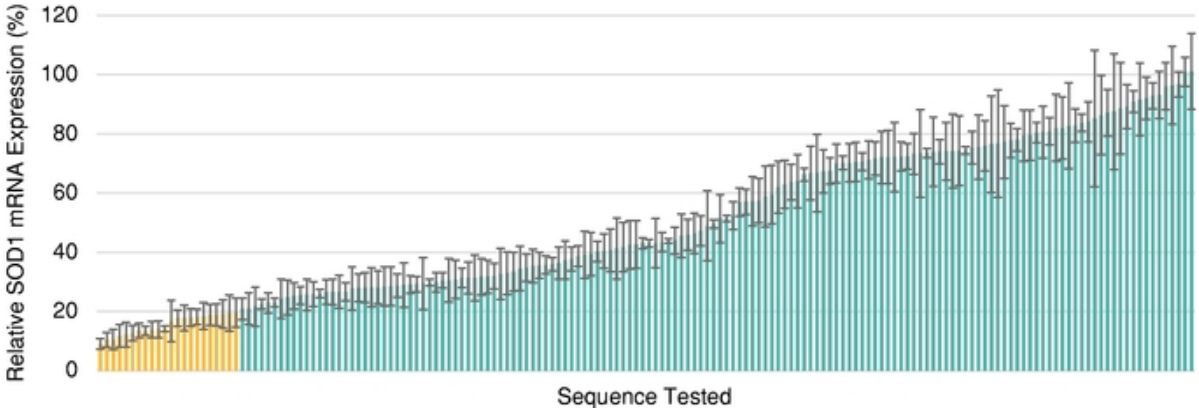
Our Program Status

VY-SOD101 is in preclinical development. We are optimizing the transgene, the promoter, the capsid and the dosing paradigm for this program.

Through our product engine efforts, we are constructing and optimizing the transgene, including the microRNA, or miRNA, cassette that will be inserted into an AAV vector to achieve targeted knockdown of SOD1 expression with RNA interference, or RNAi, a biological process in which RNA molecules inhibit gene expression. The miRNA cassette is being optimized with respect to a number of

characteristics that affect specificity for the SOD1 target gene and knockdown potency. Beyond the miRNA cassette sequence, we are optimizing other design aspects of the transgene to improve the overall effectiveness of our approach. We have screened more than 100 RNAi sequences, each represented by a bar in the graph below, and have successfully identified multiple, highly-potent RNAi sequences targeting SOD1, as highlighted by the yellow bars in the figure below:

Overview of miRNA Target Sequences for Knockdown of SOD1



We are in the process of completing a number of AAV capsid screening experiments to identify the capsid that we believe is optimal for the VY-SOD101 program. We are screening capsids in non-human primates following intrathecal injection, and are evaluating capsids based upon multiple criteria, including safety, overall level of transgene expression achieved, distribution of transgene expression and specific cell types transduced.

In addition, we are evaluating intrathecal dosing paradigms for the best distribution and delivery to the relevant regions of the spinal cord and brain stem. We are studying parameters such as site of intrathecal administration, volume of administration and rate of infusion to identify the dosing paradigm that we believe will translate into an effective therapy in patients.

We expect to use relevant animal models to select our lead candidate for this program. Once a lead candidate and intrathecal dosing paradigm are identified, we plan to complete a number of preclinical studies to evaluate the safety and pharmacology of our lead candidate, including IND-enabling studies. We expect that the first clinical trial of VY-SOD101 will enroll ALS patients with relevant mutations in the SOD1 gene, bypassing the more traditional approach of enrolling healthy volunteers.

Friedreich's Ataxia Program: VY-FXN01

Disease Overview

Friedreich's ataxia is a debilitating neurodegenerative disease resulting in poor coordination of legs and arms, progressive loss of the ability to walk, generalized weakness, loss of sensation, scoliosis, diabetes and cardiomyopathy as well as impaired vision, hearing and speech. The typical age of onset is 10 to 12 years, and life expectancy is severely reduced with patients generally dying of neurological and cardiac complications between the ages of 35 and 45. According to the Friedreich's Ataxia Research Alliance, there are approximately 6,400 patients living with the disease in the United States and there are currently no FDA-approved treatments for the disease.

Friedreich's ataxia patients have mutations of the FXN gene that reduce production of the frataxin protein, resulting in the degeneration of sensory pathways and a variety of debilitating symptoms. Friedreich's ataxia is an autosomal recessive disorder, meaning that a person must obtain a defective copy of the FXN gene from both parents in order to develop the condition. One healthy copy of the FXN gene, or 50% of normal frataxin protein levels, is sufficient to prevent the disease phenotype. We believe that this will provide the approximate level of gene replacement necessary for successful treatment with an AAV gene therapy.

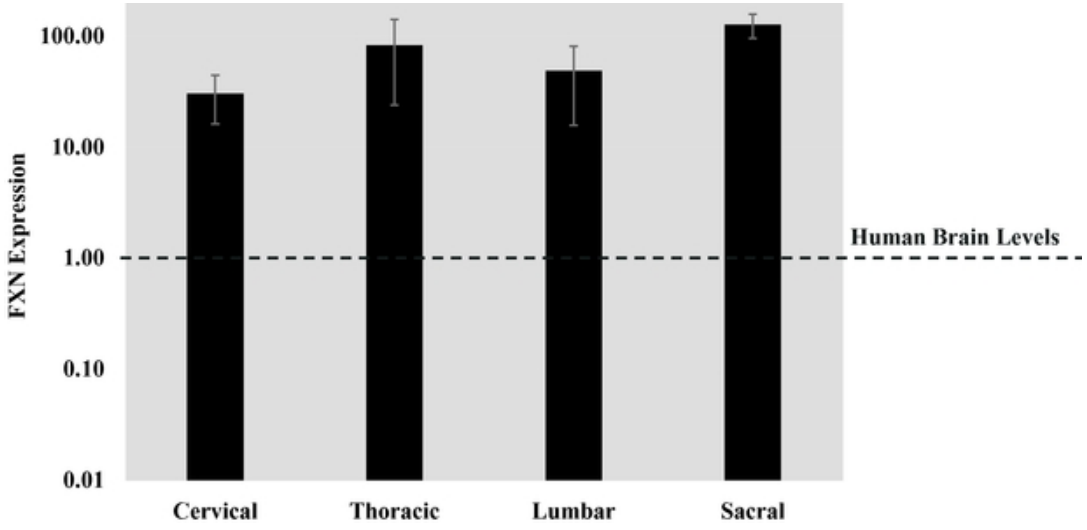
Our Treatment Approach

We believe that an AAV gene therapy approach that delivers a functional version of the FXN gene to the sensory pathways through intrathecal injection has the potential to improve the balance, ability to walk, sensory capability, coordination, strength and functional capacity of Friedreich's ataxia patients. Unlike in many genetic disorders, most Friedreich's ataxia patients normally produce very low levels of the frataxin protein, which although insufficient to prevent the disease, exposes the patient's immune system to frataxin. This reduces the likelihood that the FXN gene delivered with AAV gene therapy will trigger harmful immune response.

Preclinical Studies

We conducted preclinical studies in non-human primates and achieved high FXN expression levels within the target sensory ganglia, or clusters of neurons, along the entire length of the spinal region following intrathecal injection. As depicted in the figure below, FXN expression was normalized as a fold increase relative to FXN expression in a human brain reference sample. The levels of FXN expression observed using an AAVrh10 vector were, on average, greater than FXN levels present in normal human brain tissue. The increased levels of FXN were achieved across the entire length of the spinal region including the cervical, thoracic, lumbar and sacral levels. Relatively low, but measurable, levels of FXN expression were also observed in the cerebellar dentate nucleus, another area of the CNS that is often affected in Friedreich's ataxia, and that is often considered difficult to target therapeutically.

FXN Expression in Sensory Ganglia Following Intrathecal Delivery in Non-Human Primates



Our Program Status

VY-FXN01 is currently in preclinical development. We are in the process of completing a number of AAV capsid screening experiments to identify the capsid that we believe is optimal for the VY-FXN01 program. We are comparing capsids in non-human primates following intrathecal injection, and we are evaluating these capsids based upon multiple criteria including safety, overall level of transgene expression achieved, distribution of transgene expression and the specific cell types transduced. In addition, we are optimizing the promoter and specific characteristics of the FXN transgene that we expect to use for VY-FXN01. We also have a significant effort focused on better understanding the clinical course of Friedreich's ataxia and identifying potential clinical endpoints for future clinical trials.

Once we identify a lead candidate for this program, we plan to complete a number of preclinical studies to evaluate the safety and efficacy of our lead candidate, including studies in relevant animal models of Friedreich's ataxia and IND-enabling studies. We expect that the first clinical trial of VY-FXN01 will enroll Friedreich's ataxia patients, bypassing the more traditional approach of enrolling healthy volunteers.

Huntington's Disease Program: VY-HTT01

Disease Overview

Huntington's disease is a fatal, inherited neurodegenerative disorder that results in the progressive decline of motor and cognitive functions and a range of behavioral and psychiatric disturbances, including depression. The average age of onset is 40, with patients typically dying approximately 17 to 20 years following diagnosis. According to Huntington's Disease Society of America, Huntington's disease affects approximately 30,000 patients in the United States. Huntington's disease is caused by mutations in the huntingtin, or HTT, gene. Huntington's disease is an autosomal dominant disorder, which means that an individual is at risk of inheriting the disease if only one parent is affected. While the exact function of the HTT gene in healthy individuals is unknown, it is essential for normal development before birth and mutations in the HTT gene ultimately lead to the production of abnormal intracellular huntingtin protein aggregates that cause neuronal cell death. Currently, there are no approved treatments targeting the underlying cause of the disease and only one drug, tetrabenazine, has been approved for the treatment of the specific motor symptoms of Huntington's disease.

Our Treatment Approach

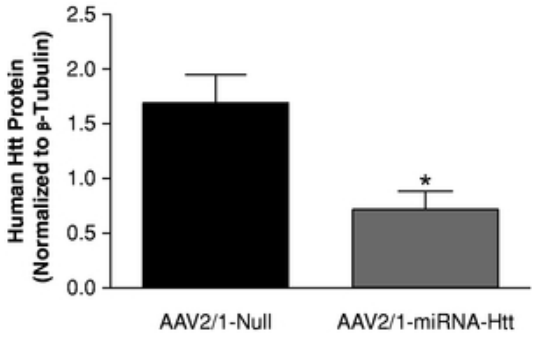
We believe that AAV gene therapy is an attractive approach to treat Huntington's disease. Since HTT mutations that cause Huntington's disease are toxic gain-of-function mutations, we believe that we can employ an AAV gene therapy approach designed to knock down expression of the HTT gene. In addition, the targeted cells for treatment primarily reside in discrete regions of the brain, the striatum and the cortex, that can be targeted with AAV gene therapy delivered directly to these site-specific regions. The goal of VY-HTT01 is to knock down expression of the HTT gene, thereby reducing the level of mutated HTT protein in these brain regions and slowing the progression of the cognitive and motor symptoms associated with Huntington's disease. We believe that we can use the same surgical approach for this program that has been used for VY-AADC01 delivery to the brain, allowing us to leverage prior clinical experience.

Preclinical Studies

Our collaborators at Genzyme have completed significant preclinical work focused on AAV gene therapy for Huntington's disease. Genzyme's preclinical studies in a mouse model of Huntington's disease demonstrated the safety and efficacy of AAV gene therapy targeting the knockdown of the HTT gene in the CNS.

As shown in the figure below, using an AAV vector delivered directly to the CNS, HTT gene expression was observed to be reduced by over 50%, on average, in the treatment group as compared to the control group. HTT protein levels were normalized in this study to b-Tubulin as a control. No signs of toxicity were reported.

Knockdown of HTT Following AAV Delivery(1)

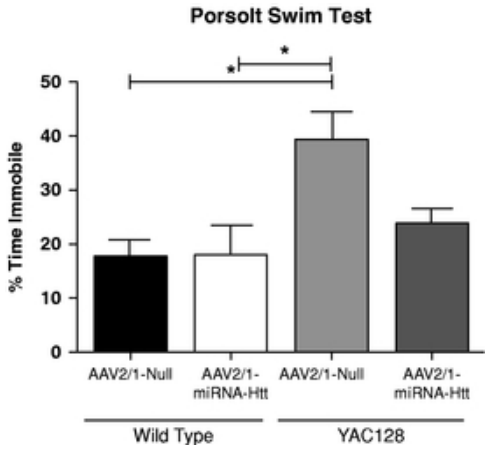


(1) Stanek et al, *Human Gene Therapy* (2014); 25; 461-474. The publisher for this copyrighted material is Mary Ann Liebert, Inc. publishers.

*p<0.05

In addition, a significant functional benefit was observed in the treatment group, as measured by the Porsolt Swim Test, which is commonly used to measure depressive behavior in mice. In the figure below, both normal, or wild type mice, and mice with the mutation, or YAC128, were evaluated following treatment with either an AAV vector targeting the knockdown of the HTT gene, labeled as AAV2/1-miRNA-Htt below, or a negative control vector, labeled as AAV2/1-Null below. As expected, knocking down HTT in the control mice was observed to have no functional impact.

Motor Deficit Reduction in an Animal Model of Huntington's Disease(1)



(1) Stanek et al, *Human Gene Therapy* (2014); 25; 461-474. The publisher for this copyrighted material is Mary Ann Liebert, Inc. publishers.

*p<0.05

Our Program Status

VY-HTT01 is currently in preclinical development. Genzyme's Huntington's disease gene therapy program was combined with our efforts in connection with entering into our collaboration agreement in February 2015. We are optimizing the transgene, the capsid and the dosing paradigm for this program.

Through our product engine efforts, we are constructing and optimizing the transgene, including the miRNA cassette that will be inserted into an AAV vector to achieve targeted knockdown of HTT expression with RNAi. We are optimizing the miRNA cassette with respect to a number of characteristics that affect specificity for the HTT target gene and knockdown potency. Beyond the miRNA cassette sequence, we are optimizing other design aspects of the transgene to improve the overall effectiveness of our approach. This work leverages the learnings from the VY-SOD101 program, as the miRNA cassettes designed are anticipated to be applicable to the VY-HTT01 program. We are also optimizing the promoter that we expect to use for VY-HTT01.

In addition, we are in the process of confirming in non-human primate studies that the current lead capsid is optimal for the VY-HTT01 program. Capsids are being compared in non-human primates following direct injection into the striatum or intrathecal injection, and are being evaluated based upon multiple criteria, including safety, overall level of transgene expression achieved, distribution of transgene expression and the specific cell types transduced.

We are evaluating direct injection into the striatum and intrathecal dosing paradigms for the best distribution and delivery to the relevant regions of the brain, the striatum and cortex. Parameters such as site of administration, volume of administration and rate of infusion are being studied to identify the dosing paradigm that we believe will translate into an effective therapy in patients.

Once we identify a lead candidate and dosing paradigm for this program, we plan to complete a number of preclinical studies to evaluate the safety, pharmacology and efficacy of our lead candidate, including studies in relevant animal models and IND-enabling studies. We expect that the first clinical trial of VY-HTT01 will enroll Huntington's disease patients, bypassing the more traditional approach of enrolling healthy volunteers.

SMA Program: VY-SMN101

Disease Overview

SMA is an inherited neuromuscular disease that results in progressive muscle weakness and paralysis. It is estimated that SMA affects approximately 10,000 patients in the United States according to the SMA Foundation. Patients with SMA may have difficulty sitting, standing, walking, eating and breathing, depending upon the severity of the disease. There are four primary types of SMA, with SMA type I being the most severe. SMA type I is the leading genetic cause of death in infancy and early childhood in the United States and accounts for approximately 50% of all SMA cases. Infants affected by SMA type I never sit or stand and usually die of respiratory failure before two years of age. SMA type II is of intermediate severity, with onset at approximately seven to 18 months of age and a slower progression compared to type I. Children with SMA type II will generally sit, but never stand. SMA type III is less severe, presenting at 18 months of age or later, and SMA type IV is a mild adult subtype generally presenting in patients between 20 and 30 years of age. There are currently no approved treatments for any type of SMA.

SMA is caused primarily by mutations of the SMN1 gene, which eliminate full-length protein expression of the SMN1 gene. Clinical severity is related to the number of copies of the SMN2 gene, which is able to produce small amounts of functional protein. The precise role of the SMN protein in the pathogenesis of SMA is unknown. SMA is an autosomal recessive disorder. One healthy copy of the SMN1 gene, or 50% of normal SMN1 protein levels, is sufficient to prevent the disease phenotype.

We believe this will provide the approximate level of gene replacement necessary for successful treatment with an AAV gene therapy.

Our Treatment Approach

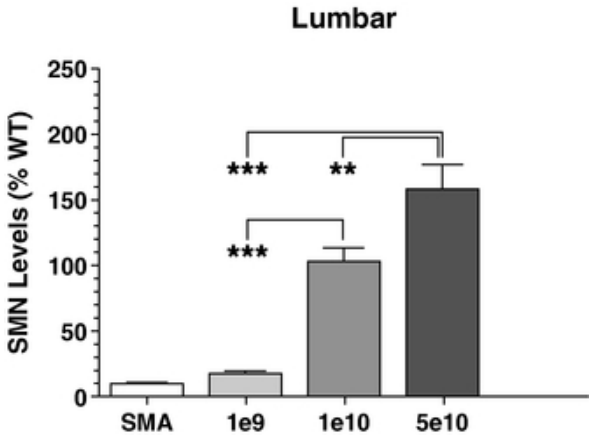
We believe that an AAV gene therapy that delivers a functional version of the SMN1 gene to the spinal cord and brainstem through intrathecal injection has the potential to prolong survival, increase the amount of time of independent respiration and improve clinical and electrophysiological measures of motor function in severe SMA patients. Unlike many genetic disorders, most SMA patients normally produce very low levels of the SMN1 protein, which although insufficient to prevent the disease, exposes the patient's immune system to the SMN1 protein. This reduces the likelihood that the SMN1 gene delivered with AAV gene therapy will trigger a harmful immune response.

Preclinical Studies

Our collaborators at Genzyme have completed significant preclinical work focused on AAV gene therapy for SMA. Preclinical animal model studies demonstrated the safety and efficacy of SMN1 gene replacement delivered directly into the CNS.

Studies completed in a transgenic mouse model of SMA demonstrated that the SMN1 gene could be successfully delivered to the spinal cord in a vector dose-dependent fashion, as shown in the figure below. At the highest AAV dose tested, 5×10^{10} vg, or 5e10 vg, the average SMN1 expression observed in the lumbar region of the spinal cords of the treatment group was approximately 150% of the control group.

Replacement of SMN1 Using AAV Gene Therapy(1)

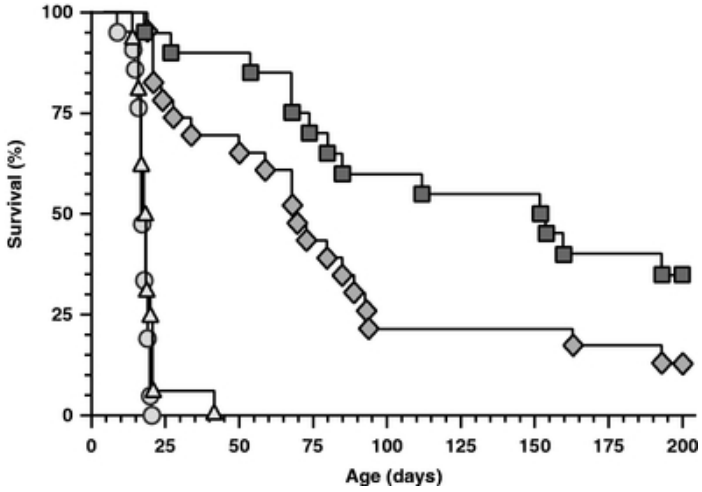


(1) Passini et al, *Human Gene Therapy* (2014); 25; 619-630. The publisher for this copyrighted material is Mary Ann Liebert, Inc. publishers. SMN levels in control SMA mice vs. SMA mice treated with escalating doses of AAV9-hSMN1.

**p<0.01 ***p<0.001

In the same transgenic mouse model, replacement of the SMN1 gene using AAV gene therapy was delivered directly to the CNS demonstrated an improvement in survival in the treatment groups compared to the control group, as shown in the figure below. The median survival benefit at the highest dose tested, represented by the square line below, was 136 days longer than the median survival benefit for the control group, represented by the circle line below.

Survival Post Replacement of SMN1 Using AAV Gene Therapy[(1)]



(1) Passini et al, *Human Gene Therapy* (2014); 25; 619-630. The publisher for this copyrighted material is Mary Ann Liebert, Inc. publishers. Overall survival post treatment with: saline (circle); or escalating doses of AAV9-hSMN1 (triangle, diamond, square).

We believe the viability of our proposed delivery approach for VY-SMN101 is supported by our proof-of-principle work demonstrating successful AAV gene therapy delivery to the spinal cord of non-human primates through intrathecal injection.

Our Program Status

VY-SMN101 is currently in preclinical development. Genzyme's SMA gene therapy program was contributed to us in connection with entering into our collaboration agreement in February 2015.

We are in the process of completing a number of AAV capsid screening experiments to identify the capsid that we believe is optimal for the VY-SMN101 program. We are screening capsids in non-human primates following intrathecal injection, and are evaluating based upon multiple criteria, including safety, overall level of transgene expression achieved, distribution of transgene expression and the specific cell types transduced. Genzyme has already optimized the promoter and transgene for VY-SMN101.

Once we identify a lead candidate and dosing paradigm for this program, we plan to complete a number of preclinical studies to evaluate the safety, pharmacology and efficacy of our lead candidate, including studies in relevant animal models and IND-enabling studies. We expect that the first clinical trial of VY-SMN101 will enroll SMA patients, bypassing the more traditional approach of enrolling healthy volunteers.

Future Programs

We are evaluating additional severe CNS diseases that could be treated using AAV gene therapy through application of either a gene replacement or a gene knockdown approach. Beyond these approaches, we are also actively exploring additional potential treatment methods that can utilize an AAV vector, including the direct delivery of monoclonal antibodies to the CNS, as well as gene editing to correct or delete a gene in the cell genome. We believe that AAV-based delivery of antibodies to the CNS could be used to treat diseases such as frontotemporal dementia and Alzheimer's disease and that gene editing could be applied to a number of different genetic diseases.

Collaborations and License Agreements

Genzyme Collaboration

In February 2015, we entered into a strategic collaboration with Genzyme to leverage our combined expertise and assets to develop AAV gene therapies for CNS diseases. Under the agreement, we retained U.S. rights to VY-AADC01 and VY-FXN01, as well as at least co-commercialization rights to VY-HTT01 in the United States. VY-SOD101 is not included as part of the Genzyme collaboration and we retain unencumbered worldwide rights to this program. We have granted Genzyme an exclusive option to license, develop and commercialize (i) ex-U.S. rights to the following programs, which we refer to as the Split Territory Programs, VY-AADC01, VY-FXN01, a future program to be designated by Genzyme, or Future Program, and VY-HTT01 with an incremental option to co-commercialize VY-HTT01 in the United States, and (ii) worldwide rights to VY-SMN101. Genzyme's option for the Split Territory Programs and VY-SMN101 is triggered following the completion of the first proof-of-principle human clinical study, or POP Study, on a program-by-program basis.

Prior to any option exercise by Genzyme, we will collaborate with Genzyme in the development of products under each Split Territory Program and VY-SMN101 pursuant to a written development plan and under the guidance of an alliance joint steering committee, comprised of an equal number of our employees and Genzyme employees.

We are required to use commercially reasonable efforts to develop products under each Split Territory Program and VY-SMN101 through completion of the applicable POP Study. During the development of our joint programs, our and Genzyme's activities are guided by a Development Advisory Committee, which we refer to as the DAC. The DAC may elect to utilize certain Genzyme technology relating to the VY-AADC01 program, the VY-HTT01 Program, or generally with the manufacture of Split Territory Program products.

We will be solely responsible for all costs incurred in connection with the development of Split Territory Programs and VY-SMN101 products prior to option exercise, subject to the following: (i) Genzyme may agree to provide additional funds in return for agreed-upon payback or other agreed economic terms; (ii) we may request, and upon mutual agreement, Genzyme will provide in-kind services valued at up to $5.0 million; and (iii) expenses of certain activities under the VY-HTT01 development plan may be funded to the extent such activities are reimbursed through financial support that Genzyme may receive from a disease foundation group.

Other than the VY-AADC01 program (for which a POP Study has already been commenced), if we do not initiate a POP Study for a given Split Territory Program by December 31, 2026 (or for the Future Program by the tenth anniversary of the date the Future Program is nominated by Genzyme), and Genzyme has not terminated this agreement with respect to such Collaboration program, then Genzyme shall be entitled, at its sole and exclusive remedy, to a credit of $10.0 million for each such program against other amounts payable by Genzyme under the Collaboration. However, if we do not initiate a POP Study by such date as a result of a regulatory delay or a force majeure event, such time period shall be extended for so long as such regulatory delay or force majeure event continues and we shall not be deemed to have failed to initiate a POP Study.

Post-Option Exercise

Upon Genzyme's exercise of its option to license a given product in a Split Territory Program, which we refer to as a Split Territory Licensed Product, we will have sole responsibility for the development of such Split Territory Licensed Product in the United States and Genzyme shall have sole responsibility for development of such Split Territory Licensed Product in the rest of the world. We and Genzyme will have shared responsibility for execution of ongoing development of such Split Territory Licensed Product that is not specific to either of our territories, including costs associated therewith.

A steering committee for each Program will review and approve a written plan and budget for each relevant program. In addition, all development activities to be undertaken with respect to each Split Territory Licensed Product by or on behalf of either party will be set forth in a written development plan.

Genzyme shall have the sole right to develop the VY-SMN101 Product worldwide. Genzyme shall be responsible for all of the development costs that occur after the option exercise date for such VY-SMN101 Product.

Commercialization

We shall be solely responsible, at our expense, for all commercialization activities relating to Split Territory Licensed Products in the United States. Genzyme shall be solely responsible, at its expense, for all commercialization activities relating to Split Territory Licensed Products in the rest of the world. If Genzyme has exercised the co-commercialization option, Genzyme will be the lead party responsible for all commercialization activities relating to Huntington's disease products in the United States. If Genzyme has exercised its option to co-commercialize VY-HTT01 in the United States, commercialization activities that are undertaken for each VY-HTT01 product in the United States will be set forth in reasonable detail in a written commercialization plan.

Genzyme shall be solely responsible, at its expense, for all commercialization activities relating to VY-SMN101 products worldwide. Genzyme shall use commercially reasonable efforts to commercialize the VY-SMN101 products in each major market specified in the agreement where Genzyme has obtained required governmental approvals.

Financial Terms

We received $65.0 million in upfront cash, a $30.0 million upfront equity investment and an in-kind commitment of $5.0 million, totalling $100 million. If Genzyme exercises its option for a Split Territory Program, with the exception of VY-AADC01, Genzyme is required to make an option exercise payment of $20.0 million or $30.0 million for each Split Territory Program. In addition, Genzyme shall pay us up to $645 million across product programs upon the achievement of specified regulatory and commercial milestones.

In addition, to the extent any Split Territory Licensed Product or the VY-SMN101 Product is commercialized, we are be entitled to receive tiered royalty payments ranging from the mid-single digits to mid-teens based on a percentage of net sales. Genzyme is entitled to receive royalty payments from us related to sales of the Split Territory Licensed Products ranging from the low single digits to mid-single digits, depending on whether we use Genzyme technology in a Split Territory Licensed Product or the VY-SMN101 Product. If Genzyme exercises its option to co-commercialize VY-HTT01 in the United States, we will share any profits or losses from VY-HTT01 product sales.

Term And Termination; Remedies

Our collaboration agreement with Genzyme will continue in effect until the later of (i) the expiration of the last to expire of the option rights and (ii) the expiration of all payment obligations unless sooner terminated by us or Genzyme.

We and Genzyme have customary termination rights including the right to terminate for an uncured material breach of the agreement committed by the other party and Genzyme has the right to terminate for convenience.

License Agreement with University of Massachusetts

On January 30, 2014, we entered into a license agreement with the University of Massachusetts, or UMass, pursuant to which UMass granted us an exclusive, worldwide, royalty-bearing license to certain of its licensed patents to make, have made, use, offer for sale, sell, have sold and import certain licensed products in the field of human diseases that use gene therapy applications. Our license is subject to any rights that may be required to be granted to the government of the United States, and UMass reserves the right to use the licensed patents for education and research and, with our consent, for non-commercial patient care, without the payment of any compensation to us.

In consideration for rights granted to us under the agreement, we made an upfront payment of $200,000 to UMass. We are obligated to pay UMass (i) single low digit royalty payments based on net sales of the licensed products, (ii) annual maintenance payments of $30,000, which are creditable against royalties payable in such period, (iii) minimum aggregate annual royalty payments that are creditable against royalties payable in such period, with the minimum aggregate amount payable being in the low-six digits for each of the first four years of this agreement and a minimum aggregate amount payable being in the mid-six digits for each year, thereafter, (iv) milestone payments of up to $1.8 million, per licensed product for the first five licensed products, based on the achievement of development and regulatory milestones and (v) a percentage of sublicensing income that decreases over time from low double digit percentages to a mid-single digit percentage. We also agreed to reimburse UMass approximately $678,000 for patent related expenses incurred by UMass as of the effective date of the agreement over a two year period.

Under the agreement, we agreed to use commercially reasonable efforts to develop licensed products and to introduce such licensed products into the commercial market, and further agreed to certain development milestones.

The agreement will terminate on the date that is the later of (i) seven years after the first commercial sale of the last licensed product under the agreement or (ii) such time as there are no valid claims covering a licensed product. We have the right to terminate the agreement for any reason upon 90 days prior written notice, and we and UMass have the right to terminate the agreement if the other party fails to cure a written breach within 60 days of receiving written notice of such breach.

MassBiologics and UMass Collaboration Agreement

On October 20, 2014, we entered into a Collaboration Agreement with UMass and MassBiologics, pursuant to which we shall (i) fund certain projects that will be conducted by UMass or MassBiologics, (ii) fund certain educational programs of UMass, including post-doctoral research at our laboratories beginning in 2015 and an annual lecture series beginning in 2015 and (iii) collaborate with MassBiologics to establish scalable processes for manufacturing recombinant AAV vector products using cGMP.

In November 2014, we agreed to the first project under this agreement whereby we will fund approximately $2.9 million over a 16-month period for certain research and development services performed by MassBiologics. The project commenced in January 2015. If the agreement is terminated for any reason, we are obligated to fund the remaining balance of the total price of all work completed and any other out of pocket costs incurred by MassBiologics. We and UMass and/or MassBiologics may agree to conduct other projects in the future, the terms of which will be agreed upon at such time.

This agreement will remain in effect for a period of five years and automatically renews for additional one year periods. Either party has the right to terminate this agreement, once in each renewal period, for any reason upon providing the other party with 90 days written notice or in the event of a material breach of the agreement by the other party that is not cured within 60 days of written notice.

We will own all intellectual property rights generated under this agreement, either by our employees, UMass and/or MassBiologics employees, or jointly by our employees and UMass and/or MassBiologics employees, that cover AAV materials. We and UMass and/or MassBiologics, as applicable, will jointly own any intellectual property rights generated under this agreement jointly by our employees and the employees of UMass and/or MassBiologics, as applicable, that do not cover AAV materials.

License Agreement with REGENX

In May 2014, we entered into a license agreement with REGENXBIO Inc., formerly known as ReGenX Biosciences, LLC, or REGENX, for the development and commercialization of gene therapies to treat ALS, Friedreich's ataxia and Huntington's disease. Under this license agreement, REGENX granted us a non-exclusive worldwide license to make, have made and use its technology solely for internal research and preclinical development for the identification of specific vectors that could be commercialized. Following identification, we have an option to obtain a non-exclusive worldwide license under the licensed intellectual property to a single specified AAV vector to make, have made, use, import, sell and offer for sale licensed products using the selected vector, which can be exercised for each of ALS, Friedreich's ataxia, or Huntington's disease.

Under the terms of this license agreement, we paid REGENX an upfront fee of $500,000 and are required to make an annual maintenance fee in the five digits. If we exercise any or all of the commercial options by a specified date, we will be required to make upfront payments to REGENX of up to $1.5 million and to pay to REGENX an annual maintenance fee payment ranging from five digits to six digits depending on the number of disease indication options exercised. In addition, we will be required to pay to RENGENX up to $5.0 million in milestone fees per disease indication, low- to mid-single digit royalty percentages on net sales of licensed products, and low- to mid-single digit percentages of any sublicense fees that we receive from sublicensees for the licensed intellectual property rights.

We are also entitled to extend the duration of the commercial option a limited number of times for each disease indication upon payment of a fee in the low-six digits to REGENX.

Our license agreement with REGENX will expire upon the expiration, lapse, abandonment, or invalidation of the last claim of the licensed intellectual property to expire, lapse, or become abandoned or unenforceable in all the countries of the world. The license agreement will automatically terminate if we do not exercise any commercial options within a specified time period after entering into the license agreement, which may be extended. We may terminate the license agreement upon a specified number of days prior written notice. REGENX may terminate the license agreement if we, our affiliates, or sublicensees experience insolvency, if we are more than a specified number of days late in paying money due under the license agreement, or, effective immediately, if we or our affiliates commence any action against REGENX or its licensors to declare or render any claim of the licensed patent rights invalid or unenforceable. Either party may terminate the license agreement for material breach that is not cured within a specified number of days.

Competition

The biopharmaceutical industry is characterized by intense and dynamic competition to develop new technologies and proprietary therapies. Any product candidates that we successfully develop into products and commercialize may compete with existing therapies and new therapies that may become available in the future. While we believe that our product engine, product programs, product candidates and scientific expertise in the fields of gene therapy and neuroscience provide us with competitive advantages, we face potential competition from various sources, including larger and better-funded pharmaceutical, specialty pharmaceutical and biotechnology companies, as well as from academic institutions, governmental agencies and public and private research institutions.

We are aware of several companies focused on developing gene therapies in various indications, including bluebird bio, Inc., Applied Genetic Technologies Corporation, Asklepios BioPharmaceutical, Inc., Audentes Therapeutics, Inc., Avalanche Biotechnologies, Inc., Dimension Therapeutics, Inc., GenSight Biologies SA, NightstaRx Ltd, REGENX, uniQure and Spark Therapeutics, Inc. as well as several companies addressing other methods for modifying genes and regulating gene expression. Any advances in gene therapy technology made by a competitor may be used to develop therapies that could compete against any of our product candidates.

We expect that VY-AADC01 will compete with a variety of therapies currently marketed and in development for advanced Parkinson's disease, including DBS marked by Medtronic plc, St. Jude Medical, Inc. and other medical device companies, DUOPA/Duodopa marketed by AbbVie Inc., as well as potentially AMT-090 or AAV-GDNF in development at uniQure NV, or uniQure, OXB-102/Prosavin in development at Oxford Biomedica plc, and ND0612H in development at NeuroDerm Ltd.

We expect that our other preclinical programs will compete with a variety of therapies in development, including:

- VY-SOD101 for a monogenic form of ALS will potentially compete with ISIS 333611 being developed by Isis Pharmaceuticals, Inc., or Isis, in collaboration with Biogen Idec., or Biogen and Tirasemtiv being developed by Cytokinetics, Inc., or Cytokinetics;

- VY-FXN01 for Friedreich's ataxia will potentially compete with RG2833 being developed by BioMarin Pharmaceutical Inc., AAV-FXN being developed by AAVLife, and frataxin targeted gene therapy being developed by Agilis Biotherapeutics, LLC in collaboration with Intrexon Corporation and BB-FA being developed by BioBlast Pharma Ltd., or BioBlast;

- VY-HTT01 for Huntington's disease will potentially compete with ISIS-HTTRx being developed by Isis in collaboration with F. Hoffman-La Roche Ltd., or Roche, gene editing approach being developed by Sangamo Biosciences, Inc. in collaboration with Shire plc, and another gene therapy being developed by uniQure; and

- VY-SMN101 for spinal muscular atrophy will potentially compete with ChariSMA being developed by AveXis Inc., ISIS-SMN_{RX} being developed by Isis and Biogen, LMI-070 being developed by Novartis AC, RO6885247 being developed by PTC Therapeutics, Inc. and Roche, BBrm1 being developed by BioBlast and CK-2127107 being developed by Cytokinetics in collaboration with Astellas Pharma US, Inc.

In addition, companies that are currently engaged in gene therapy for non-CNS diseases could at any time decide to develop gene therapies for CNS diseases.

Many of our competitors, either alone or with their strategic partners, have substantially greater financial, technical and human resources than we do and significantly greater experience in the discovery and development of product candidates, obtaining FDA and other regulatory approvals of product candidates and commercializing those product candidates. Accordingly, our competitors may be more successful than us in obtaining approval for product candidates and achieving widespread market acceptance. Our competitors' product candidates may be more effective, or more effectively marketed and sold, than any product candidate we may commercialize and may render our treatments obsolete or non-competitive before we can recover the expenses of developing and commercializing any of our product candidates.

Mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated among a smaller number of our competitors. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and subject registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs. Smaller or early-stage companies may

also prove to be significant competitors, particularly through collaborative arrangements with large and established companies.

We anticipate that we will face intense and increasing competition as new product candidates enter the market and advanced technologies become available. We expect any product candidates that we develop and commercialize to compete on the basis of, among other things, efficacy, safety, convenience of administration and delivery, price, and the availability of reimbursement from government and other third-party payers.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we may develop. Our competitors also may obtain FDA or other regulatory approval for their product candidates more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market.

Intellectual Property

Overview

We strive to protect the proprietary technology, inventions, and to enhance improvements that are commercially important to the development of our business, including seeking, maintaining, and defending patent rights, whether developed internally or licensed from third parties. We also rely on trade secrets and know-how relating to our proprietary technology platform, on continuing technological innovation and on in-licensing opportunities to develop, strengthen and maintain the strength of our position in the field of gene therapy that may be important for the development of our business. We additionally may rely on regulatory protection afforded through data exclusivity, market exclusivity and patent term extensions where available.

Our commercial success may depend in part on our ability to: obtain and maintain patent and other protections for commercially important technology, inventions and know-how related to our business; defend and enforce our patents; preserve the confidentiality of our trade secrets; and operate without infringing the valid enforceable patents and intellectual property rights of third parties. Our ability to stop third parties from making, having made, using, selling, offering to sell or importing our products may depend on the extent to which we have rights under valid and enforceable licenses, patents or trade secrets that cover these activities. In some cases, these rights may need to be enforced by third party licensors. With respect to both licensed and company-owned intellectual property, we cannot be sure that patents will be granted with respect to any of our pending patent applications or with respect to any patent applications filed by us in the future, nor can we be sure that any of our existing patents or any patents that may be granted to us in the future will be commercially useful in protecting our commercial products and methods of manufacturing the same.

We have 12 patent applications pending in the United States and foreign jurisdictions. At least 18 patent applications have been filed and are pending in the United States and foreign jurisdictions by or on behalf of universities which have granted us exclusive license rights to the technology. To date, 23 patents have issued to our licensors which have granted us exclusive license rights to the technology. To date, 25 patents have issued to our licensors which have granted us non-exclusive license rights to the technology with 10 applications pending. Our policy is to file patent applications to protect technology, inventions and improvements to inventions that are commercially important to the development of our business. We seek United States and international patent protection for a variety of technologies, including: research tools and methods, methods for transferring genetic material into cells, AAV-based biological products, methods of designing novel AAV constructs, methods for treating diseases of interest and methods for manufacturing our AAV-based products. We also intend to seek patent protection or rely upon trade secret rights to protect other technologies that may be used to discover and validate targets and that may be used to identify and develop novel biological products. We seek

protection, in part, through confidentiality and proprietary information agreements. We are a party to various other license agreements that give us rights to use specific technologies in our research and development.

Company-Owned Intellectual Property

We own a patent application directed to capsid engineering and domain swapping. This application is pending in the United States, and was filed internationally on June 9, 2015 in combination with our application directed to AAV production. Patents that grant from this patent family are generally expected to expire in 2035, subject to possible patent term extensions.

We own a patent application directed to AAV production. This application is pending in the United States, and was filed internationally on June 9, 2015 in combination with our application directed to capsid engineering and domain swapping. Patents that grant from this patent family are generally expected to expire in 2035, subject to possible patent term extensions.

We own two patent families of three patent applications directed to AAV constructs encoding the gene AADC for therapeutic uses. These applications are pending in the United States, and are due to convert at the earliest on November 5, 2015. Patents that grant from this patent family are generally expected to expire in 2035, subject to possible patent term extensions.

We own a patent application directed to targeting SOD1 for the treatment of ALS. This application is pending in the United States, and is due to convert November 14, 2015. Patents that grant from this patent family are generally expected to expire in 2035, subject to possible patent term extensions.

We own three patent applications directed to delivery of AAV gene therapies to the CNS. These applications are pending in the United States, and are due to convert January 16, 2016. Patents that grant from this patent family are generally expected to expire in 2036, subject to possible patent term extensions.

We own a patent application directed to the production of scAAV particles. This application is pending in the United States, and is due to convert December 12, 2015. Patents that grant from this patent family are generally expected to expire in 2035, subject to possible patent term extensions.

We own a patent application directed to the design of AAV drug delivery cassettes. This application is pending in the United States, and is due to convert November 14, 2015. Patents that grant from this patent family are generally expected to expire in 2035, subject to possible patent term extensions.

We own a patent application directed to regulatable expression control of AAV transgenes. This application is pending in the United States, and is due to convert February 23, 2016. Patents that grant from this patent family are generally expected to expire in 2036, subject to possible patent term extensions.

We own two patent applications directed to AAVs encoding frataxin constructs for the treatment of Friedreich's Ataxia. This application is pending in the United States, and is due to convert April 24, 2016. Patents that grant from this patent family are generally expected to expire in 2036, subject to possible patent term extensions.

Licensed Intellectual Property

We have obtained exclusive licenses and non-exclusive licenses to patents directed to both compositions of matter and methods of use.

We have exclusively licensed six families of patents and patent applications directed to RNAi constructs as vector payloads, their design and use in the treatment of CNS disorders from the University of Massachusetts. This family of patents and applications is pending and/or granted in the

United States and other territories and comprises 35 granted patents and 16 applications. Patents have been granted in the United States, Canada, Europe, Israel, Japan, Korea and Australia. Nationalization for some members has taken place in Germany, Spain, France, Great Britain Italy, and Sweden. Patents that grant from these patent families are generally expected to expire between 2022 and 2025, subject to possible patent term extensions.

We have exclusively licensed three families of patents and patent applications directed to novel AAV capsids from the University of Massachusetts. These families of patents and applications, pending and/or granted in the United States, comprise of one granted patent and eight applications. The single patent was granted in the United States. Patents that grant from these patent families are generally expected to expire between 2030 and 2035, subject to possible patent term extensions.

We have non-exclusively licensed a patent family directed to production methods for AAV in insect cells from the NIH, U.S. Department of Health and Human Services. This family of patents is granted in the United States, Canada, Australia and Europe and further nationalized in Germany, France and Great Britain and comprises eight granted patents. Patents that grant from this patent family are generally expected to expire in 2022, subject to possible patent term extensions.

We have licensed two families of patents and patent applications directed to novel AAV capsids from the Board of Trustees of the Leland Stanford Junior University. These families of patents and applications, pending and/or granted in the United States, comprise of four granted patents and four applications. Patents that grant from these patent families are generally expected to expire between 2027 and 2032, subject to possible patent term extensions.

Trademark Protection

We have filed and obtained trademark protection for the VOYAGER THERAPEUTICS character mark for pharmaceutical research and development in the field of gene therapy. The mark is listed on the Principle Register, Registration No. 454283.

We have filed and obtained trademark protection for the VOYAGER THERAPEUTICS service mark logo for pharmaceutical research and development in the field of gene therapy. The mark is listed on the Principle Register, Registration No. 4621083.

We plan to register trademarks in connection with our biological products.

In addition to the above, we have established expertise and development capabilities focused in the areas of preclinical research and development, manufacturing and manufacturing process scale-up, quality control, quality assurance, regulatory affairs and clinical trial design and implementation. We believe that our focus and expertise will help us develop products based on our proprietary intellectual property.

Trade Secret Protection

Finally, we may rely, in some circumstances, on trade secrets to protect our technology. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with our employees, consultants, scientific advisors and contractors. We also seek to preserve the integrity and confidentiality of our data and trade secrets by maintaining physical security of our premises and physical and electronic security of our information technology systems. While we have confidence in these individuals, organizations and systems, agreements or security measures may be breached, and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors. To the extent that our consultants, contractors or collaborators use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

Government Regulation

Biological products, including gene therapy products, are subject to regulation under the Federal Food, Drug, and Cosmetic Act, or FD&C Act, and the Public Health Service Act, or PHS Act, and other federal, state, local and foreign statutes and regulations. Both the FD&C Act and the PHS Act and their corresponding regulations govern, among other things, the testing, manufacturing, safety, purity, potency, efficacy, labeling, packaging, storage, record keeping, distribution, import, export, reporting, advertising and other promotional practices involving biological products. FDA approval must be obtained before clinical testing of biological products, and each clinical study protocol for a gene therapy product is reviewed by the FDA and, in some instances, the NIH, through its RAC. FDA approval also must be obtained before marketing of biological products. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources and we may not be able to obtain the required regulatory approvals.

Within the FDA, the Center for Biologics Evaluation and Research, or CBER, regulates gene therapy products. CBER works closely with the NIH and its RAC, which makes recommendations to the NIH on gene therapy issues and engages in a public discussion of scientific, safety, ethical and societal issues related to proposed and ongoing gene therapy protocols. The FDA and the NIH have published guidance documents with respect to the development and submission of gene therapy protocols. The FDA also has published guidance documents related to, among other things, gene therapy products in general, their preclinical assessment, observing subjects involved in gene therapy studies for delayed adverse events, viral shedding, environmental assessments, potency testing, and chemistry, manufacturing and control information in gene therapy INDs. FDA guidance documents provide the agency's current thinking about a particular subject, but are not legally binding.

U.S. Biological Products Development Process

The process required by the FDA before a biological product may be marketed in the United States generally involves the following:

- completion of nonclinical laboratory tests and animal studies according to good laboratory practice, or GLPs, and applicable requirements for the humane use of laboratory animals or other applicable regulations;
- submission to the FDA of an application for an IND, which must become effective before human clinical trials may begin;
- performance of adequate and well-controlled human clinical trials according to the FDA's regulations commonly referred to as good clinical practice, or GCPs, and any additional requirements for the protection of human research subjects and their health information, to establish the safety and efficacy of the proposed biological product for its intended use;
- submission to the FDA of a Biologics License Application, or BLA, for marketing approval that includes substantive evidence of safety, purity, and potency from results of nonclinical testing and clinical trials;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities where the biological product is produced to assess compliance with cGMP, to assure that the facilities, methods and controls are adequate to preserve the biological product's identity, strength, quality and purity;
- potential FDA audit of the nonclinical and clinical study sites that generated the data in support of the BLA; and
- FDA review and approval, or licensure, of the BLA.

Before testing any biological product candidate, including a gene therapy product, in humans, the product candidate enters the preclinical testing stage. Preclinical tests, also referred to as nonclinical trials, include laboratory evaluations of product chemistry, toxicity and formulation, as well as animal studies to assess the potential safety and activity of the product candidate. The conduct of the preclinical tests must comply with federal regulations and requirements including GLPs.

Where a gene therapy study is conducted at, or sponsored by, institutions receiving NIH funding for recombinant DNA research, prior to the submission of an IND to the FDA, a protocol and related documentation is submitted to and the study is registered with the NIH Office of Biotechnology Activities, or OBA, pursuant to the NIH Guidelines for Research Involving Recombinant DNA Molecules, or NIH Guidelines. Compliance with the NIH Guidelines is mandatory for investigators at institutions receiving NIH funds for research involving recombinant DNA, however many companies and other institutions not otherwise subject to the NIH Guidelines voluntarily follow them. The NIH is responsible for convening the RAC, a federal advisory committee, that discusses protocols that raise novel or particularly important scientific, safety or ethical considerations at one of its quarterly public meetings. The OBA will notify the FDA of the RAC's decision regarding the necessity for full public review of a gene therapy protocol. RAC proceedings and reports are posted to the OBA website and may be accessed by the public.

The clinical study sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and a proposed clinical protocol, to the FDA as part of the IND. Some preclinical testing typically continues after the IND is submitted. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA places the clinical study on a clinical hold within that 30-day time period. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical study can begin. With gene therapy protocols, if the FDA allows the IND to proceed, but the RAC decides that full public review of the protocol is warranted, the FDA will request at the completion of its IND review that sponsors delay initiation of the protocol until after completion of the RAC review process. The FDA may also impose clinical holds on a biological product candidate at any time before or during clinical trials due to safety concerns or non-compliance. If the FDA imposes a clinical hold, studies may not recommence without FDA authorization and then only under terms authorized by the FDA. Accordingly, we cannot be sure that submission of an IND will result in the FDA allowing clinical trials to begin, or that, once begun, issues will not arise that suspend or terminate such studies.

Clinical trials involve the administration of the biological product candidate to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the study sponsor's control. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical study, dosing procedures, subject selection and exclusion criteria, and the parameters to be used to monitor subject safety, including stopping rules that assure a clinical study will be stopped if certain adverse events should occur. Each protocol and any amendments to the protocol must be submitted to the FDA as part of the IND. Clinical trials must be conducted and monitored in accordance with the FDA's regulations comprising the GCP requirements, including the requirement that all research subjects provide informed consent. Further, each clinical study must be reviewed and approved by an independent institutional review board, or IRB, at or servicing each institution at which the clinical study will be conducted. An IRB is charged with protecting the welfare and rights of study participants and considers such items as whether the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the form and content of the informed consent that must be signed by each clinical study subject or his or her legal representative and must monitor the clinical study until completed. Clinical trials involving recombinant or synthetic (or both) nucleic acid molecules performed at or sponsored by an institution that receives any NIH funding for such research also must be reviewed by an institutional biosafety committee, or IBC, a local institutional committee that reviews

and oversees basic and clinical research conducted at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment.

Human clinical trials are typically conducted in three sequential phases that may overlap or be combined:

- *Phase 1.* The biological product is initially introduced into healthy human subjects and tested for safety. In the case of some products for severe or life-threatening diseases, especially when the product may be too inherently toxic to ethically administer to healthy volunteers, the initial human testing is often conducted in patients.

- *Phase 2.* The biological product is evaluated in a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance, optimal dosage and dosing schedule.

- *Phase 3.* Clinical trials are undertaken to further evaluate dosage, clinical efficacy, potency and safety in an expanded patient population at geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the product and provide an adequate basis for product labeling.

Post-approval clinical trials, sometimes referred to as Phase 4 clinical trials, may be conducted after initial marketing approval. These clinical trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication, particularly for long-term safety follow-up. The FDA recommends that sponsors observe subjects for potential gene therapy-related delayed adverse events for a 15-year period, including a minimum of five years of annual examinations followed by ten years of annual queries, either in person or by questionnaire, of trial subjects.

During all phases of clinical development, regulatory agencies require extensive monitoring and auditing of all clinical activities, clinical data, and clinical trial investigators. Annual progress reports detailing the results of the clinical trials must be submitted to the FDA. Written IND safety reports must be promptly submitted to the FDA, the NIH and the investigators for serious and unexpected adverse events, any findings from other studies, tests in laboratory animals or in vitro testing that suggest a significant risk for human subjects, or any clinically important increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure. The sponsor must submit an IND safety report within 15 calendar days after the sponsor determines that the information qualifies for reporting. The sponsor also must notify the FDA of any unexpected fatal or life-threatening suspected adverse reaction within seven calendar days after the sponsor's initial receipt of the information. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor or its data safety monitoring board may suspend a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the biological product has been associated with unexpected serious harm to patients.

Human gene therapy products are a new category of therapeutics. Because this is a relatively new and expanding area of novel therapeutic interventions, there can be no assurance as to the length of the study period, the number of patients the FDA will require to be enrolled in the studies in order to establish the safety, efficacy, purity and potency of human gene therapy products, or that the data generated in these studies will be acceptable to the FDA to support marketing approval. The NIH and the FDA have a publicly accessible database, the Genetic Modification Clinical Research Information System which includes information on gene transfer studies and serves as an electronic tool to facilitate the reporting and analysis of adverse events on these studies.

Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the physical characteristics of the biological product as well as

finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. To help reduce the risk of the introduction of adventitious agents with use of biological products, the Public Health Service Act, or PHS Act, emphasizes the importance of manufacturing control for products whose attributes cannot be precisely defined. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, the sponsor must develop methods for testing the identity, strength, quality, potency and purity of the final biological product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the biological product candidate does not undergo unacceptable deterioration over its shelf life.

U.S. Review and Approval Processes

After the completion of clinical trials of a biological product, FDA approval of a BLA, must be obtained before commercial marketing of the biological product. The BLA must include results of product development, laboratory and animal studies, human studies, information on the manufacture and composition of the product, proposed labeling and other relevant information. In addition, under the Pediatric Research Equity Act, or PREA, a BLA or supplement to a BLA must contain data to assess the safety and effectiveness of the biological product for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The FDA may grant deferrals for submission of data or full or partial waivers. Unless otherwise required by regulation, PREA does not apply to any biological product for an indication for which orphan designation has been granted. The testing and approval processes require substantial time and effort and there can be no assurance that the FDA will accept the BLA for filing and, even if filed, that any approval will be granted on a timely basis, if at all.

Under the Prescription Drug User Fee Act, or PDUFA, as amended, each BLA must be accompanied by a user fee. The FDA adjusts the PDUFA user fees on an annual basis. PDUFA also imposes an annual product fee for biologics and an annual establishment fee on facilities used to manufacture prescription biologics. Fee waivers or reductions are available in certain circumstances, including a waiver of the application fee for the first application filed by a small business. Additionally, no user fees are assessed on BLAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

Within 60 days following submission of the application, the FDA reviews a BLA submitted to determine if it is substantially complete before the agency accepts it for filing. The FDA may refuse to file any BLA that it deems incomplete or not properly reviewable at the time of submission and may request additional information. In this event, the BLA must be resubmitted with the additional information. The resubmitted application also is subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth substantive review of the BLA. The FDA reviews the BLA to determine, among other things, whether the proposed product is safe and potent, or effective, for its intended use, and has an acceptable purity profile, and whether the product is being manufactured in accordance with cGMP to assure and preserve the product's identity, safety, strength, quality, potency and purity. The FDA may refer applications for novel biological products or biological products that present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions. During the biological product approval process, the FDA also will determine whether a Risk Evaluation and Mitigation Strategy, or REMS, is necessary to assure the safe use of the biological product. If the FDA concludes a REMS is needed, the sponsor of the BLA must submit a proposed REMS; the FDA will not approve the BLA without a REMS, if required.

Before approving a BLA, the FDA will inspect the facilities at which the product is manufactured. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving a BLA, the FDA will typically inspect one or more clinical trial sites to assure that the clinical trials were conducted in compliance with IND study requirements and GCP requirements. To assure cGMP and GCP compliance, an applicant must incur significant expenditure of time, money and effort in the areas of training, record keeping, production, and quality control.

Notwithstanding the submission of relevant data and information, the FDA may ultimately decide that the BLA does not satisfy its regulatory criteria for approval and deny approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data. If the agency decides not to approve the BLA in its present form, the FDA will issue a complete response letter that usually describes all of the specific deficiencies in the BLA identified by the FDA. The deficiencies identified may be minor, for example, requiring labeling changes, or major, for example, requiring additional clinical trials. Additionally, the complete response letter may include recommended actions that the applicant might take to place the application in a condition for approval. If a complete response letter is issued, the applicant may either resubmit the BLA, addressing all of the deficiencies identified in the letter, or withdraw the application.

If a product receives regulatory approval, the approval may be significantly limited to specific diseases and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product. Further, the FDA may require that certain contraindications, warnings or precautions be included in the product labeling. The FDA may impose restrictions and conditions on product distribution, prescribing, or dispensing in the form of a risk management plan, or otherwise limit the scope of any approval. In addition, the FDA may require post marketing clinical trials, sometimes referred to as Phase 4 clinical trials, designed to further assess a biological product's safety and effectiveness, and testing and surveillance programs to monitor the safety of approved products that have been commercialized.

One of the performance goals agreed to by the FDA under the PDUFA is to review standard BLAs in 10 months from filing and priority BLAs in six months from filing, whereupon a review decision is to be made. The FDA does not always meet its PDUFA goal dates for standard and priority BLAs and its review goals are subject to change from time to time. The review process and the PDUFA goal date may be extended by three months if the FDA requests or the BLA sponsor otherwise provides additional information or clarification regarding information already provided in the submission within the last three months before the PDUFA goal date.

Post-Approval Requirements

Maintaining substantial compliance with applicable federal, state, and local statutes and regulations requires the expenditure of substantial time and financial resources. Rigorous and extensive FDA regulation of biological products continues after approval, particularly with respect to cGMP. We will rely, and expect to continue to rely, on third parties for the production of clinical and commercial quantities of any products that we may commercialize. Manufacturers of our products are required to comply with applicable requirements in the cGMP regulations, including quality control and quality assurance and maintenance of records and documentation. Other post-approval requirements applicable to biological products, include reporting of cGMP deviations that may affect the identity, potency, purity and overall safety of a distributed product, record-keeping requirements, reporting of adverse effects, reporting updated safety and efficacy information, and complying with electronic record and signature requirements. After a BLA is approved, the product also may be subject to official lot release. As part of the manufacturing process, the manufacturer is required to perform certain tests on each lot of the product before it is released for distribution. If the product is subject to official release

by the FDA, the manufacturer submits samples of each lot of product to the FDA together with a release protocol showing a summary of the history of manufacture of the lot and the results of all of the manufacturer's tests performed on the lot. The FDA also may perform certain confirmatory tests on lots of some products, such as viral vaccines, before releasing the lots for distribution by the manufacturer. In addition, the FDA conducts laboratory research related to the regulatory standards on the safety, purity, potency, and effectiveness of biological products.

We also must comply with the FDA's advertising and promotion requirements, such as those related to direct-to-consumer advertising, the prohibition on promoting products for uses or in patient populations that are not described in the product's approved labeling (known as "off-label use"), industry-sponsored scientific and educational activities, and promotional activities involving the internet. Discovery of previously unknown problems or the failure to comply with the applicable regulatory requirements may result in restrictions on the marketing of a product or withdrawal of the product from the market as well as possible civil or criminal sanctions. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval, may subject an applicant or manufacturer to administrative or judicial civil or criminal sanctions and adverse publicity. FDA sanctions could include refusal to approve pending applications, withdrawal of an approval, clinical hold, warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, mandated corrective advertising or communications with doctors, debarment, restitution, disgorgement of profits, or civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

Biological product manufacturers and other entities involved in the manufacture and distribution of approved biological products are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMPs and other laws. Accordingly, manufacturers must continue to expend time, money, and effort in the area of production and quality control to maintain cGMP compliance. Discovery of problems with a product after approval may result in restrictions on a product, manufacturer, or holder of an approved BLA, including withdrawal of the product from the market. In addition, changes to the manufacturing process or facility generally require prior FDA approval before being implemented and other types of changes to the approved product, such as adding new indications and additional labeling claims, are also subject to further FDA review and approval.

Orphan Drug Designation

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biological product intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the United States, or more than 200,000 individuals in the United States and for which there is no reasonable expectation that the cost of developing and making a drug or biological product available in the United States for this type of disease or condition will be recovered from sales of the product. Orphan product designation must be requested before submitting a BLA. After the FDA grants orphan product designation, the identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. Orphan product designation does not convey any advantage in or shorten the duration of the regulatory review and approval process.

If a product that has orphan designation subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to orphan product exclusivity, which means that the FDA may not approve any other applications to market the same biological product for the same indication for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan exclusivity. Competitors, however, may receive approval of different products for the indication for which the orphan product has exclusivity or obtain approval for the same product but for a different indication for which the orphan product has

exclusivity. Orphan product exclusivity also could block the approval of one of our products for seven years if a competitor obtains approval of the same biological product as defined by the FDA or if our product candidate is determined to be contained within the competitor's product for the same indication or disease. If a biological product designated as an orphan product receives marketing approval for an indication broader than what is designated, it may not be entitled to orphan product exclusivity.

Special FDA Expedited Review and Approval Programs

The FDA has various programs, including fast track designation, accelerated approval, priority review and breakthrough therapy designation, that are intended to expedite or simplify the process for the development and FDA review of biological products that are intended for the treatment of serious or life threatening diseases or conditions and demonstrate the potential to address unmet medical needs. The purpose of these programs is to provide important new biological products to patients earlier than under standard FDA review procedures. To be eligible for a fast track designation, the FDA must determine, based on the request of a sponsor, that a biological product is intended to treat a serious or life threatening disease or condition and demonstrates the potential to address an unmet medical need. The FDA will determine that a product will fill an unmet medical need if it will provide a therapy where none exists or provide a therapy that may be potentially superior to existing therapy based on efficacy or safety factors.

The FDA may give a priority review designation to biological products that offer major advances in treatment, or provide a treatment where no adequate therapy exists. A priority review means that the goal for the FDA to review an application is six months, rather than the standard review of ten months under current PDUFA guidelines. Most products that are eligible for fast track designation are also likely to be considered appropriate to receive a priority review.

In addition, biological products studied for their safety and effectiveness in treating serious or life-threatening illnesses and that provide meaningful therapeutic benefit over existing treatments may receive accelerated approval and may be approved on the basis of adequate and well-controlled clinical trials establishing that the biological product has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity or prevalence of the condition and the availability or lack of alternative treatments. As a condition of approval, the FDA may require a sponsor of a biological product receiving accelerated approval to perform post-marketing studies to verify and describe the predicted effect on irreversible morbidity or mortality or other clinical endpoint, and the biological product may be subject to accelerated withdrawal procedures.

Moreover, under the provisions of the new Food and Drug Administration Safety and Innovation Act, or FDASIA, enacted in 2012, a sponsor can request designation of a product candidate as a "breakthrough therapy." A breakthrough therapy is defined as a biological product that is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the biological product may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. Biological products designated as breakthrough therapies are also eligible for accelerated approval. The FDA must take certain actions, such as holding timely meetings and providing advice, intended to expedite the development and review of an application for approval of a breakthrough therapy.

Even if a product qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened. Furthermore, fast track designation, priority review, accelerated

approval and breakthrough therapy designation, do not change the standards for approval and may not ultimately expedite the development or approval process.

U.S. Patent Term Restoration and Marketing Exclusivity

Depending upon the timing, duration and specifics of the FDA approval of the use of our product candidates, some of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, commonly referred to as the Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit 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, patent term restoration cannot extend the remaining term of a patent beyond a total of 14 years from the product's approval date. The patent term restoration period is generally one-half the time between the effective date of an IND and the submission date of a BLA plus the time between the submission date of a BLA and the approval of that application. Only one patent applicable to an approved biological product is eligible for the extension and the application for the extension must be submitted prior to the expiration of the patent. The U.S. Patent and Trademark Office, in consultation with the FDA, reviews and approves the application for any patent term extension or restoration. In the future, we may intend to apply for restoration of patent term for one of our currently owned or licensed patents to add patent life beyond its current expiration date, depending on the expected length of the clinical trials and other factors involved in the filing of the relevant BLA.

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

The Patient Protection and Affordable Care Act, or Affordable Care Act, signed into law on March 23, 2010, includes a subtitle called the Biologics Price Competition and Innovation Act of 2009 which created an abbreviated approval pathway for biological products shown to be similar to, or interchangeable with, an FDA-licensed reference biological product. This amendment to the PHS Act attempts to minimize duplicative testing. Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity, and potency, can be shown through analytical studies, animal studies, and a clinical trial or trials, including clinical pharmacology trials and assessment of immunogenicity. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product and, for products administered multiple times, the biologic and the reference biologic may be switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic. However, complexities associated with the larger, and often more complex, structure of biological products, as well as the process by which such products are manufactured, pose significant hurdles to implementation that are still being worked out by the FDA.

A reference biologic is granted twelve years of exclusivity from the time of first licensure of the reference product. On February 4, 2015, President Obama released his proposed budget for fiscal year 2016 and proposed to cut this twelve-year period of exclusivity down to seven years. He also proposed to prohibit additional periods of exclusivity for brand biologics due to minor changes in product formulations, a practice often referred to as "evergreening." The first biologic product submitted under the abbreviated approval pathway that is determined to be interchangeable with the reference product has exclusivity against other biologics submitting under the abbreviated approval pathway for the lesser of (i) one year after the first commercial marketing, (ii) 18 months after approval if there is no legal challenge, (iii) 18 months after the resolution in the applicant's favor of a lawsuit challenging the

biologics' patents if an application has been submitted or (iv) 42 months after the application has been approved if a lawsuit is ongoing within the 42-month period.

Other Healthcare Laws

Although we currently do not have any products on the market, we may be subject to additional healthcare regulation and enforcement by the federal government and by authorities in the states in which we conduct our business. Such laws include, without limitation, state and federal anti-kickback, fraud and abuse, false claims, privacy and security and physician sunshine laws and regulations, many of which may become more applicable to us if our product candidates are approved and we begin commercialization. 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, administrative, civil and criminal penalties, damages, fines, disgorgement, the curtailment or restructuring of our operations, exclusion from participation in federal and state healthcare programs and imprisonment, any of which could adversely affect our ability to operate our business and our financial results.

In addition, the Affordable Care Act intended to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against fraud and abuse, add transparency requirements for the healthcare and health insurance industries, impose taxes and fees on the health industry and impose additional health policy reforms. With regard to biopharmaceutical products, in addition to the Biologics Price Competition and Innovation Act of 2009 included in the Affordable Care Act, among other things, the Affordable Care Act expanded and increased industry rebates for drugs covered under Medicaid programs and made changes to the coverage requirements under the Medicare prescription drug benefit. We continue to evaluate the effect that the Affordable Care Act has on our business. In the coming years, additional legislative and regulatory changes could be made to governmental health programs that could significantly impact the biopharmaceutical industry and the success of our product candidates. The Affordable Care Act, as well as other federal, state and foreign healthcare reform measures that have been and may be adopted in the future, could harm our future revenues.

Additional Regulation

In addition to the foregoing, state and federal laws regarding environmental protection and hazardous substances, including the Occupational Safety and Health Act, the Resource Conservancy and Recovery Act and the Toxic Substances Control Act, affect our business. These and other laws govern our use, handling and disposal of various biological, chemical and radioactive substances used in, and wastes generated by, our operations. If our operations result in contamination of the environment or expose individuals to hazardous substances, we could be liable for damages and governmental fines. We believe that we are in material compliance with applicable environmental laws and that continued compliance therewith will not have a material adverse effect on our business. We cannot predict, however, how changes in these laws may affect our future operations.

U.S. Foreign Corrupt Practices Act

The U.S. Foreign Corrupt Practices Act, to which we are subject, prohibits corporations and individuals from engaging in certain activities to obtain or retain business or to influence a person working in an official capacity. It is illegal to pay, offer to pay or authorize the payment of anything of value to any foreign government official, government staff member, political party or political candidate in an attempt to obtain or retain business or to otherwise influence a person working in an official capacity.

Government Regulation Outside of the United States

In addition to regulations in the United States, we will be subject to a variety of regulations in other jurisdictions governing, among other things, clinical trials and any commercial sales and distribution of our products. Because biologically sourced raw materials are subject to unique contamination risks, their use may be restricted in some countries.

Whether or not we obtain FDA approval for a product, we must obtain the requisite approvals from regulatory authorities in foreign countries prior to the commencement of clinical trials or marketing of the product in those countries. Certain countries outside of the United States have a similar process that requires the submission of a clinical trial application much like the IND prior to the commencement of human clinical trials.

If we fail to comply with applicable foreign regulatory requirements, we may be subject to, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution.

Coverage, Pricing and Reimbursement for Biopharmaceutical Products

Sales of our products, when and if approved for marketing, will depend, in part, on the extent to which our products will be covered by third-party payors, such as federal, state, and foreign government health care programs, commercial insurance and managed healthcare organizations. These third-party payors are increasingly reducing reimbursements for medical products, drugs and services. In addition, the U.S. government, state legislatures and foreign governments have continued implementing cost containment programs, including price controls, restrictions on coverage and reimbursement and requirements for substitution of generic products. Adoption of price controls and cost containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit our net revenue and results. Decreases in third-party reimbursement for our product candidates or a decision by a third-party payor not to cover our product candidates could reduce physician usage of our products once approved and have a material adverse effect on our sales, results of operations and financial condition.

Employees

As of June 1, 2015, we employed 31 full-time employees in the United States, including 26 in research and development and five in general and administrative. We have no part-time employees. Eighteen of our employees have either an M.D. or a Ph.D. We have never had a work stoppage, and none of our employees is represented by a labor organization or under any collective-bargaining arrangements. We consider our employee relations to be good.

Facilities

We lease our office and laboratory space, which consists of approximately 19,000 square feet located in Cambridge, Massachusetts. Our lease expires in 2019. We believe our current office and laboratory space is sufficient to meet our needs until the expiration of our lease.

Legal Proceedings

As of the date of this prospectus, we were not party to any legal matters or claims. In the future, we may become party to legal matters and claims arising in the ordinary course of business, the resolution of which we do not anticipate would have a material adverse impact on our financial position, results of operations or cash flows.

Executive Officers and Directors

The following table provides information regarding our executive officers and directors as of July 15, 2015:

Name	Age	Position(s)
Executive Officers:		
Steven M. Paul, M.D.	64	President, Chief Executive Officer and Director
Robert G. Pietrusko, Pharm.D.	67	Senior Vice President of Regulatory Affairs
Dinah Sah, Ph.D.	54	Senior Vice President of Neuroscience
J. Jeffrey Goater	39	Senior Vice President, Finance and Business Development
Robert Kotin, Ph.D.	59	Vice President of Production
Bernard Ravina, M.D.	48	Vice President of Clinical Development
Gregory R. Stewart, Ph.D.	56	Vice President of Drug Delivery
Non-Employee Directors:		
Mark Levin	64	Director; Chairman of the Board
Michael Higgins	53	Director
James A. Geraghty	60	Director
Perry Karsen	60	Director

(1) Member of the audit committee.

(2) Member of the compensation committee.

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

Each executive officer serves at the discretion of our board of directors and holds office until his or her successor is duly elected and qualified or until his or her earlier resignation or removal.

Executive Officers

Steven M. Paul, M.D. Dr. Paul has served as our President, Chief Executive Officer and member of our board of directors since September 2014. From June 2013 to September 2014 Dr. Paul served as our Interim President of Research and Development. Since September 2010, he has also served as a Venture Partner at Third Rock Ventures, LLC, or Third Rock Ventures, a life sciences venture capital firm focused on the formation, development and strategy of new companies. Additionally, Dr. Paul has served as a professor or an adjunct professor of neuroscience at Weill Cornell Medical College since August 2010. Prior to that, from 1993 to 2010, Dr. Paul held several key positions at Eli Lilly and Company (NYSE: LLY), or Eli Lilly, including Executive Vice President, President of Lilly Research Laboratories, Vice President of Neuroscience (CNS) Research and Group Vice President of Discovery Research. Prior to Eli Lilly, from 1988 to 1993, Dr. Paul served as the Scientific Director of the National Institute of Mental Health, or NIMH. Dr. Paul also served as Medical Director in the Commissioned Corps of the United States Public Health Service. Dr. Paul is an elected fellow of the American Association for the Advancement of Science and a member of the National Academy of Medicine. He is also currently on the board of directors of Sigma-Aldrich Corporation (NASDAQ: SIAL), Alnylam Pharmaceuticals, Inc. (NASDAQ: ALNY), Sage Therapeutics, Inc. (NASDAQ: SAGE) and the Foundation for the National Institute of Health, or NIH. Dr. Paul has also served as a member of the Advisory Counsel of the National Institute of General Medical Sciences and was appointed by the Secretary of the Department of Health and Human Services as a member of the advisory committee to the Director of the NIH from 2001 to 2006. Dr. Paul is also board certified by the American Board of Psychiatry and Neurology. Dr. Paul received a B.A. in Biology and Psychology from

Tulane University, and an M.S. and M.D. from the Tulane University School of Medicine. Dr. Paul's qualifications to sit on our board of directors include his extensive career in neuroscience and his leadership and managerial experiences at various pharmaceutical and biotechnology companies and healthcare organizations.

Robert G. Pietrusko, Pharm.D. Dr. Pietrusko has served as our Senior Vice President of Regulatory Affairs since June 2014. Prior to joining us, Dr. Pietrusko served as the Vice President of Global Regulatory Affairs & Quality and Executive Officer at ViroPharma, Inc. from April 2007 to January 2014. From 2003 to 2007, Dr. Pietrusko served as Senior Vice President of Regulatory Affairs and from 2001 to 2003 as Vice President of Worldwide Regulatory Affairs and Pharmacovigilance at Millennium Pharmaceuticals, Inc. From 1999 to 2000, he was the Vice President of Regulatory Affairs at SmithKline Beecham plc (now GlaxoSmithKline (NYSE: GSK)). Dr. Pietrusko received both a B.S. in Biology and a B.Pharm. from Rutgers University and received a Pharm.D. from the Philadelphia College of Pharmacy and Science. He completed his residency training in Hospital Pharmacy at Thomas Jefferson University Hospital.

Dinah Sah., Ph.D. Dr. Sah has served as our Senior Vice President of Neuroscience since March 2014. Prior to joining us, Dr. Sah served as a biotechnology research and development consultant from February 2012 to March 2014. Prior to that, Dr. Sah held several positions at Alnylam Pharmaceuticals, Inc. (NASDAQ: ALNY), including Vice President of Research from 2010 to 2012, Vice President of Research, CNS and Oncology from 2008 to 2010 and Senior Director of Research from 2005 to 2008. From 1999 to 2005 she worked at Biogen Idec, Inc. (NASDAQ: BIIB), most recently as Associate Director & Head of Neurobiology. Prior to that, Dr. Sah served as the Associate Director of Neurobiology at Signal Pharmaceuticals from 1997 to 1999. Dr. Sah received a B.S. in Biology from the Massachusetts Institute of Technology, a Ph.D. in Neurobiology from Harvard University and completed her post-doctoral training at Harvard University's Department of Neurobiology.

J. Jeffrey Goater. Mr. Goater has served as our Senior Vice President, Finance & Business Development since April 2015 and as our Vice President of Business Development from September 2013 to April 2015. Prior to joining us, Mr. Goater was Vice President of Business Development at Synageva BioPharma Corp. (NASDAQ: GEVA) from April 2013 to July 2013, and before that, he worked as an investment banker at Evercore Partners, Inc. (NYSE: EVR) from April 2008 to March 2013, most recently as Managing Director. Prior to that, Mr. Goater worked as an equity research analyst at Cowen and Company, LLC (NASDAQ: COWN), covering the biopharmaceutical sector, from 2004 to 2008. He also currently serves on the board of directors of Vaccinex, Inc. Mr. Goater received a B.A. in Biology, an M.S. in Pathology and Molecular Medicine, an M.S. in Microbiology and Immunology and an M.B.A., all from the University of Rochester.

Robert Kotin, Ph.D. Dr. Kotin has served as our Vice President of Production since February 2014. Prior to joining us, he held several positions at the National Heart, Lung and Blood Institute of the NIH, where he served from 1994 to January 2014, most recently as Senior Investigator and Laboratory Chief. Prior to that, Dr. Kotin served as head of the AAV gene therapy program at Genetic Therapy, Inc. from 1992 to 1994 and as Senior Research Scientist of the Medical Research Division at Lederle Laboratories from 1990 to 1992. Dr. Kotin received a B.A. in Biology from the University of California, Santa Cruz and a Ph.D. in Microbiology from Rutgers University and the University of Medicine and Dentistry of New Jersey.

Bernard Ravina, M.D. Dr. Ravina has served as our Vice President of Clinical Development since March 2014. Prior to joining us, Dr. Ravina was the Medical Director in Clinical Development at Biogen Idec (NASDAQ: BIIB) from October 2010 to March 2014, where he worked on both small molecule drugs and biologics for the treatment of neurological disorders and was responsible for biomarker and clinical development plans in Parkinson's disease, stroke and neuropathic pain. Prior to

that, Dr. Ravina was an Associate Professor of Neurology, Director of the Movement and Inherited Neurological Disorders Unit and Associate Chair of Neurology at the University of Rochester School of Medicine from August 2005 to October 2010. Dr. Ravina received an M.D. from Johns Hopkins University School of Medicine and a Masters in Clinical Epidemiology and Biostatistics from the University of Pennsylvania. He completed his residency training in Neurology and a fellowship in Parkinson's disease and movement disorders at the Hospital of the University of Pennsylvania.

Gregory R. Stewart, Ph.D. Dr. Stewart has served as our Vice President of Drug Delivery since November 2014. Prior to joining us, he served as Director of CNS Drug Therapy at Medtronic Neuromodulation from July 2004 to May 2012. Prior to that, Dr. Stewart served as the Director of Neuroscience at Genzyme Corporation, or Genzyme, a Sanofi company (NYSE: SNY) from 1997 to 2004. Prior to that, he served as a Staff Researcher-Neurobiology at Roche Bioscience (SIX: ROG)/Syntex Discovery Research from 1991 to 1996. Dr. Stewart received a B.S. in Neuroscience from Texas Christian University and a Ph.D. in Neural Sciences from Washington University in St. Louis. As a postgraduate, he was a Staff Fellow at the NIMH.

Non-Employee Directors

Mark Levin. Mr. Levin has served as Chairman of our board of directors since June 2013. Mr. Levin currently serves as a partner at Third Rock Ventures, which he co-founded in 2007. Mr. Levin served as founding Chief Executive Officer of Millennium Pharmaceuticals, Inc. from 1993 to 2005. Additionally, Mr. Levin was the co-founder of the life sciences effort of the Mayfield Fund, a global venture capital firm, where he was also the founding Chief Executive Officer of Cell Genesys, Inc. from 1989 to 1991, Tularik Inc. from 1991 to 1992, Focal, Inc. from 1992 to 1993, and StemCells, Inc. (NASDAQ: STEM) from 1990 to 1992. Mr. Levin started his career as a process engineer and project leader at Eli Lilly and Genentech. Mr. Levin received both a B.S. and M.S. in Chemical and Biochemical Engineering from Washington University. We believe Mr. Levin's experience working with and serving on the boards of directors of life sciences companies and his experience working in the venture capital industry qualifies him to serve on our board of directors.

Michael Higgins. Mr. Higgins has served as a member of our board of directors since July 2015. In January 2015, Mr. Higgins joined Polaris Partners as an entrepreneur-in-residence. Prior to joining Polaris Venture Partners, Mr. Higgins served as Chief Operating Officer and Chief Financial Officer at Ironwood Pharmaceuticals, Inc. (NASDAQ: IRWD) from 2003 through December 2014. Prior to his work at Ironwood, from 1997 through 2003, Mr. Higgins worked at Genzyme Corporation in a variety of leadership roles including Vice President, Corporate Finance and Vice President, Business Development. While at Genzyme, he was involved with multiple businesses including the Cell Therapy, Gene Therapy, and Orphan Disease business units. Previously, Mr. Higgins served as Chief Financial Officer of Procept, Inc., from 1992 to 1997. He also serves on the board of directors of Genocea Biosciences, Inc. (NASDAQ: GNCA) and Pulmatrix, Inc. (NASDAQ: PULM). Mr. Higgins began his pharmaceutical career as a sales representative for Schering-Plough Corporation in 1986. Mr. Higgins earned his Bachelor of Science degree from Cornell University and holds a Masters in Business Administration from the Amos Tuck School of Business at Dartmouth College. We believe Mr. Higgins' financial and business expertise, including his diversified background as an executive officer in public pharmaceutical companies, qualifies him to serve as a member of our board of directors.

James A. Geraghty. Mr. Geraghty has been a member of the board of directors since January 2014. He has served as Chairman of the board of directors of Idera Pharmaceuticals, Inc. since July 2013, and also serves as a member of the board of directors of Juniper Pharmaceuticals, Inc. He has served as an Entrepreneur-in-Residence at Third Rock Ventures since 2013. Previously, Mr. Geraghty served as Senior Vice President, North America Strategy and Business Development at Sanofi S.A. from February 2011 to October 2013. Prior to that, Mr. Geraghty held many roles at Genzyme from 1992 to

2011, most recently as Senior Vice President of International Development and an executive officer. While at Genzyme, his roles included President of Genzyme Europe and General Manager of Genzyme's cardiovascular business. He also served as Chairman of the board of directors, President and Chief Executive Officer of GTC Biotherapeutics, Inc. (formerly Genzyme Transgenics Corporation) from 1993 to 2007. Mr. Geraghty received a B.A. in Psychology and English from Georgetown University, an M.S. in Clinical Psychology from the University of Pennsylvania, and a J.D. from Yale Law School. We believe Mr. Geraghty's experience as a senior executive and service on the boards of other life sciences companies qualifies him to serve on our board of directors.

Perry Karsen. Mr. Karsen has served as a member of our board of directors since July 2015. Mr. Karsen currently serves as the Chief Executive Officer of the Celgene Cellular Therapeutics division of Celgene Corporation (NASDAQ: CELG), a publicly traded global biopharmaceutical company. Mr. Karsen served as Chief Operations Officer and Executive Vice President of Celgene from July 2010 to May 2013, and as senior vice president and head of worldwide business development of Celgene from 2004 to 2009. Between February 2009 and July 2010, Mr. Karsen was Chief Executive Officer of Pearl Therapeutics Inc., a privately held biotechnology company subsequently acquired by AstraZeneca plc (NYSE: AZN). Prior to his tenure with Celgene, Mr. Karsen held executive positions at Human Genome Sciences, Inc., Bristol-Myers Squibb Co. (NYSE: BMY), a publicly traded biopharmaceutical company, Genentech, Inc. (a member of the Roche Group) and Abbott Laboratories (NYSE: ABT), a publicly traded pharmaceuticals and healthcare products company. In addition, Mr. Karsen served as a general partner at Pequot Ventures. He is a member of the Boards of Directors of publicly traded life sciences companies, Alliqua Biomedical, Inc. (NASDAQ: ALQA) and Agios Pharmaceuticals, Inc. (NASDAQ: AGIO). Mr. Karsen also serves as a member of the boards of directors of the Biotechnology Industry Organization (BIO), and the Life Sciences Foundation. Mr. Karsen received a Masters of Management degree from Northwestern University's Kellogg Graduate School of Management, a Masters of Arts in Teaching of Biology from Duke University and a B.S. in Biological Sciences from the University of Illinois, Urbana-Champaign. We believe Mr. Karsen's executive leadership experience, including his experience as an executive at large and successful multi-national pharmaceutical companies and membership on boards of directors of various trade organizations, qualifies him to serve as a member of our board of directors.

Board Composition

As of July 15, 2015, our board of directors consisted of five members, each of whom are members pursuant to the board composition provisions of our amended and restated certificate of incorporation and our stockholders agreement, which agreement is described in the section titled "Certain Relationships and Related Party Transactions" in this prospectus. These board composition provisions will terminate upon the completion of this offering. Upon the termination of these provisions, there will be no further contractual obligations regarding the election of our directors. Our nominating and corporate governance committee and our board of directors may therefore consider a broad range of factors relating to the qualifications and background of nominees, which may include diversity, which is not only limited to race, gender or national origin. We have no formal policy regarding board diversity. Our nominating and corporate governance committee's and our board of directors' priority in selecting board members is identification of persons who will further the interests of our stockholders through his or her established record of professional accomplishment, the ability to contribute positively to the collaborative culture among board members, knowledge of our business, understanding of the competitive landscape and professional and personal experiences and expertise relevant to our growth strategy. Our directors hold office until their successors have been elected and qualified or until the earlier of their resignation or removal. Our amended and restated certificate of incorporation and amended and restated bylaws that will become effective immediately prior to the completion of this offering also provide that our directors may be removed only for cause by the affirmative vote of the holders of at least 75% of the votes that all our stockholders would be entitled to cast in an annual

election of directors, and that any vacancy on our board of directors, including a vacancy resulting from an enlargement of our board of directors, may be filled only by vote of a majority of our directors then in office. Notwithstanding the foregoing, Dr. Paul will serve without further compensation as a member of the board of directors for as long as he serves as our chief executive officer.

Director Independence

Our board of directors has determined that all members of the board of directors, except Dr. Paul and Mr. Levin, are independent directors, in accordance with listing requirements of The NASDAQ Stock Market and relevant federal securities laws and regulations. Dr. Paul is not an independent director under these rules because he is our Chief Executive Officer and President. Mr. Levin is not an independent director under these rules because he served as our President from June 2013 to September 2014. There are no family relationships among any of our directors or executive officers.

Staggered Board

In accordance with the terms of our amended and restated certificate of incorporation and amended and restated bylaws that will become effective immediately prior to the completion of this offering, our board of directors will be divided into three staggered classes of directors of the same or nearly the same number and each will be assigned to one of the three classes. At each annual meeting of the stockholders, a class of directors will be elected for a three-year term to succeed the directors of the same class whose terms are then expiring. The terms of the directors will expire upon the election and qualification of successor directors at the annual meeting of stockholders to be held during the years 2016 for Class I directors, 2017 for Class II directors and 2018 for Class III directors.

- Our Class I directors will be and ;
- Our Class II directors will be and ; and
- Our Class III directors will be and .

Our amended and restated certificate of incorporation and amended and restated bylaws provide that the number of our directors shall be fixed from time to time by a resolution of the majority of our board of directors. Any additional directorships resulting from an increase in the number of directors will be distributed among the three classes so that, as nearly as possible, each class shall consist of one third of the board of directors.

The division of our board of directors into three classes with staggered three-year terms may delay or prevent stockholder efforts to effect a change of our management or a change in control.

Board Committees

Our board of directors plans on establishing an audit committee, a compensation committee and a nominating and corporate governance committee, each of which will operate pursuant to a charter to be adopted by our board of directors and will be effective upon completion of the offering. Upon the completion of this offering, the composition and functioning of all of our committees will comply with all applicable requirements of the Sarbanes-Oxley Act of 2002, the Dodd-Frank Act, The NASDAQ Stock Market and the SEC rules and regulations.

Audit Committee

Effective upon the completion of this offering, our audit committee will be composed of , and , with serving as chairman of the committee. Our board of directors has determined that each member of the audit committee meets the independence requirements of Rule 10A-3 under the Securities Exchange Act of 1934, as amended, or the Exchange Act, and the

applicable listing standards of The NASDAQ Stock Market. Our board of directors has further determined that is an "audit committee financial expert" within the meaning of the SEC regulations and applicable listing standards of The NASDAQ Stock Market. The audit committee's responsibilities upon completion of this offering will include:

- appointing, approving the compensation of, reviewing the performance of, and assessing the independence of our independent registered public accounting firm;
- pre-approving audit and permissible non-audit services, and the terms of such services, to be provided by our independent registered public accounting firm;
- reviewing the internal audit plan with the independent registered public accounting firm and members of management responsible for preparing our financial statements;
- reviewing and discussing with management and the independent registered public accounting firm our annual and quarterly financial statements and related disclosures as well as critical accounting policies and practices used by us;
- reviewing the adequacy of our internal control over financial reporting;
- establishing policies and procedures for the receipt and retention of accounting-related complaints and concerns;
- recommending, based upon its review and discussions with management and the independent registered public accounting firm, whether our audited financial statements shall be included in our Annual Report on Form 10-K;
- preparing the audit committee report required by the rules of the SEC to be included in our annual proxy statement;
- reviewing all related party transactions for potential conflict of interest situations and approving all such transactions;
- reviewing policies related to risk assessment and risk management; and
- establishing, maintaining and overseeing our Code of Business Conduct and Ethics.

All audit services to be provided to us and all non-audit services, other than de minimis non-audit services, to be provided to us by our independent registered public accounting firm must be approved in advance by our audit committee.

Compensation Committee

Effective upon the completion of this offering, our compensation committee will be composed of , and , with serving as chairman of the committee. Our board of directors has determined each member of the compensation committee is "independent" as defined under the applicable listing standards of The NASDAQ Stock Market, is an "outside director" as defined under Section 162(m) of the Code and a "non-employee director" as defined under Rule 16b-3 of the Exchange Act. The compensation committee's responsibilities upon completion of this offering will include:

- annually reviewing and recommending for approval by the independent directors of the board individual and corporate goals and objectives relevant to the compensation of our executive officers;
- evaluating the performance of our executive officers in light of such individual and corporate goals and objectives and determining the compensation of our executive officers;

- appointing, compensating and overseeing the work of any compensation consultant, legal counsel or other advisor retained by the compensation committee;
- conducting the independence assessment outlined in the rules of The NASDAQ Stock Market with respect to any compensation consultant, legal counsel or other advisor retained by the compensation committee;
- annually reviewing and reassessing the adequacy of the committee charter in its compliance with the listing requirements of The NASDAQ Stock Market;
- overseeing and administering our compensation and similar plans;
- reviewing and approving our policies and procedures for the grant of equity-based awards;
- reviewing and making recommendations to the board of directors with respect to director compensation;
- reviewing and approving stock option grants, and making recommendations to the board of directors with respect to stock option grants made to directors, executive officers, senior vice presidents or anyone reporting directly to our chief executive officer;
- reviewing and discussing with management the compensation discussion and analysis, if any, to be included in our annual proxy statement; and
- reviewing and discussing with the board of directors corporate succession plans for the chief executive officer and other senior management positions.

Nominating and Corporate Governance Committee

Effective upon the completion of this offering, our nominating and corporate governance committee will be composed of , and , with serving as chairman of the committee. Our board of directors has determined that each member of the nominating and corporate governance committee is "independent" as defined under the applicable listing standards of The NASDAQ Stock Market. The nominating and corporate governance committee's responsibilities upon completion of this offering will include:

- developing and recommending to the board of directors criteria for board and committee membership;
- establishing procedures for identifying and evaluating board of director candidates, including nominees recommended by stockholders;
- identifying individuals qualified to become members of the board of directors;
- recommending to the board of directors the persons to be nominated for election as directors and to each of the board's committees; and
- developing and recommending to the board of directors a set of corporate governance principles.

Our board of directors may establish other committees from time to time.

Leadership Structure and Risk Oversight

None of our executive officers serves as a member of the board of directors or compensation committee, or other committee serving an equivalent function, of any other entity that has one or more of its executive officers serving as a member of our board of directors or compensation committee. None of the members of our compensation committee has ever been employed by us. For a description

of transactions between us and members of our compensation committee and affiliates of such members, see the section titled "Certain Relationships and Related Party Transactions."

Compensation Committee Interlocks and Insider Participation

The positions of our chairmen of the board and chief executive officer are separated. Separating these positions allows our chief executive officer to focus on our day-to-day business, while allowing the chairman of the board to lead the board of directors in its fundamental role of providing advice to and independent oversight of management. Our board of directors recognizes the time, effort and energy that the chief executive officer must devote to his position in the current business environment, as well as the commitment required to serve as our chairman, particularly as the board of directors' oversight responsibilities continue to grow. Our board of directors also believes that this structure ensures a greater role for the independent directors in the oversight of our company and active participation of the independent directors in setting agendas and establishing priorities and procedures for the work of our board of directors. This leadership structure also is preferred by a significant number of our stockholders. Our board of directors believes its administration of its risk oversight function has not affected its leadership structure.

Although our bylaws that will be in effect upon the completion of this offering will not require our chairman and chief executive officer positions to be separate, our board of directors believes that having separate positions is the appropriate leadership structure for us at this time and demonstrates our commitment to good corporate governance.

Risk is inherent with every business, and how well a business manages risk can ultimately determine its success. We face a number of risks, including those described under the section titled "Risk Factors." Our board of directors is actively involved in oversight of risks that could affect us. This oversight is conducted primarily by our full board of directors, which has responsibility for general oversight of risks.

Following the completion of this offering, our board of directors will satisfy this responsibility through full reports by each committee chair regarding the committee's considerations and actions, as well as through regular reports directly from officers responsible for oversight of particular risks within our company. Our board of directors believes that full and open communication between management and the board of directors is essential for effective risk management and oversight.

Code of Business Conduct and Ethics

Prior to the completion of this offering, we will adopt a code of business conduct and ethics that applies to all of our employees, officers and directors, including those officers responsible for financial reporting. Upon the completion of this offering, our code of business conduct and ethics will be available on our website, which is located at www.voyagertherapeutics.com. We intend to disclose any amendments to the code, or any waivers of its requirements, on our website, or in a current report on Form 8-K as may be required by law or the listing standards of The NASDAQ Stock Market.

Limitations on Liability and Indemnification Matters

Section 145 of the Delaware General Corporation Law, or the DGCL, authorizes a corporation to indemnify its directors and officers against liabilities arising out of actions, suits and proceedings to which they are made or threatened to be made a party by reason of the fact that they have served or are currently serving as a director or officer to a corporation. The indemnity may cover expenses (including attorneys' fees) judgments, fines and amounts paid in settlement actually and reasonably incurred by the director or officer in connection with any such action, suit or proceeding. Section 145 permits corporations to pay expenses (including attorneys' fees) incurred by directors and officers in advance of the final disposition of such action, suit or proceeding. In addition, Section 145 provides

that a corporation has the power to purchase and maintain insurance on behalf of its directors and officers against any liability asserted against them and incurred by them in their capacity as a director or officer, or arising out of their status as such, whether or not the corporation would have the power to indemnify the director or officer against such liability under Section 145.

We have adopted provisions in our amended and restated certificate of incorporation and amended and restated bylaws to be in effect upon the closing of this offering that limit or eliminate the personal liability of our directors to the fullest extent permitted by the DGCL, as it now exists or may in the future be amended. Consequently, a director will not be personally liable to us or our stockholders for monetary damages or breach of fiduciary duty as a director, except for liability for:

- any breach of the director's duty of loyalty to us or our stockholders;
- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- any unlawful payments related to dividends or unlawful stock purchases, redemptions or other distributions; or
- any transaction from which the director derived an improper personal benefit.

These limitations of liability do not alter director liability under the federal securities laws and do not affect the availability of equitable remedies such as an injunction or rescission.

In addition, our amended and restated bylaws provide that:

- we will indemnify our directors, officers and, in the discretion of our board of directors, certain employees to the fullest extent permitted by the DGCL, as it now exists or may in the future be amended; and
- we will advance reasonable expenses, including attorneys' fees, to our directors and, in the discretion of our board of directors, to our officers and certain employees, in connection with legal proceedings relating to their service for or on behalf of us, subject to limited exceptions.

Additionally, each of our directors may have certain rights to indemnification, advancement of expenses and/or insurance provided by their affiliates, which indemnification relates to and might apply to the same proceedings arising out of such director's services as a director referenced herein. Nonetheless, we have agreed in the indemnification agreements that our obligations to those same directors are primary and any obligation of the affiliates of those directors to advance expenses or to provide indemnification for the expenses or liabilities incurred by those directors are secondary.

We also maintain general liability insurance which covers certain liabilities of our directors and officers arising out of claims based on acts or omissions in their capacities as directors or officers, including liabilities under the Securities Act.

Summary Compensation Table

The following table sets forth information regarding compensation awarded to, earned by or paid to each of our named executive officers during the fiscal years ended December 31, 2014.

Name and Principal Position	Year	Salary ($)	Bonus ($)	Stock Awards ($)[5]	All Other Compensation	Total ($)
Steven M. Paul, M.D.[1] *President and Chief Executive Officer*	2014	$ 150,000	—	$ 876,950	$ 5,870[8]	$ 1,032,820
Mark Levin[2] *Interim President and Chief Executive Officer*	2014	—	—	—	—	—
Bernard Ravina, M.D.[3] *Vice President of Clinical Development*	2014	$ 231,731	$ 101,060[6]	$ 55,000	—	$ 387,791
Robert G. Pietrusko, Pharm.D.[4] *Senior Vice President of Regulatory Affairs*	2014	$ 174,792	$ 1,161[7]	$ 125,000	$ 50,000[9]	$ 350,953

(1) Dr. Paul became our President and Chief Executive Officer in September 2014. From June 2013 to September 2014, Dr. Paul served as our Interim President of Research and Development without any direct cash compensation from us.

(2) Mr. Levin served as our Interim President and Chief Executive Officer until Dr. Paul's appointment in September 2014.

(3) Dr. Ravina became Vice President of Clinical Development in March 2014.

(4) Dr. Pietrusko became Senior Vice President of Regulatory Affairs in June 2014.

(5) This column reflects the full grant date fair value of restricted stock granted during the year as measured pursuant to Financial Accounting Standard Board Accounting Standards Codification Topic 718 (ASC 718).

(6) Amount represents a $100,000 signing bonus and $1,060 in an incentive bonus.

(7) Amount represents $1,161 in an incentive bonus.

(8) Amount represents payment of travel expenses.

(9) Amount represents $50,000 in relocation expenses.

Narrative to Summary Compensation Table

Employment arrangements with our named executive officers

We have entered into an employment agreement or letter agreement with each of our named executive officers in connection with their employment with us. Except as noted below, these employment agreements and offer letters provide for "at will" employment.

Dr. Steven M. Paul. We entered into a letter agreement with Dr. Paul in July 2014 and he assumed the role of President and Chief Executive Officer in September 2014. The agreement entitles Dr. Paul to an initial base salary of $450,000 and eligibility in our bonus pool of up to 40% of his base salary, based upon achievements agreed to between Dr. Paul and the Board. Dr. Paul was also granted 3,165,000 shares of our restricted common stock, which vests on a monthly basis for a period of four years, so long as Dr. Paul continues to be employed by us. If Dr. Paul's employment is terminated by us without cause or by him for good reason within 15 months following the consummation of a sale event, all outstanding stock-based awards with time-based vesting will fully accelerate as of the date of termination.

Dr. Bernard Ravina. We entered into a letter agreement with Dr. Ravina in March 2014 and he assumed the role of Vice President of Clinical Development in March 2014. The agreement entitles Dr. Ravina to an initial base salary of $300,000. Dr. Ravina was also granted 500,000 shares of our restricted common stock, which vests over a period of four years, so long as Dr. Ravina continues to be employed by us. If Dr. Ravina's employment is terminated by us without cause or by him for good reason, he will be entitled to receive continuation of his base salary for three (3) months, plus an amount equal to his target cash bonus as determined by the Company for the year in which the termination of employment occurs, prorated for the portion of the year in which he was employed.

Dr. Robert G. Pietrusko. We entered into a letter agreement with Dr. Pietrusko in May 2014 and he assumed the role of Senior Vice President of Regulatory Affairs in June 2014. The agreement entitles Dr. Pietrusko to an initial base salary of $325,000. Dr. Pietrusko was also granted 500,000 shares of our restricted common stock, which vests over a period of four years, so long as Dr. Pietrusko continues to be employed by us. If Dr. Pietrusko's employment is terminated by us without cause or by him for good reason within 12 months following the consummation of a sale event, all outstanding stock-based awards will fully accelerate as of the date of termination.

Employee confidentiality, non-competition, non-solicitation and assignment agreements

Each of our named executive officers has entered into a standard form agreement with respect to confidential information and assignment of inventions. Among other things, this agreement obligates each named executive officer to refrain from disclosing any of our proprietary information received during the course of employment and to assign to us any inventions conceived or developed during the course of employment. Such agreement also provides that during the period of the named executive officer's employment and for 12 months thereafter, the named executive officer will not compete with us and will not solicit our employees, consultants, customers or suppliers.

2014 Outstanding Equity Awards at Fiscal Year-End

The following table sets forth information concerning outstanding equity awards for each of our named executive officers at December 31, 2014:

	Stock Awards	
Name	**Number of Shares or Units of Stock That Have Not Vested (#)**	**Market Value of Shares of Stock That Have Not Vested ($)[5]**
Steven M. Paul, M.D.	2,967,187(1)	
	243,750(2)	
Mark Levin	—	
Bernard Ravina, M.D.	500,000(3)	
Robert G. Pietrusko, Pharm.D.	500,000(4)	

(1) Dr. Paul was granted restricted stock on August 19, 2014. The shares underlying this grant vest in equal monthly installments over the following 48 months.

(2) Dr. Paul was granted restricted stock on January 8, 2014. The shares underlying this grant vest in equal quarterly installments over the following 16 quarters.

(3) Dr. Ravina was granted restricted stock on April 16, 2014. The shares underlying this grant vest as follows: 25% vest on March 24, 2015, with the remainder of the shares vesting in equal monthly installments over the following 36 months.

(4) Dr. Pietrusko was granted restricted stock on August 19, 2014. The shares underlying this grant vest as follows: 25% vest on June 17, 2015, with the remainder of the shares vesting in equal monthly installments over the following 36 months.

(5) The market price of our common stock is based on an assumed initial public offering price of $ per share, the midpoint of the estimated price range set forth on the cover of this prospectus.

Director Compensation

The following table sets forth a summary of the compensation we paid to our nonemployee directors during 2014. Other than as set forth in the table and described more fully below, we did not pay any compensation, reimburse any expense of, make any equity awards or non-equity awards to, or pay any other compensation to any of the other nonemployee members of our board of directors in 2014. We reimburse nonemployee directors for reasonable travel expenses. Dr. Paul, our Chief Executive Officer and President, receives no compensation for his service as a director, and, consequently, is not included in this table. The compensation received by Dr. Paul as an employee during 2014 is presented in the "Summary Compensation Table" above.

Name	Fees Earned or Paid In Cash ($)	Option Awards ($)	Stock Awards ($)	All Other Compensation ($)	Total ($)
Mark Levin	—	—	—	—	—
James A. Geraghty	—	—	$ 35,700	—	$ 35,700

Nonemployee Director Compensation Policy

In May 2015, our board of directors adopted a non-employee director compensation policy, that will remain in effect until the completion of this offering. Under the nonemployee director compensation policy, each nonemployee director will receive an annual retainer of $35,000. Each person who is initially appointed or elected to the board of directors will be eligible for an option grant to purchase up to 135,000 shares of our common stock under our stock option plan on the date he or she first becomes a nonemployee director, which will vest annually over a four-year period. In addition, each nonemployee director will receive an annual option grant to purchase up to 25,000 shares of our common stock, which will vest in quarterly installments over a period of one year. All of the foregoing options will be granted at fair market value on the date of grant. Prior to May 2015, there was no formal policy for nonemployee director compensation.

In , our board of directors adopted a nonemployee director compensation policy, that will be effective as of the completion of this offering, that is designed to provide a total compensation package that enables us to attract and retain, on a long-term basis, high caliber nonemployee directors. Under the policy, all nonemployee directors will be paid cash compensation from and after the completion of this offering, as set forth below:

	Annual Retainer
Board of Directors:	
All nonemployee members	$
Additional retainer for Non-Executive Chairman of the Board	$
Audit Committee:	
Chairman	$
Non-Chairman members	$
Compensation Committee:	
Chairman	$
Non-Chairman members	$
Nominating and Corporate Governance Committee:	
Chairman	$
Non-Chairman members	$

Under the nonemployee director compensation policy, each person who is initially appointed or elected to the board of directors will be eligible for an option grant to purchase up to shares of our common stock under our stock option plan on the date he or she first becomes a nonemployee director, which will vest . In addition, on the date of the annual meeting of stockholders, each continuing nonemployee director who has served on the board of directors for a minimum of six months will be eligible to receive an annual option grant to purchase up to shares of our common stock, which will vest . All of the foregoing options will be granted at fair market value on the date of grant.

Compensation Risk Assessment

We believe that although a portion of the compensation provided to our executive officers and other employees is performance-based, our executive compensation program does not encourage excessive or unnecessary risk-taking. This is primarily due to the fact that our compensation programs are designed to encourage our executive officers and other employees to remain focused on both short-term and long-term strategic goals, in particular in connection with our pay-for-performance compensation philosophy. As a result, we do not believe that our compensation programs are reasonably likely to have a material adverse effect on the company.

Stock Option Plans

2014 Stock Option Plan

The 2014 Stock Option and Grant Plan, or 2014 Stock Option Plan, was approved by our board of directors and our stockholders on January 8, 2014, and was most recently amended on April 16, 2014, August 19, 2014 and April 27, 2015. As of April 27, 2015, 8,700,000 shares of common stock have been reserved for issuance under the 2014 Stock Option Plan in the form of incentive stock options, non-qualified stock options, restricted stock, unrestricted stock, restricted stock units or any combination of the foregoing. The shares issuable pursuant to awards granted under the 2014 Stock Option Plan are authorized but unissued shares.

The 2014 Stock Option Plan is administered by our board or at the discretion of the board, a committee of the board comprised of not less than two (2) directors, which has full power to select the employees, directors and service providers to whom awards will be granted and to determine the specific terms and conditions of each award, subject to the provisions of the 2014 Stock Option Plan.

The option exercise price or the restricted stock purchase price of each award granted under the 2014 Stock Option Plan is determined by our board and may not be less than the fair market value of a share of common stock on the date of grant. The term of each option is fixed by the board and may not exceed 10 years from the date of grant. The board determines at what time or times each option may be exercised when granting the option.

The 2014 Stock Option Plan provides that, upon a sale transaction of the company, unless provision is made in connection with the sale transaction in the sole discretion of the parties thereto for the assumption or continuation of the awards by the successor entity or substitution of the awards with new awards of the successor entity, with appropriate adjustment, all options not exercised will terminate upon the closing of the sale transaction.

Our board may amend the 2014 Stock Option Plan but no such action may adversely affect the rights of an award holder without such holder's consent. Approval by our stockholders of amendments to the 2014 Stock Option Plan must be obtained if required by law.

As of March 31, 2015, restricted stock awards for 7,263,112 shares of common stock were outstanding under the 2014 Stock Option Plan. As of March 31, 2015, no options were granted under

the 2014 Stock Option Plan. Our board has determined not to make any further awards under the 2014 Stock Option Plan following the completion of this offering.

2015 Stock Option Plan

On , our board of directors adopted and our stockholders approved our 2015 Stock Option and Incentive Plan, or 2015 Stock Option Plan, which will become effective upon completing of this offering and will replace the 2014 Stock Option Plan. Our 2015 Stock Option Plan provides us flexibility to use various equity-based incentive and other awards as compensation tools to motivate our workforce. These tools include stock options, stock appreciation rights, restricted stock, restricted stock units, unrestricted stock, performance share awards and cash-based awards. The 2015 Stock Option Plan will become effective immediately prior to the completion of this offering.

We have initially reserved shares of common stock for the issuance of awards under the 2015 Stock Option Plan (not including shares of common stock reserved for issuance under our 2014 Stock Option Plan, which will be added to the shares reserved under the 2015 Stock Option Plan), which may be increased on the first day of each fiscal year by up to % of the number of shares of common stock issued and outstanding on the immediately preceding December 31. This number is subject to adjustment in the event of a stock split, stock dividend or other change in our capitalization.

The shares issuable pursuant to awards granted under the 2015 Stock Option Plan will be authorized but unissued shares or shares that we reacquire. The shares of common stock underlying any awards from the 2015 Stock Option Plan and the 2014 Stock Option Plan that are forfeited, cancelled, held back upon exercise or settlement of an award to satisfy the exercise price or tax withholding, reacquired by us prior to vesting, satisfied without any issuance of common stock, expire or are otherwise terminated (other than by exercise) under the 2015 Stock Option Plan will be added back to the shares available for issuance under the 2015 Stock Option Plan.

Under the 2015 Stock Option Plan, stock options or stock appreciation rights with respect to no more than shares may be granted to any one individual in any one calendar year and the maximum aggregate number of shares that may be issued in the form of incentive stock options shall not exceed the initial number of shares reserved and available for issuance under the 2015 Stock Option Plan.

The 2015 Stock Option Plan will be administered by the compensation committee of the board of directors. The compensation committee has full power to select, from among the individuals eligible for awards, the individuals to whom awards will be granted, to make any combination of awards to participants, and to determine the specific terms and conditions of each award, subject to the provisions of the 2015 Stock Option Plan. Employees, nonemployee directors and other key persons (including consultants) are eligible to receive awards under the 2015 Stock Option Plan.

The 2015 Stock Option Plan permits the granting of both options to purchase common stock intended to qualify as incentive stock options under Section 422 of the Code and options that do not so qualify. The exercise price of each stock option will be determined by our compensation committee but may not be less than 100% of the fair market value of our common stock on the date of grant or, in the case of an incentive stock option granted to a 10% owner, less than 110% of the fair market value of our common stock on the date of grant. The term of each stock option will be fixed by the compensation committee and may not exceed 10 years from the date of grant (or five years in the case of an incentive stock option granted to a 10% owner). The compensation committee will also determine the vesting schedule for granted stock options.

The compensation committee may award stock appreciation rights subject to such conditions and restrictions as it may determine. Stock appreciation rights entitle the recipient to shares of common

stock, or cash, equal to the value of the appreciation in our stock price over the exercise price. The exercise price of each stock appreciation right may not be less than 100% of the fair market value of the common stock on the date of grant.

The compensation committee may award restricted stock or restricted stock units to participants subject to such conditions and restrictions as it may determine. These conditions and restrictions may include the achievement of certain performance goals and/or continued employment or service with us through a specified vesting period. The compensation committee may also grant cash-based awards to participants subject to such conditions and restrictions as it may determine. Our compensation committee may also grant shares of common stock that are free from any restrictions under the 2014 Stock Option Plan. Unrestricted stock may be granted to participants in recognition of past services or for other valid consideration and may be issued in lieu of cash compensation due to such participant.

The compensation committee may grant performance share awards to participants that entitle the recipient to receive share awards of common stock upon the achievement of certain performance goals and such other conditions as our compensation committee shall determine.

The compensation committee may grant cash bonuses under the 2015 Stock Option Plan to participants, subject to the achievement of certain performance goals.

The compensation committee may grant performance-based awards to participants in the form of restricted stock, restricted stock units, performance shares or cash-based awards upon the achievement of certain performance goals and such other conditions as the compensation committee shall determine. The compensation committee may grant such performance-based awards under the 2015 Stock Option Plan that are intended to qualify as "performance-based compensation" under Section 162(m) of the Code. Those awards would only vest or become payable upon the attainment of performance goals that are established by our compensation committee and related to one or more performance criteria. The performance criteria that could be used with respect to any such awards include: total stockholder return, earnings before interest, taxes, depreciation and amortization, net income (loss) (either before or after interest, taxes, depreciation and/or amortization), changes in the market price of our common stock, economic value-added, sales or revenue, development, clinical or regulatory milestones, acquisitions or strategic transactions, operating income (loss), cash flow (including, but not limited to, operating cash flow and free cash flow), return on capital, assets, equity, or investment, return on sales, gross or net profit levels, productivity, expense, margins, operating efficiency, customer satisfaction, working capital, earnings (loss) per share of stock, sales or market shares and number of customers, any of which may be measured either in absolute terms or as compared to any incremental increase or as compared to results of a peer group. From and after the time that we become subject to Section 162(m) of the Code, the maximum award that is intended to qualify as "performance-based compensation" under Section 162(m) of the Code that may be made to any one employee during any one calendar year period is shares with respect to a stock-based award and $1,000,000 with respect to a cash-based award.

The 2015 Stock Option Plan provides that upon the effectiveness of a "sale event," as defined in the 2015 Stock Option Plan, all options and stock appreciation rights that are not exercisable immediately prior to the effective time of the sale event shall become fully exercisable as of the effective time of the sale event, all other awards with time-based vesting, conditions or restrictions, shall become fully vested and nonforfeitable as of the effective time of the sale event and all awards with conditions and restrictions relating to the attainment of performance goals may become vested and nonforfeitable in the discretion of the compensation committee and all awards granted under the 2015 Stock Option Plan shall terminate. In addition, in connection with the termination of the 2015 Stock Option Plan upon a sale event, we may make or provide for a cash payment to participants holding options and stock appreciation rights equal to the difference between the per share cash consideration

payable to stockholders in the sale event and the exercise price of the options or stock appreciation rights.

Our board of directors may amend or discontinue the 2015 Stock Option Plan and our compensation committee may amend or cancel outstanding awards for purposes of satisfying changes in law or any other lawful purpose, including option repricing, but no such action may adversely affect rights under an award without the holder's consent. Certain amendments to the 2015 Stock Option Plan may require the approval of our stockholders.

No awards may be granted under the 2015 Stock Option Plan after the date that is 10 years from the date of stockholder approval of the 2015 Stock Option Plan.

Other Compensation

We currently maintain broad-based benefits that are provided to all employees, including health insurance, life and disability insurance and dental insurance.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

In addition to the compensation arrangements, including employment arrangements and indemnification arrangements, discussed, when required, in the sections titled "Management" and "Executive Compensation" and the registration rights described in the section titled "Description of Capital Stock—Registration Rights," the following is a description of each transaction since our inception on June 19, 2013 and each currently proposed transaction in which:

- we have been or are to be a participant;
- the amount involved exceeded or exceeds $120,000; and
- any of our directors, executive officers, holders of more than 5% of our capital stock or any immediate family member of, or person sharing the household with, any of these individuals, had or will have a direct or indirect material interest.

In connection with this offering, we plan to adopt a written policy, effective upon completion of this offering, that requires all future transactions between us and any director, executive officer, holder of 5% or more of any class of our capital stock or any member of the immediate family of, or entities affiliated with, any of them, or any other related persons (as defined in Item 404 of Regulation S-K) or their affiliates, in which the amount involved is equal to or greater than $120,000, be approved in advance by our audit committee. Any request for such a transaction must first be presented to our audit committee for review, consideration and approval. In approving or rejecting any such proposal, our audit committee is to consider the relevant facts and circumstances available and deemed relevant to the audit committee, including, but not limited to, the extent of the related party's interest in the transaction, and whether the transaction is on terms no less favorable to us than terms we could have generally obtained from an unaffiliated third party under the same or similar circumstances.

All of the transactions described below were entered into prior to the adoption of this written policy but each was approved by our board of directors. Prior to our board of directors' consideration of a transaction with a related person, the material facts as to the related person's relationship or interest in the transaction were disclosed to our board of directors, and the transaction was not approved by our board of directors unless a majority of the directors approved the transaction. Our current policy with respect to approval of related person transactions is not set forth in writing.

Private Placement of Securities

Common Stock

On June 26, 2013, we entered into a subscription agreement with a fund affiliated with Third Rock Ventures, LLC, or TRV, pursuant to which we issued 10,000 shares of our common stock at a price of $0.001 per share. On January 9, 2014, we entered into a subscription agreement with TRV, pursuant to which we issued 2,000,000 shares of our common stock at a price of $0.001 per share.

Series A Financing

On January 9, 2014, we entered into a securities purchase agreement with TRV, pursuant to which we issued, in a series of closings, an aggregate of 45,000,000 shares of our Series A Preferred Stock at a price of $1.00 per share.

The following table summarizes the participation in the Series A convertible preferred stock financing by any of our directors, executive officers, holders of more than 5% of our voting securities, or any member of the immediate family of the foregoing persons.

Name	Shares of Series A Preferred	Aggregate Purchase Price Paid	Date Purchased
Third Rock Ventures III, L.P.	6,500,000	$ 6,500,000*	January 9, 2014
Third Rock Ventures III, L.P.	6,000,000	$ 6,000,000	April 16, 2014
Third Rock Ventures III, L.P.	6,000,000	$ 6,000,000	August 5, 2014
Third Rock Ventures III, L.P.	6,500,000	$ 6,500,000	December 4, 2014
Third Rock Ventures III, L.P.	20,000,000	$ 20,000,000	February 6, 2015

* Inclusive of the exchange of Convertible Promissory Notes Payable of $2.9 million.

Series B Financings and Strategic Collaboration

On February 11, 2015, we entered into a securities purchase agreement with Aventis, Inc., or Aventis, an affiliate of Genzyme, pursuant to which we issued 10,000,000 shares of Series B convertible preferred stock at a purchase price of $3.00 per share. Concurrently, we entered into a strategic collaboration with Genzyme, to leverage our combined expertise and assets to develop AAV gene therapies for CNS diseases. Under the agreement, we received an upfront commitment of approximately $100 million and are eligible for up to $745 million in option and milestone payments. For more information about our collaboration with Genzyme, see the section titled "Business—Collaboration and License Agreements—Genzyme Corporation."

On April 9, 2015, we entered into a stock purchase agreement with funds associated with certain other investors pursuant to which we issued in one closing an aggregate of 20,000,001 shares of our Series B convertible preferred stock at a price of $3.00 per share.

The following table summarizes the participation in the Series B convertible preferred stock financing by any of our directors, executive officers, holders of more than 5% of our voting securities, or any member of the immediate family of the foregoing persons:

Name	Shares of Series B Preferred	Aggregate Purchase Price Paid	Date Purchased
Aventis, Inc.(1)	10,000,000	$ 30,000,000	February 11, 2015
Funds affiliated with Fidelity Management Research Company	6,666,667	$ 20,000,001	April 9, 2015
Brookside Capital Partners Fund, LP	5,000,000	$ 15,000,000	April 9, 2015
Funds affiliated with Partners Investments	4,666,667	$ 14,000,001	April 9, 2015

(1) Aventis, Inc. is an affiliate of Genzyme.

Agreements with Stockholders

In connection with the Series B redeemable convertible preferred stock financing, we entered into the Second Amended and Restated Investors' Rights Agreement, or investor rights agreement, dated as of April 9, 2015, with certain of our stockholders, including our principal stockholders and their affiliates and the Second Amended and Restated Stockholders Agreement, or Stockholders Agreement, dated as of April 9, 2015, with certain of our stockholders, including our principal stockholders and their affiliates. All of the provisions of these agreements will terminate immediately upon completion of the offering, other than the lock-up provisions contained therein and the provisions relating to registration rights, which will continue in effect following completion of the offering and entitle the

holders of such rights to have us register their shares of our common stock for sale in the United States. See the section titled "Description of Capital Stock—Registration Rights."

During the period and fiscal year ended December 31, 2013 and 2014, respectively, we incurred consulting fees to TRV in the amount of $2.4 million and $1.3 million, respectively. TRV is a management company that is party to a services agreement with Third Rock Ventures, L.P., the beneficial owner of more than 5% of our voting securities. Mr. Levin and Mr. Geraghty are members of our board of directors and Dr. Paul is our President, CEO and a member of our board of directors, and Mr. Levin is a managing member of TRV GP, LLC, which is the general partner of Third Rock Ventures GP, L.P., the general partner of Third Rock Ventures, L.P. and a managing member of TRV, Mr. Geraghty is an entrepreneur-in-residence at TRV and Dr. Paul is a venture partner at TRV. These consulting fees were paid to TRV in amounts mutually agreed upon in advance by us and TRV in consideration of certain strategic and ordinary course business operations consulting services provided to us on an as-needed basis, from time to time and at our request, by individuals related to TRV, including Dr. Paul and Mr. Geraghty but not including Mr. Levin. Such fees were payable pursuant to invoices submitted to us by TRV from time to time. None of these consulting fees were paid directly or indirectly to Mr. Levin, Mr. Geraghty or Dr. Paul. The consulting fees paid to TRV did not exceed 5% of the consolidated gross revenue of TRV during any of these fiscal years.

Executive Officer and Director Compensation

See the section titled "Executive Compensation" for information regarding compensation of our executive officers and directors.

Employment Agreements

We have entered into offer letters or employment agreements with our executive officers. For more information regarding our agreements with our named executive officers for the fiscal year ended December 31, 2014, see the section titled "Executive Compensation—Narrative to Summary Compensation Table—Employment Arrangements with our Named Executive Officers."

Indemnification Agreements

We have entered into or plan to enter into indemnification agreements with each of our directors and officers, the form of which is attached as an exhibit to the registration statement of which this prospectus is a part. The indemnification agreements and our amended and restated certificate of incorporation and amended and restated by laws require us to indemnify our directors and officers to the fullest extent permitted by Delaware law.

PRINCIPAL STOCKHOLDERS

The following table sets forth certain information with respect to the beneficial ownership of our common stock as of March 31, 2015, and as adjusted to reflect the sale of common stock offered by us in this offering assuming no exercise of the underwriters' option to purchase additional shares, for:

- each of our named executive officers;
- each of our directors;
- all of our directors and executive officers as a group; and
- each person known by us to be the beneficial owner of more than five percent of any class of our voting securities.

We have determined beneficial ownership in accordance with the rules of the SEC, and thus it represents sole or shared voting or investment power with respect to our securities. Unless otherwise indicated below, to our knowledge, the persons and entities named in the table have sole voting and sole investment power with respect to all shares that they beneficially owned, subject to community property laws where applicable.

We have based percentage ownership of our common stock before this offering on shares of our common stock outstanding as of March 31, 2015, which includes shares of common stock resulting from the automatic conversion of all outstanding shares of our convertible preferred stock immediately prior to the completion of this offering, as if this conversion had occurred as of March 31, 2015. Percentage ownership of our common stock after this offering assumes our sale of shares of common stock in this offering.

	Shares Beneficially Owned Prior to the Offering		Shares Beneficially Owned After to the Offering
Name and Address of Beneficial Owner[1]	Number	Percent	
5% or Greater Stockholders:			
Third Rock Ventures, L.P.[2]	47,010,000	67.7%	
Aventis, Inc.[3]	10,000,000	14.4	
Directors and Named Executive Officers:			
Steven M. Paul, M.D.[4]	3,665,000	5.3	
Named Executive Officers			
Robert G. Pietrusko, Pharm.D.[5]	500,000	*	
Bernard Ravina, M.D.[6]	500,000	*	
Other Directors			
Mark Levin	—	—	
James A. Geraghty[7]	300,000	*	
All executive officers and directors as a group (5 persons)	4,965,000	7.2	

* Represents beneficial ownership of less than 1% of our outstanding common stock.

(1) Unless otherwise indicated, the address for each beneficial owner is c/o Voyager Therapeutics, Inc., 75 Sidney Street, Cambridge, Massachusetts 02139.

(2) The address for Third Rock Ventures III, L.P., or TRV LP is 29 Newbury Street, 3rd Floor, Boston, MA 02116. Consists of (i) 45,000,000 shares of common stock issuable upon conversion of shares of Series A convertible preferred stock and (ii) 2,010,000 shares of common stock. All shares are held directly by TRV LP. Each of Third Rock Ventures II GP, L.P., or TRV GP, the general partner of TRV LP, Third Rock Ventures II GP, LLC, or TRV LLC, the general partner of TRV GP, and Mark Levin, Kevin Starr and Robert Tepper, the managers of TRV LLC, may be deemed to share voting and investment power over the shares held of record by TRV LP. Each of TRV GP, TRV LLC, Mark Levin, Kevin Starr and Robert Tepper disclaims beneficial ownership of all shares held by TRV LP except to the extent of their pecuniary interest therein. Mr. Starr is a member of our board of directors.

(3) The address for Aventis Inc. is 55 Corporate Drive, Bridgewater, New Jersey, 08807. Consists of 10,000,000 shares of common stock issuable upon conversion of shares of Series B convertible preferred stock. Aventis, Inc. is an affiliate of Genzyme.

(4) Consists of 3,665,000 shares of restricted stock.

(5) Consists of 500,000 shares of restricted stock.

(6) Consists of 500,000 shares of restricted stock.

(7) Consists of 300,000 shares of restricted stock.

DESCRIPTION OF CAPITAL STOCK

General

The following description summarizes the most important terms of our capital stock, as they are expected to be in effect upon the completion of this offering. We expect to adopt an amended and restated certificate of incorporation and amended and restated bylaws in connection with this offering, and this description summarizes the provisions that are expected to be included in such documents. Because it is only a summary, it does not contain all the information that may be important to you. For a complete description of the matters set forth in the section titled "Description of Capital Stock," you should refer to our amended and restated certificate of incorporation and amended and restated bylaws, which are or will be included as exhibits to the registration statement of which this prospectus forms a part, and to the applicable provisions of Delaware law. Immediately following the completion of this offering, our authorized capital stock will consist of shares of common stock, $0.001 par value per share, and shares of undesignated preferred stock, $0.001 par value per share.

Assuming the conversion of all outstanding shares of our convertible preferred stock into shares of our common stock, which will occur immediately prior to the completion of this offering, as of March 31, 2015, there were shares of our common stock outstanding, held by stockholders of record, and no shares of our convertible preferred stock outstanding. Our board of directors is authorized, without stockholder approval, except as required by the listing standards of The NASDAQ Stock Market, to issue additional shares of our capital stock.

Common Stock

Upon the completion of this offering, we will be authorized to issue one class of common stock. Holders of our common stock are entitled to one vote for each share of common stock held of record for the election of directors and on all matters submitted to a vote of stockholders. Holders of our common stock are entitled to receive dividends ratably, if any, as may be declared by our board of directors out of legally available funds, subject to any preferential dividend rights of any preferred stock then outstanding. Upon our dissolution, liquidation or winding up, holders of our common stock are entitled to share ratably in our net assets legally available after the payment of all our debts and other liabilities, subject to the preferential rights of any preferred stock then outstanding. Holders of our common stock have no preemptive, subscription, redemption or conversion rights. The rights, preferences and privileges of holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future. Except as described in the section titled "Anti-takeover Provisions" below, a majority vote of the holders of common stock is generally required to take action under our amended and restated certificate of incorporation and amended and restated by-laws. All of our outstanding shares of common stock are, and the shares of common stock to be issued in this offering will be, fully paid and nonassessable.

Preferred Stock

Upon the completion of this offering, our board of directors will be authorized, without action by the stockholders, to designate and issue up to an aggregate of shares of preferred stock in one or more series. Our board of directors can designate the rights, preferences and privileges of the shares of each series and any of its qualifications, limitations or restrictions. Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of common stock. The issuance of preferred stock, while providing flexibility in connection with possible future financings and acquisitions and other corporate purposes could, under certain circumstances, have the effect of restricting dividends on our common stock, diluting the voting power of our common stock, impairing the liquidation rights of our common

stock, or delaying, deferring or preventing a change in control of our company, which might harm the market price of our common stock. See the section titled "Anti-takeover Provisions" below.

Our board of directors will make any determination to issue such shares based on its judgment as to our company's best interests and the best interests of our stockholders. Upon the completion of this offering, we will have no shares of preferred stock outstanding and we have no current plans to issue any shares of preferred stock following completion of this offering.

Registration Rights

Upon the completion of this offering, the holders of 75,000,001 shares of our common stock, including shares issuable upon the conversion of our convertible preferred stock or their permitted transferees, are entitled to rights with respect to the registration of these securities under the Securities Act. These rights are provided under the terms of the investor rights agreement. The investor rights agreement includes demand registration rights, short-form registration rights and piggyback registration rights. All fees, costs and expenses of underwritten registrations under the investor rights agreement will be borne by us and all selling expenses, including underwriting discounts and selling commissions, will be borne by the holders of the shares being registered.

Demand Registration Rights

Upon the completion of this offering, the holders of 75,000,001 shares of our common stock, including shares issuable upon the conversion of our convertible preferred stock or their permitted transferees, are entitled to demand registration rights. Under the terms of the investor rights agreement, we will be required, upon the written request of either holders of 25% of these securities, or Aventis, in each case for at least $3.0 million, to file a registration statement and use commercially reasonable efforts to effect the registration of all or a portion of these shares for public resale. We are required to effect only two registrations pursuant to this provision of the investor rights agreement. A demand for registration may not be made until 180 days after the completion of this offering.

Short-Form Registration Rights

Upon the completion of this offering, the holders of 75,000,001 shares of our common stock, including shares issuable upon the conversion of our convertible preferred stock or their permitted transferees, are also entitled to short-form registration rights. Pursuant to the investor rights agreement, if we are eligible to file a registration statement on Form S-3, upon the request of either 25% of these holders to sell registrable securities, or Aventis, in each case for an aggregate price of at least $1.0 million, we will be required to use our commercially reasonable efforts to effect a registration of such shares. We are required to effect only one registration in any 12-month period pursuant to this provision of the investor rights agreement.

Piggyback Registration Rights

Upon the completion of this offering, the holders of 75,000,001 shares of our common stock, including shares issuable upon the conversion of our convertible preferred stock or their permitted transferees, are entitled to piggyback registration rights. If we register any of our securities either for our own account or for the account of other security holders, the holders of these shares are entitled to include their shares in the registration. Subject to certain exceptions contained in the investor rights agreement, we and the underwriters may limit the number of shares included in the underwritten offering if the underwriters determine in good faith that marketing factors require a limitation of the number of shares to be underwritten.

Expiration of Registration Rights

The registration rights granted under the investor rights agreement will terminate upon the earlier of (i) a deemed liquidation event, as defined in our amended and restated certificate of incorporation, (ii) at such time when all registrable securities could be sold without restriction under Rule 144 of the Securities Act or (iii) the fifth anniversary of our initial public offering.

Anti-takeover Provisions

Our amended and restated certificate of incorporation and amended and restated bylaws will contain certain provisions that are intended to enhance the likelihood of continuity and stability in the composition of the board of directors and which may have the effect of delaying, deferring or preventing a future takeover or change in control of the company unless such takeover or change in control is approved by the board of directors.

These provisions include:

Classified Board. Our amended and restated certificate of incorporation will provide that our board of directors will be divided into three classes of directors, with the classes as nearly equal in number as possible. As a result, approximately one-third of our board of directors will be elected each year. The classification of directors will have the effect of making it more difficult for stockholders to change the composition of our board. Our amended and restated certificate of incorporation will also provide that, subject to any rights of holders of preferred stock to elect additional directors under specified circumstances, the number of directors will be fixed exclusively pursuant to a resolution adopted by our board of directors. Upon completion of this offering, we expect that our board of directors will have members.

Action by Written Consent; Special Meetings of Stockholders. Our amended and restated certificate of incorporation will provide that stockholder action can be taken only at an annual or special meeting of stockholders and cannot be taken by written consent in lieu of a meeting. Our amended and restated certificate of incorporation and the bylaws will also provide that, except as otherwise required by law, special meetings of the stockholders can be called only by or at the direction of the board of directors pursuant to a resolution adopted by a majority of the total number of directors. Stockholders will not be permitted to call a special meeting or to require the board of directors to call a special meeting.

Removal of Directors. Our amended and restated certificate of incorporation will provide that our directors may be removed only for cause by the affirmative vote of at least 75% of the votes that all our stockholders would be entitled to cast in an annual election of directors, voting together as a single class, at a meeting of the stockholders called for that purpose. This requirement of a supermajority vote to remove directors could enable a minority of our stockholders to prevent a change in the composition of our board.

Advance Notice Procedures. Our amended and restated bylaws will establish an advance notice procedure for stockholder proposals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to the board of directors. Stockholders at an annual meeting will only be able to consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of the board of directors or by a stockholder who was a stockholder of record on the record date for the meeting, who is entitled to vote at the meeting and who has given our Secretary timely written notice, in proper form, of the stockholder's intention to bring that business before the meeting. Although the amended and restated bylaws will not give the board of directors the power to approve or disapprove stockholder nominations of candidates or proposals regarding other business to be conducted at a special or annual meeting, the bylaws may have the effect of precluding the conduct of certain business at a meeting if the proper procedures are not followed or may discourage or deter a potential acquirer from conducting a

solicitation of proxies to elect its own slate of directors or otherwise attempting to obtain control of the company.

Super Majority Approval Requirements. The Delaware General Corporation Law generally provides that the affirmative vote of a majority of the shares entitled to vote on any matter is required to amend a corporation's certificate of incorporation or bylaws, unless either a corporation's certificate of incorporation or bylaws requires a greater percentage. A majority vote of our board of directors or the affirmative vote of holders of at least 75% of the total votes of the outstanding shares of capital stock of the Company entitled to vote with respect thereto, voting together as a single class, will be required to amend, alter, change or repeal our amended and restated certificate of incorporation. In addition, the affirmative vote of the holders of at least 75% of the total votes of the outstanding shares of capital stock of the Company entitled to vote with respect thereto, voting together as a single class, will be required to amend, alter, change or repeal, or to adopt any provisions inconsistent with, any of the provisions in our certificate of incorporation relating to amendments to our amended and restated certificate of incorporation and amended and restated bylaws and as described in the sections titled "Action by Written Consent; Special Meetings of Stockholders," "Classified Board" and "Removal of Directors" above. This requirement of a supermajority vote to approve amendments to our amended and restated bylaws and amended and restated certificate of incorporation could enable a minority of our stockholders to exercise veto power over any such amendments.

Authorized but Unissued Shares. Our authorized but unissued shares of common stock and preferred stock will be available for future issuance without stockholder approval. These additional shares may be utilized for a variety of corporate purposes, including future public offerings to raise additional capital and corporate acquisitions. The existence of authorized but unissued shares of common stock and preferred stock could render more difficult or discourage an attempt to obtain control of a majority of our common stock by means of a proxy contest, tender offer, merger or otherwise.

Exclusive Forum. Our amended and restated certificate of incorporation will provide that, subject to limited exceptions, the state or federal courts located in the State of Delaware will be the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (iii) any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws or (iv) any other action asserting a claim against us that is governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our certificate of incorporation described above. Although we believe these provisions benefit us by providing increased consistency in the application of Delaware law for the specified types of actions and proceedings, the provisions may have the effect of discouraging lawsuits against our directors and officers. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with one or more actions or proceedings described above, a court could find the choice of forum provisions contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable.

Section 203 of the Delaware General Corporation Law

Upon completion of this offering, we will be subject to the provisions of Section 203 of the Delaware General Corporation Law. In general, Section 203 prohibits a publicly-held Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a three-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. A "business combination" includes, among

other things, a merger, asset or stock sale or other transaction resulting in a financial benefit to the interested stockholder. An "interested stockholder" is a person who, together with affiliates and associates, owns, or did own within three years prior to the determination of interested stockholder status, 15% or more of the corporation's voting stock.

Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions: before the stockholder became interested, the board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder; upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 75% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances; or at or after the time the stockholder became interested, the business combination was approved by the board of directors of the corporation and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

A Delaware corporation may "opt out" of these provisions with an express provision in its original certificate of incorporation or an express provision in its certificate of incorporation or bylaws resulting from a stockholders' amendment approved by at least a majority of the outstanding voting shares. We have not opted out of these provisions. As a result, mergers or other takeover or change in control attempts of us may be discouraged or prevented.

Transfer Agent and Registrar

Upon the completion of this offering, the transfer agent and registrar for our common stock will be Computershare Trust N.A.

The NASDAQ Global Market Listing

We intend to apply for the listing of our common stock on The NASDAQ Global Market under the symbol "VYGR".

SHARES ELIGIBLE FOR FUTURE SALE

Prior to this offering, there has been no public market for our common stock, and we cannot predict the effect, if any, that market sales of shares of our common stock or the availability of shares of our common stock for sale will have on the market price of our common stock prevailing from time to time. Future sales of our common stock in the public market, or the availability of such shares for sale in the public market, could adversely affect market prices prevailing from time to time. As described below, only a limited number of shares will be available for sale shortly after this offering due to contractual and legal restrictions on resale. Nevertheless, sales of our common stock in the public market after such restrictions lapse, or the perception that those sales may occur, could adversely affect the prevailing market price at such time and our ability to raise equity capital in the future.

Sale of Restricted Shares

Following the completion of this offering, based on the number of shares of our capital stock outstanding as of March 31, 2015, we will have a total of shares of our common stock outstanding. Of these outstanding shares, all of the shares of common stock sold in this offering will be freely tradable, except that any shares purchased in this offering by our affiliates, as that term is defined in Rule 144 under the Securities Act, would only be able to be sold in compliance with the Rule 144 limitations described below.

The remaining outstanding shares of our common stock will be deemed "restricted securities" as defined in Rule 144. Restricted securities may be sold in the public market only if they are registered or if they qualify for an exemption from registration under Rule 144 or Rule 701 under the Securities Act, which rules are summarized below. In addition, all of our executive officers, directors and holders of substantially all of our common stock and securities convertible into or exchangeable for our common stock have entered into market standoff agreements with us or lock-up agreements with the underwriters under which they have agreed, subject to specific exceptions, not to sell any of our stock for at least 180 days following the date of this prospectus. As a result of these agreements and the provisions of our Investors Rights Agreement described above in the section titled "Description of Capital Stock—Registration Rights," subject to the provisions of Rule 144 or Rule 701, based on an assumed initial offering price date of , shares will be available for sale in the public market as follows:

- beginning on the date of this prospectus, the shares of common stock sold in this offering will be immediately available for sale in the public market;
- beginning 90 days after the date of this prospectus, additional shares of common stock may become eligible for sale in the public market upon the satisfaction of certain conditions as set forth in "Lock-Up Agreements," of which shares would be held by affiliates and subject to the volume and other restrictions of Rule 144, as described below;
- beginning 181 days after the date of this prospectus, additional shares of common stock will become eligible for sale in the public market, of which shares will be held by affiliates and subject to the volume and other restrictions of Rule 144, as described below; and
- the remainder of the shares of common stock will be eligible for sale in the public market from time to time thereafter, subject in some cases to the volume and other restrictions of Rule 144, as described below.

Lock-up Agreements

In connection with this offering, we, and all of our directors and officers, and the holders of substantially all of our outstanding stock and stock options have agreed that, without the prior written

consent of Cowen and Company, LLC and Piper Jaffray & Co. on behalf of the underwriters, we and they will not, during the period ending 180 days after the date of this prospectus (the "restricted period"):

- offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for our common stock; or

- enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of our common stock,

whether any such transaction described above is to be settled by delivery of common stock or such other securities, in cash or otherwise. In addition, we and all of our directors and officers, and the holders of substantially all of our common stock and stock options have agreed that, without the prior written consent of Cowen and Company, LLC and Piper Jaffray & Co. on behalf of the underwriters, during the restricted period, no registration statement with the SEC relating to the offering of any shares of common stock or any security convertible into or exercisable or exchangeable for our common stock will be filed.

Following the lock-up periods set forth in the agreements described above, all of the shares of our common stock that are restricted securities or are held by our affiliates as of the date of this prospectus will be eligible for sale in the public market in compliance with Rule 144 under the Securities Act.

In addition to the restrictions contained in the lock-up agreements described above, we have entered into agreements with certain of our security holders, including our amended and restated investors rights agreement and the standard forms of our option agreements under our equity incentive plans that contain market stand-off provisions imposing restrictions on the ability of such security holders to offer, sell or transfer our equity securities for a period of 180 days following the date of this prospectus.

Rule 144

Affiliate Resales of Restricted Securities

In general, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is an affiliate of ours, or who was an affiliate at any time during the 90 days before a sale, who has beneficially owned shares of our common stock for at least six months would be entitled to sell in "broker's transactions" or certain "riskless principal transactions" or to market makers, a number of shares within any three-month period that does not exceed the greater of:

- 1% of the number of shares of our common stock then outstanding, which will equal approximately shares immediately after this offering; or

- the average weekly trading volume in our common stock on The NASDAQ Global Market during the four calendar weeks preceding the filing of a notice on Form 144 with respect to such sale.

Affiliate resales under Rule 144 are also subject to the availability of current public information about us. In addition, if the number of shares being sold under Rule 144 by an affiliate during any three-month period exceeds 5,000 shares or has an aggregate sale price in excess of $50,000, the seller must file a notice on Form 144 with the Securities and Exchange Commission and concurrently with either the placing of a sale order with the broker or the execution directly with a market maker.

In general, under Rule 144 as currently in effect, once we have been subject to the public company reporting requirements of Section 13 or Section 15(d) of the Exchange Act for at least 90 days, a

person who is not deemed to have been one of our affiliates for purposes of the Securities Act at any time during the 90 days preceding a sale and who has beneficially owned the shares proposed to be sold for at least six months, including the holding period of any prior owner other than our affiliates, is entitled to sell those shares without complying with the manner of sale, volume limitation or notice provisions of Rule 144, subject to compliance with the public information requirements of Rule 144. If such a person has beneficially owned the shares proposed to be sold for at least one year, including the holding period of any prior owner other than our affiliates, then that person would be entitled to sell those shares without complying with any of the requirements of Rule 144.

Rule 701

Rule 701 generally allows a stockholder who purchased shares of our common stock pursuant to a written compensatory plan or contract and who is not deemed to have been an affiliate of our company during the immediately preceding 90 days to sell these shares in reliance upon Rule 144, but without being required to comply with the public information, holding period, volume limitation or notice provisions of Rule 144. Rule 701 also permits affiliates of our company to sell their Rule 701 shares under Rule 144 without complying with the holding period requirements of Rule 144. All holders of Rule 701 shares, however, are required by that rule to wait until 90 days after the date of this prospectus before selling those shares pursuant to Rule 701.

Registration Rights

Upon the completion of this offering, the holders of shares of our common stock issued or issuable will be entitled to specified rights with respect to the registration of the offer and sale of their shares under the Securities Act. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act immediately upon the effectiveness of the registration statement. See the section titled "Description of Capital Stock—Registration Rights" for additional information.

Equity Incentive Plans

As soon as practicable after the completion of this offering, we intend to file a Form S-8 registration statement under the Securities Act to register shares of our common stock subject to options outstanding or reserved for issuance under our stock plans. This registration statement will become effective immediately upon filing, and shares covered by this registration statement will thereupon be eligible for sale in the public markets, subject to Rule 144 limitations applicable to affiliates and any lock-up agreements. For a more complete discussion of our stock plans, see the section titled "Executive Compensation—Stock Option Plans."

CERTAIN MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES

The following is a summary of the material U.S. federal income and estate tax considerations relating to the purchase, ownership and disposition of our common stock by Non-U.S. Holders (defined below). This summary does not purport to be a complete analysis of all the potential tax considerations relevant to Non-U.S. Holders of our common stock. This summary is based upon the Code, the Treasury regulations promulgated or proposed thereunder and administrative and judicial interpretations thereof, all as of the date hereof and all of which are subject to differing interpretations and to change at any time, possibly on a retroactive basis.

This summary assumes that shares of our common stock are held as "capital assets" within the meaning of Section 1221 of the Code (generally, property held for investment). This summary does not purport to deal with all aspects of U.S. federal income and estate taxation that might be relevant to particular Non-U.S. Holders in light of their particular investment circumstances or status, nor does it address specific tax considerations that may be relevant to particular persons (including, for example, financial institutions, broker-dealers, insurance companies, partnerships or other pass-through entities, certain U.S. expatriates, tax-exempt organizations, pension plans, "controlled foreign corporations", "passive foreign investment companies", corporations that accumulate earnings to avoid U.S. federal income tax, persons in special situations, such as those who have elected to mark securities to market or those who hold common stock as part of a straddle, hedge, conversion transaction, synthetic security or other integrated investment, holders who have acquired our common stock pursuant to the exercise of a stock option or otherwise as compensation, or holders subject to the alternative minimum tax or the 3.8% Medicare tax on net investment income). In addition, except as explicitly addressed herein with respect to estate tax, this summary does not address estate and gift tax considerations or considerations under the tax laws of any state, local or non-U.S. jurisdiction.

For purposes of this summary, a "Non-U.S. Holder" means a beneficial owner of common stock that for U.S. federal income tax purposes is not an entity treated as a partnership and is not:

- an individual who is a citizen or resident of the United States;
- a corporation or any other organization taxable as a corporation for U.S. federal income tax purposes, created or organized in or under the laws of the United States, any state thereof or the District of Columbia;
- an estate, the income of which is included in gross income for U.S. federal income tax purposes regardless of its source; or
- a trust if (1) a U.S. court is able to exercise primary supervision over the trust's administration and one or more U.S. persons have the authority to control all of the trust's substantial decisions or (2) the trust has a valid election in effect under applicable Treasury regulations to be treated as a U.S. person.

If an entity that is treated as a partnership for U.S. federal income tax purposes holds our common stock, the tax treatment of persons treated as its partners for U.S. federal income tax purposes will generally depend upon the status of the partner and the activities of the partnership. Entities that are treated as partnerships for U.S. federal income tax purposes and persons holding our common stock through an entity treated as a partnership for U.S. federal income tax purposes are urged to consult their own tax advisors.

There can be no assurance that the Internal Revenue Service ("IRS") will not challenge one or more of the tax consequences described herein, and we have not obtained, nor do we intend to obtain a ruling from the IRS with respect to the U.S. federal income or estate tax consequences to a Non-U.S. Holder of the purchase, ownership or disposition of our common stock.

THIS SUMMARY IS NOT INTENDED TO BE TAX ADVICE. NON-U.S. HOLDERS ARE URGED TO CONSULT THEIR TAX ADVISORS CONCERNING THE U.S. FEDERAL INCOME AND ESTATE TAXATION, STATE, LOCAL AND NON-U.S. TAXATION AND OTHER TAX CONSEQUENCES TO THEM OF THE PURCHASE, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK.

Distributions on Our Common Stock

Dividends paid to a Non-U.S. Holder generally will be subject to a 30% U.S. federal withholding tax unless such Non-U.S. Holder provides us or another applicable withholding agent, as the case may be, with the appropriate IRS Form W-8, such as:

- IRS Form W-8BEN (or successor form) certifying, under penalties of perjury, that such holder is not a United States person (as defined under the Code) and is eligible for a reduction in the rate of, or exemption from, withholding under an applicable income tax treaty, or

- IRS Form W-8ECI (or successor form) certifying that a dividend paid on common stock is not subject to withholding tax because it is effectively connected with a trade or business in the United States of the Non-U.S. Holder (in which case such dividend generally will be subject to regular graduated U.S. tax rates as described below).

The certification requirement described above must be provided to us or another applicable withholding agent prior to the payment of dividends and must be updated periodically. The certification also may require a Non-U.S. Holder that claims treaty benefits of a reduction in the rate of, or exemption from, withholding on dividends to provide its U.S. taxpayer identification number. Special certification and other requirements apply in the case of certain Non-U.S. Holders that hold shares of our common stock through intermediaries or are pass-through entities for U.S. federal income tax purposes.

Each Non-U.S. Holder is urged to consult its own tax advisor about the specific methods for satisfying these requirements. A claim for exemption will not be valid if the person receiving the applicable form has actual knowledge or reason to know that the statements on the form are false.

If dividends are effectively connected with a trade or business in the United States of a Non-U.S. Holder (and, if required by an applicable income tax treaty, attributable to a U.S. permanent establishment or fixed base), the Non-U.S. Holder, although exempt from the withholding tax described above (provided that the certifications described above are satisfied), generally will be subject to U.S. federal income tax on such dividends on a net income basis in the same manner as if it were a U.S. person. In addition, if a Non-U.S. Holder is treated as a corporation for U.S. federal income tax purposes, the Non-U.S. Holder may be subject to an additional "branch profits tax" equal to 30% (unless reduced by an applicable income tax treaty) of such effectively connected dividend, as adjusted for certain items.

Non-U.S. Holders that do not timely provide us or another applicable withholding agent with the required certification, but which are eligible for a reduced rate of, or an exemption from, U.S. federal withholding tax, may obtain a refund or credit of any excess amount withheld by timely filing an appropriate claim for refund with the IRS.

Gain on Sale, Exchange or Other Taxable Disposition of Our Common Stock

Subject to the discussion below under the sections titled "—Additional Withholding and Reporting Requirements" and "—Backup Withholding and Information Reporting", in general, a Non-U.S. Holder will not be subject to U.S. federal income tax or withholding tax on gain realized upon such holder's sale, exchange or other taxable disposition of shares of our common stock unless (i) such Non-U.S. Holder is an individual who is present in the United States for 183 days or more in the taxable year of disposition, and certain other conditions are met; (ii) we are or have been a "United

States real property holding corporation", as defined in the Code (a "USRPHC"), at any time within the shorter of the five-year period preceding the disposition and the Non-U.S. Holder's holding period in the shares of our common stock, and certain other requirements are met; or (iii) such gain is effectively connected with the conduct by such Non-U.S. Holder of a trade or business in the United States (and, if required by an applicable income tax treaty, is attributable to a permanent establishment or fixed base maintained by such Non-U.S. Holder in the United States).

If the first exception applies, the Non-U.S. Holder generally will be subject to U.S. federal income tax at a rate of 30% (or at a reduced rate under an applicable income tax treaty) on the amount by which such Non-U.S. Holder's capital gains allocable to U.S. sources exceed capital losses allocable to U.S. sources during the taxable year of the disposition. If the third exception applies, the Non-U.S. Holder generally will be subject to U.S. federal income tax with respect to such gain on a net income basis in the same manner as if it were a U.S. person, and a Non-U.S. Holder that is a corporation for U.S. federal income tax purposes may also be subject to a branch profits tax with respect to such effectively connected gain, as adjusted for certain items, at a rate of 30% (or at a reduced rate under an applicable income tax treaty).

Regarding the second exception, generally, a corporation is a USRPHC only if the fair market value of its U.S. real property interests (as defined in the Code) equals or exceeds 50% of the sum of the fair market value of its worldwide real property interests plus its other assets used or held for use in a trade or business. Although there can be no assurance in this regard, we believe that we are not, and do not anticipate becoming, a USRPHC. However, because the determination of whether we are a USRPHC depends on the fair market value of our U.S. real property interests relative to the fair market value of our other business assets, there can be no assurance that we have not been a USRPHC in the past and will not become a USRPHC in the future. Even if we became a USRPHC, a Non-U.S. Holder would not be subject to U.S. federal income tax on a sale, exchange or other taxable disposition of our common stock by reason of our status as USRPHC so long as our common stock is regularly traded on an established securities market (within the meaning of the applicable regulations) and such Non-U.S. Holder does not own and is not deemed to own (directly, indirectly or constructively) more than 5% of our outstanding common stock at any time during the shorter of the five year period ending on the date of disposition and such holder's holding period. However, no assurance can be provided that our common stock will be regularly traded on an established securities market for purposes of the rules described above. Prospective investors are encouraged to consult their own tax advisors regarding the possible consequences to them if we are, or were to become, a USRPHC.

Additional Withholding and Reporting Requirements

Legislation enacted in March 2010 and related guidance (commonly referred to as "FATCA") will impose, in certain circumstances, a U.S. federal withholding tax at a rate of 30% on payments of (a) dividends on our common stock, and (b) gross proceeds from the sale or other disposition of our common stock on or after January 1, 2017. In the case of payments made to a "foreign financial institution" as defined under FATCA (including, among other entities, an investment fund), the tax generally will be imposed, subject to certain exceptions, unless such institution (i) enters into (or is otherwise subject to) and complies with an agreement with the U.S. government (a "FATCA Agreement") or (ii) complies with an applicable intergovernmental agreement between the United States and a foreign jurisdiction (an "IGA") or any foreign law implementing an applicable IGA, in either case to, among other things, collect and provide to the U.S. or other relevant tax authorities certain information regarding U.S. account holders of such institution. In the case of payments made to a foreign entity that is not a foreign financial institution, the tax generally will be imposed, subject to certain exceptions, unless such foreign entity provides the withholding agent with a certification that it does not have any "substantial U.S. owners" (generally, any specified U.S. persons that directly or indirectly own more than a specified percentage of such entity) or that identifies its substantial U.S.

owners. If our common stock is held through a foreign financial institution that enters into (or is otherwise subject to) a FATCA Agreement, such foreign financial institution (or, in certain cases, a person paying amounts to such foreign financial institution) generally will be required, subject to certain exceptions, to apply FATCA withholding on payments of dividends and proceeds described above made to (x) a person (including an individual) that fails to comply with certain information requests or (y) a foreign financial institution that has not entered into a FATCA Agreement and is not otherwise exempt from FATCA pursuant to an IGA.

Prospective investors should consult their own tax advisors regarding the possible impact of these rules on their investment in our common stock, and the entities through which they hold our common stock, including, without limitation, the process and deadlines for meeting the applicable requirements to prevent the imposition of this 30% withholding tax under FATCA.

Backup Withholding and Information Reporting

We must report annually to the IRS and to each Non-U.S. Holder the gross amount of the distributions on our common stock paid to the holder and the tax withheld, if any, with respect to the distributions. Non-U.S. Holders may have to comply with specific certification procedures to establish that the holder is not a United States person (as defined in the Code) in order to avoid backup withholding at the applicable rate, currently 28%, with respect to dividends on our common stock. Dividends paid to Non-U.S. Holders subject to U.S. withholding, as described above under the section titled "—Distributions on Our Common Stock", generally will be exempt from U.S. backup withholding.

Information reporting and backup withholding will generally apply to the proceeds of a disposition of our common stock by a Non-U.S. Holder effected by or through the U.S. office of any broker, U.S. or foreign, unless the holder certifies, under penalties of perjury, that it is not a United States person (as defined under the Code) and satisfies certain other requirements (and the payor does not have actual knowledge or reason to know that the beneficial owner is a United States person), or otherwise establishes an exemption. Generally, information reporting and backup withholding will not apply to a payment of disposition proceeds to a Non-U.S. Holder where the transaction is effected outside the United States through a non-U.S. office of a broker. However, for information reporting purposes, dispositions effected through a non-U.S. office of a broker with substantial U.S. ownership or operations generally will be treated in a manner similar to dispositions effected through a U.S. office of a broker. Prospective investors should consult their own tax advisors regarding the application of the information reporting and backup withholding rules to them.

Copies of information returns may be made available to the tax authorities of the country in which the Non-U.S. Holder resides or in which the Non-U.S. Holder is incorporated, under the provisions of a specific treaty or agreement.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules from a payment to a Non-U.S. Holder can be refunded or credited against the Non-U.S. Holder's U.S. federal income tax liability, if any, provided that an appropriate claim is timely filed with the IRS.

Federal Estate Tax

Common stock owned (or treated as owned) by an individual who is not a citizen or a resident of the United States (as defined for U.S. federal estate tax purposes) at the time of death will be included in the individual's gross estate for U.S. federal estate tax purposes unless an applicable estate or other tax treaty provides otherwise, and therefore, may be subject to U.S. federal estate tax.

UNDERWRITING

We and the underwriters for the offering named below have entered into an underwriting agreement with respect to the shares of common stock being offered. Subject to the terms and conditions of the underwriting agreement, each underwriter has severally agreed to purchase from us the number of shares of common stock set forth opposite its name below. Cowen and Company, LLC and Piper Jaffray & Co. are the representatives of the underwriters.

Underwriter	Number of Shares
Cowen and Company, LLC	
Piper Jaffray & Co.	
Nomura Securities International, Inc.	
Sanford C. Bernstein & Co., LLC	
Total	

The underwriting agreement provides that the obligations of the underwriters are subject to certain conditions precedent and that the underwriters have agreed, severally and not jointly, to purchase all of the shares of common stock sold under the underwriting agreement if any of these shares are purchased, other than those shares covered by the overallotment option described below. If an underwriter defaults, the underwriting agreement provides that the purchase commitments of the non-defaulting underwriters may be increased or the underwriting agreement may be terminated.

We have agreed to indemnify the underwriters against specified liabilities, including liabilities under the Securities Act, and to contribute to payments the underwriters may be required to make in respect thereof.

The underwriters are offering the shares of common stock, subject to prior sale, when, as and if issued to and accepted by them, subject to approval of legal matters by their counsel and other conditions specified in the underwriting agreement. The underwriters reserve the right to withdraw, cancel or modify offers to the public and to reject orders in whole or in part.

Overallotment Option to Purchase Additional Shares

We have granted to the underwriters an option to purchase up to additional shares of common stock at the public offering price, less the underwriting discount, in this offering of common stock. This option is exercisable for a period of 30 days. The underwriters may exercise this option solely for the purpose of covering overallotments, if any, made in connection with the sale of common stock offered hereby. To the extent that the underwriters exercise this option, the underwriters will purchase additional shares from us in approximately the same proportion as shown in the table above.

Discounts and Commissions

The following table shows the public offering price, underwriting discount and proceeds, before expenses to us. These amounts are shown assuming both no exercise and full exercise of the underwriters' overallotment option.

We estimate that the total expenses of this offering of common stock, excluding underwriting discounts and commissions, will be approximately $ and are payable by us. We have also agreed to reimburse the underwriters for certain of their expenses as set forth in the underwriting agreement, including legal fees incurred in the qualification of this offering and the concurrent offering of notes

with the Financial Regulatory Authority, or FINRA, in an amount of up to $, which amount is deemed to be underwriting compensation by FINRA.

	Per Share	Total Without Overallotment	Total With Overallotment
Initial public offering price			
Underwriting discounts and commissions			
Proceeds, before expenses, to Voyager			

The underwriters propose to offer the shares of common stock to the public at the public offering price set forth on the cover of this prospectus. The underwriters may offer the shares of common stock to securities dealers at the public offering price less a concession not in excess of $ per share. If all of the shares are not sold at the public offering price, the underwriters may change the offering price and other selling terms. Sales of shares of common stock made outside of the United States may be made by affiliates of certain of the underwriters. Certain of the underwriters may sell shares to the public through one or more of their affiliates as selling agents.

Discretionary Accounts

The underwriters do not intend to confirm sales of the shares of common stock to any accounts over which they have discretionary authority.

Market Information

Prior to this offering, there has been no public market for shares of our common stock. The initial public offering price will be determined by negotiations between us and the representatives of the underwriters. In addition to prevailing market conditions, the factors to be considered in these negotiations include:

- the history of, and prospects for, our company and the industry in which we compete;
- our past and present financial information;
- an assessment of our management; its past and present operations, and the prospects for, and timing of, our future revenues;
- the present state of our development; and
- the above factors in relation to market values and various valuation measures of other companies engaged in activities similar to ours.

An active trading market for our common stock may not develop, of if such a market develops, may not be sustained. It is also possible that after the offering the shares will not trade in the public market at or above the initial public offering price.

We intend to apply to list our common stock on The NASDAQ Global Market under the symbol "VYGR."

Price Stabilization, Short Positions and Penalty Bids

In connection with this offering of common stock, the underwriters may engage in stabilizing transactions, overallotment transactions, syndicate covering transactions, penalty bids and purchases to cover positions created by short sales.

- Stabilizing transactions permit bids to purchase shares of common stock so long as the stabilizing bids do not exceed a specified maximum, and are engaged in for the purpose of preventing or retarding a decline in the market price of the common stock while the offering is in progress.

- Overallotment transactions involve sales by the underwriters of shares of common stock in excess of the number of shares the underwriters are obligated to purchase. This creates a syndicate short position which may be either a covered short position or a naked short position. In a covered short position, the number of shares over-allotted by the underwriters is not greater than the number of shares that they may purchase in the overallotment option. In a naked short position, the number of shares involved is greater than the number of shares in the overallotment option. The underwriters may close out any short position by exercising their overallotment option and/or purchasing shares in the open market.

- Syndicate covering transactions involve purchases of common stock in the open market after the distribution has been completed in order to cover syndicate short positions. In determining the source of shares to close out the short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market as compared with the price at which they may purchase shares through exercise of the overallotment option. If the underwriters sell more shares than could be covered by exercise of the overallotment option and, therefore, have a naked short position, the position can be closed out only by buying shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that after pricing there could be downward pressure on the price of the shares in the open market that could adversely affect investors who purchase in the offering.

- Penalty bids permit the representatives to reclaim a selling concession from a syndicate member when the common stock originally sold by that syndicate member is purchased in stabilizing or syndicate covering transactions to cover syndicate short positions.

These stabilizing transactions, syndicate covering transactions and penalty bids may have the effect of raising or maintaining the market price of our common stock or preventing or retarding a decline in the market price of our common stock. As a result, the price of our common stock in the open market may be higher than it would otherwise be in the absence of these transactions. Neither we nor the underwriters make any representation or prediction as to the effect that the transactions described above may have on the price of shares of our common stock. These transactions may be effected on The NASDAQ Global Market, in the over-the-counter market or otherwise and, if commenced, may be discontinued at any time.

Lock-Up Agreements

Pursuant to certain "lock-up" agreements, we and our executive officers, directors and certain of our other stockholders, have agreed, subject to certain exceptions, not to offer, sell, assign, transfer, pledge, contract to sell, or otherwise dispose of or announce the intention to otherwise dispose of, or enter into any swap, hedge or similar agreement or arrangement that transfers, in whole or in part, the economic consequence of ownership of, directly or indirectly, or make any demand or request or exercise any right with respect to the registration of, or file with the SEC a registration statement under the Securities Act relating to, any common stock or securities convertible into or exchangeable or exercisable for any common stock without the prior written consent of Cowen and Company, LLC and Piper Jaffray & Co., for a period of 180 days after the date of the underwriting agreement.

This lock-up provision applies to common stock and to securities convertible into or exchangeable or exercisable for common stock. It also applies to common stock owned now or acquired later by the person executing the agreement or for which the person executing the agreement later acquires the power of disposition. The lock-up agreements include customary exceptions.

Cowen and Company, LLC and Piper Jaffray & Co., in their sole discretion, may release our common stock and other securities subject to the lock-up agreements described above in whole or in part at any time. When determining whether or not to release our common stock and other securities from lock-up agreements, Cowen and Company, LLC and Piper Jaffray & Co. will consider, among other factors, the holder's reasons for requesting the release, the number of shares for which the release is being requested and market conditions at the time of the request. In the event of such a release or waiver for one of our directors or officers, Cowen and Company, LLC and Piper Jaffray & Co. shall provide us with notice of the impending release or waiver at least three business days before the effective date of such release or waiver and we will announce the impending release or waiver by issuing a press release at least two business days before the effective date of the release or waiver.

Electronic Offer, Sale and Distribution of Shares

A prospectus in electronic format may be made available on the websites maintained by one or more of the underwriters or selling group members, if any, participating in this offering and one or more of the underwriters participating in this offering may distribute prospectuses electronically. The representatives may agree to allocate a number of shares to underwriters and selling group members for sale to their online brokerage account holders. Internet distributions will be allocated by the underwriters and selling group members that will make internet distributions on the same basis as other allocations. Other than the prospectus in electronic format, the information on these websites is not part of this prospectus or the registration statement of which this prospectus forms a part, has not been approved or endorsed by us or any underwriter in its capacity as underwriter, and should not be relied upon by investors.

Other Relationships

Certain of the underwriters and their affiliates have provided, and may in the future provide, various investment banking, commercial banking and other financial services for us and our affiliates for which they have received, and may in the future receive, customary fees.

Selling Restrictions

No action has been taken in any jurisdiction except the United States that would permit a public offering of our common stock, or the possession, circulation or distribution of this prospectus or any other material relating to us or our common stock in any jurisdiction where action for that purpose is required. Accordingly, the shares may not be offered or sold, directly or indirectly, and neither this prospectus nor any other offering material or advertisements in connection with the shares may be distributed or published, in or from any country or jurisdiction except in compliance with any applicable rules and regulations of any such country or jurisdiction.

United Kingdom

Each of the underwriters has, separately and not jointly, represented and agreed that:

- it has not made or will not make an offer of the securities to the public in the United Kingdom within the meaning of section 102B of the Financial Services and Markets Act 2000 (as amended), or the FSMA, except to legal entities which are authorized or regulated to operate in the financial markets or, if not so authorized or regulated, whose corporate purpose is solely to invest in securities or otherwise in circumstances which do not require the publication by us of a prospectus pursuant to the Prospectus Rules of the Financial Services Authority, or FSA;

- it has only communicated or caused to be communicated and will only communicate or cause to be communicated an invitation or inducement to engage in investment activity (within the

meaning of section 21 of FSMA) to persons who have professional experience in matters relating to investments falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 or in circumstances in which section 21 of FSMA does not apply to us; and

- it has complied with and will comply with all applicable provisions of FSMA with respect to anything done by it in relation to the securities in, from or otherwise involving the United Kingdom.

Switzerland

The securities will not be offered, directly or indirectly, to the public in Switzerland and this prospectus does not constitute a public offering prospectus as that term is understood pursuant to article 652a or 1156 of the Swiss Federal Code of Obligations.

Israel

In the State of Israel this prospectus shall not be regarded as an offer to the public to purchase shares of common stock under the Israeli Securities Law, 5728 – 1968, which requires a prospectus to be published and authorized by the Israel Securities Authority, if it complies with certain provisions of Section 15 of the Israeli Securities Law, 5728 – 1968, including, inter alia, if: (i) the offer is made, distributed or directed to not more than 35 investors, subject to certain conditions (the "Addressed Investors"); or (ii) the offer is made, distributed or directed to certain qualified investors defined in the First Addendum of the Israeli Securities Law, 5728 – 1968, subject to certain conditions (the "Qualified Investors"). The Qualified Investors shall not be taken into account in the count of the Addressed Investors and may be offered to purchase securities in addition to the 35 Addressed Investors. The company has not and will not take any action that would require it to publish a prospectus in accordance with and subject to the Israeli Securities Law, 5728 – 1968. We have not and will not distribute this prospectus or make, distribute or direct an offer to subscribe for our common stock to any person within the State of Israel, other than to Qualified Investors and up to 35 Addressed Investors.

Qualified Investors may have to submit written evidence that they meet the definitions set out in of the First Addendum to the Israeli Securities Law, 5728 – 1968. In particular, we may request, as a condition to be offered common stock, that Qualified Investors will each represent, warrant and certify to us and/or to anyone acting on our behalf: (i) that it is an investor falling within one of the categories listed in the First Addendum to the Israeli Securities Law, 5728 – 1968; (ii) which of the categories listed in the First Addendum to the Israeli Securities Law, 5728 – 1968 regarding Qualified Investors is applicable to it; (iii) that it will abide by all provisions set forth in the Israeli Securities Law, 5728 – 1968 and the regulations promulgated thereunder in connection with the offer to be issued common stock; (iv) that the shares of common stock that it will be issued are, subject to exemptions available under the Israeli Securities Law, 5728 – 1968: (a) for its own account; (b) for investment purposes only; and (c) not issued with a view to resale within the State of Israel, other than in accordance with the provisions of the Israeli Securities Law, 5728 – 1968; and (v) that it is willing to provide further evidence of its Qualified Investor status. Addressed Investors may have to submit written evidence in respect of their identity and may have to sign and submit a declaration containing, inter alia, the Addressed Investor's name, address and passport number or Israeli identification number.

European Economic Area

In relation to each Member State of the European Economic Area, or the EEA, which has implemented the European Prospectus Directive (each, a "Relevant Member State"), an offer of our shares may not be made to the public in a Relevant Member State other than:

- to any legal entity which is a qualified investor, as defined in the European Prospectus Directive;
- to fewer than 100 or, if the Relevant Member State has implemented the relevant provision of the 2010 PD Amending Directive, 150 natural or legal persons (other than qualified investors as defined in the European Prospectus Directive), subject to obtaining the prior consent of the relevant dealer or dealers nominated by us for any such offer, or
- in any other circumstances falling within Article 3(2) of the European Prospectus Directive,

provided that no such offer of our shares shall require us or any underwriter to publish a prospectus pursuant to Article 3 of the European Prospectus Directive or supplement prospectus pursuant to Article 16 of the European Prospectus Directive.

For the purposes of this description, the expression an "offer to the public" in relation to the securities in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and the securities to be offered so as to enable an investor to decide to purchase or subscribe for the securities, as the expression may be varied in that Relevant Member State by any measure implementing the European Prospectus Directive in that member state, and the expression "European Prospectus Directive" means Directive 2003/71/EC (and amendments hereto, including the 2010 PD Amending Directive, to the extent implemented in the Relevant Member State) and includes any relevant implementing measure in each Relevant Member State. The expression 2010 PD Amending Directive means Directive 2010/73/EU.

We have not authorized and do not authorize the making of any offer of securities through any financial intermediary on our behalf, other than offers made by the underwriters and their respective affiliates, with a view to the final placement of the securities as contemplated in this document. Accordingly, no purchaser of the shares, other than the underwriters, is authorized to make any further offer of shares on our behalf or on behalf of the underwriters.

LEGAL MATTERS

Goodwin Procter LLP, Boston, Massachusetts, which has acted as our counsel in connection with this offering, will pass upon the validity of the shares of common stock being offered by this prospectus. The underwriters have been represented in this offering by Cooley LLP.

EXPERTS

The financial statements of Voyager Therapeutics, Inc. at December 31, 2014 and 2013, and for each of the two periods in the period ended December 31, 2014, appearing in this Prospectus and Registration Statement have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their report thereon appearing elsewhere herein, and are included in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

ADDITIONAL INFORMATION

We have filed with the SEC a registration statement on Form S-1 under the Securities Act with respect to the shares of common stock offered by this prospectus. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement, some of which is contained in exhibits to the registration statement as permitted by the rules and regulations of the SEC. For further information with respect to us and our common stock, we refer you to the registration statement, including the exhibits filed as a part of the registration statement. Statements contained in this prospectus concerning the contents of any contract or any other document are not necessarily complete. If a contract or document has been filed as an exhibit to the registration statement, please see the copy of the contract or document that has been filed. Each statement in this prospectus relating to a contract or document filed as an exhibit is qualified by the filed exhibit. You may obtain copies of this information by mail from the Public Reference Section of the SEC, 100 F Street, N.E., Room 1580, Washington, D.C. 20549, at prescribed rates. You may obtain information on the operation of the public reference rooms by calling the SEC at 1-800-SEC-0330. The SEC also maintains an Internet website that contains reports, proxy statements and other information about issuers, like us, that file electronically with the SEC. The address of that website is www.sec.gov.

As a result of this offering, we will become subject to the information and reporting requirements of the Exchange Act and, in accordance with this law, will file periodic reports, proxy statements and other information with the SEC. These periodic reports, proxy statements and other information will be available for inspection and copying at the SEC's public reference facilities and the website of the SEC referred to above. We also maintain a website at www.voyagertherapeutics.com. Upon completion of this offering, you may access these materials free of charge as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC. Information contained on our website is not a part of this prospectus and the inclusion of our website address in this prospectus is an inactive textual reference only.

Voyager Therapeutics, Inc.

Index to Financial Statements

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders of
Voyager Therapeutics, Inc.

We have audited the accompanying balance sheets of Voyager Therapeutics, Inc. (the "Company") as of December 31, 2014 and 2013, and the related statements of operations, redeemable convertible preferred stock and stockholders' equity (deficit), and cash flows for the periods then ended. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. We were not engaged to perform an audit of the Company's internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Voyager Therapeutics, Inc. at December 31, 2014 and 2013, and the results of its operations and its cash flows for the periods then ended, in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP

Boston, Massachusetts
June 19, 2015

Voyager Therapeutics, Inc.

Balance Sheets

(amounts in thousands, except share and per share data)

	December 31, 2013	December 31, 2014	March 31, 2015 (unaudited)	Pro Forma March 31, 2015 (unaudited)
Assets				
Current assets:				
Cash and cash equivalents	$ 135	$ 7,035	$ 116,414	$ 116,414
Prepaid expenses and other current assets	—	1,323	691	691
Total current assets	135	8,358	117,105	117,105
Property and equipment, net	—	2,804	2,841	2,841
Deposits and other non-current assets	14	335	386	386
Total assets	$ 149	$ 11,497	$ 120,332	$ 120,332
Liabilities, redeemable convertible preferred stock and stockholders' equity (deficit)				
Current liabilities:				
Accounts payable	$ 950	$ 1,554	$ 1,597	$ 1,597
Accrued expenses	105	642	824	824
Convertible promissory notes payable	2,927	—	—	—
Deferred rent, current portion	—	278	283	283
Deferred revenue, current portion	—	—	19,589	19,589
Total current liabilities	3,982	2,474	22,293	22,293
Deferred rent, net of current portion	—	1,314	1,242	1,242
Deferred revenue, net of current portion	—	—	48,842	48,842
Other non-current liabilities	—	255	78	78
Preferred stock tranche liability	—	6,305	—	—
Total liabilities	3,982	10,348	72,455	72,455
Commitments and contingencies (see note 8)				
Redeemable convertible preferred stock (Series A), $0.001 par value: 0, 45,000,000 and 45,000,000 shares authorized at December 31, 2013 and 2014, and March 31, 2015 (unaudited), respectively; 0, 25,000,000 and 45,000,000 shares issued and outstanding at December 31, 2013 and 2014, and March 31, 2015 (unaudited), respectively; aggregate liquidation preference of $0, $26,086, and $46,816 at December 31, 2013 and 2014, and March 31, 2015 (unaudited), respectively; no shares issued and outstanding at March 31, 2015, pro forma (unaudited)	—	21,979	58,632	—
Redeemable convertible preferred stock (Series B), $0.001 par value: 0, 0 and 10,000,000 shares authorized at December 31, 2013 and 2014, and March 31, 2015 (unaudited), respectively; 10,000,000 shares issued and outstanding at March 31, 2015 (unaudited); aggregate liquidation preference of $30,322 at March 31, 2015 (unaudited); no shares issued and outstanding at March 31, 2015 pro forma (unaudited)	—	—	25,342	—
Stockholders' equity (deficit):				
Common stock, $.001 par value: 10,000, 65,000,000, and 75,000,000 shares authorized; 10,000, 3,463,092 and 4,539,696 shares issued and outstanding at December 31, 2013 and 2014, and March 31, 2015 (unaudited), respectively; 59,539,696 shares issued and outstanding at March 31, 2015 pro forma (unaudited)	—	3	5	60
Additional paid-in capital	—	—	—	82,544
Accumulated deficit	(3,833)	(20,833)	(36,102)	(34,727)
Total stockholders' equity (deficit)	(3,833)	(20,830)	(36,097)	47,877
Total liabilities, redeemable convertible preferred stock and stockholders' equity (deficit)	$ 149	$ 11,497	$ 120,332	$ 120,332

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

Voyager Therapeutics, Inc.

Statements of Operations

(amounts in thousands, except per share and share data)

	Period from June 19, 2013 (inception) to December 31, 2013	Year Ended December 31, 2014	Three Months Ended March 31,	
			2014	2015
			(unaudited)	
Collaboration revenue	$ —	$ —	$ —	$ 2,576
Operating expenses:				
Research and development	2,316	8,898	1,432	5,523
General and administrative	1,450	5,469	1,553	1,881
Total operating expenses	3,766	14,367	2,985	7,404
Operating loss	(3,766)	(14,367)	(2,985)	$ (4,828)
Other expense, net				
Interest income (expense), net	(67)	(1)	(2)	1
Other financing expense	—	(1,949)	(65)	(9,750)
Total other expense, net	(67)	(1,950)	(67)	(9,749)
Net loss	$ (3,833)	$ (16,317)	$ (3,052)	$ (14,577)
Reconciliation of net loss to net loss attributable to common stockholders:				
Net loss	$ (3,833)	$ (16,317)	$ (3,052)	$ (14,577)
Accretion of redeemable convertible preferred stock to redemption value		(1,366)	(159)	(999)
Accrued dividends on Series A redeemable convertible preferred stock	—	—	—	(237)
Net loss attributable to common stockholders	$ (3,833)	$ (17,683)	$ (3,211)	$ (15,813)
Net loss per share attributable to common stockholders, basic and diluted	$ (383.30)	$ (6.55)	$ (1.63)	$ (3.72)
Weighted-average common shares outstanding, basic and diluted	10,000	2,700,696	1,968,333	4,255,824
Pro forma net loss per share, basic and diluted (unaudited)		$ (0.88)		$ (0.10)
Pro forma weighted-average common shares outstanding, basic and diluted (unaudited)		16,297,956		46,700,268

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

Voyager Therapeutics, Inc.

Statements of Redeemable Convertible Preferred Stock and Stockholders' Equity (Deficit)

(amounts in thousands except share and per share data)

	Series A Redeemable Convertible Preferred Stock		Series B Redeemable Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Accumulated Deficit	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount	Shares	Amount			
Balance at June 19, 2013 (inception)	—	$ —	—	$ —	—	$ —	$ —	$ —	$ —
Issuance of common stock	—	—	—		10,000	—	—	—	—
Net loss	—	—	—		—	—	—	(3,833)	(3,833)
Balance at December 31, 2013	—	$ —	—	$ —	10,000	$ —	$ —	$ (3,833)	$ (3,833)
Issuance of common stock for services	—	—	—	—	2,100,000	2	250	—	252
Initial issuance of Series A redeemable convertible preferred stock, including exchange of convertible notes payable of $2,929 and net of tranche rights of $2,600 and issuance costs of $22	6,500,000	3,878	—	—	—	—	—	—	—
Subsequent issuance of preferred stock, net of issuance costs of $9	18,500,000	18,491	—	—	—	—	—	—	—
Reclassification of tranche rights upon issuance of redeemable convertible preferred stock	—	(1,756)	—	—	—	—	—	—	—
Vesting of restricted common stock	—	—	—	—	1,353,092	1	8	—	9
Stock-based compensation expense	—	—	—	—	—	—	425	—	425
Accretion of redeemable convertible preferred stock to redemption value	—	1,366	—	—	—	—	(683)	(683)	(1,366)
Net loss	—	—			—	—	—	(16,317)	(16,317)
Balance at December 31, 2014	25,000,000	$ 21,979	—	$ —	3,463,092	$ 3	$ —	$ (20,833)	$ (20,830)
Issuance of Series A redeemable convertible preferred stock, net of issuance costs of $1	20,000,000	19,999	—	—	—	—	—	—	—
Reclassification of tranche rights upon issuance of redeemable convertible preferred stock	—	16,055	—	—	—	—	—	—	—
Issuance of Series B redeemable convertible preferred stock, net of discount of $5,000 and issuance costs of $58	—	—	10,000,000	24,942	—	—	—	—	—
Vesting of restricted common stock	—	—	—	—	1,076,604	2	5	—	7
Stock-based compensation expense	—	—	—	—	—	—	302	—	302
Accretion of redeemable convertible preferred stock to redemption value	—	599	—	400	—	—	(307)	(692)	(999)
Net loss	—	—	—	—	—	—	—	(14,577)	(14,577)
Balance at March 31, 2015, unaudited	45,000,000	$ 58,632	10,000,000	$ 25,342	4,539,696	$ 5	$ —	$ (36,102)	$ (36,097)
Conversion of redeemable convertible preferred stock into common stock (unaudited)	(45,000,000)	(58,632)	(10,000,000)	(25,342)	55,000,000	55	82,544	1,375	83,974
Pro forma balance at March 31, 2015 (unaudited)	—	$ —	—	$ —	59,539,696	$ 60	$ 82,544	$ (34,727)	$ 47,877

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

Voyager Therapeutics, Inc.

Statements of Cash Flows

(amounts in thousands)

	Period from June 19, 2013 (Inception) to December 31, 2013	Year Ended December 31, 2014	Three Months Ended March 31,	
			2014	2015
			(unaudited)	
Cash flow from operating activities				
Net loss	$ (3,833)	$ (16,317)	$ (3,052)	$ (14,577)
Adjustments to reconcile net loss to net cash used in operating activities:				
Stock-based compensation expense	—	425	31	302
Depreciation and amortization	—	184	3	131
Change in fair value of preferred stock tranche liability	—	1,949	65	9,750
Non-cash interest on convertible promissory notes payable	67	2	2	—
Expense related to shares issued in connection with services performed	—	250	250	—
In-kind research and development expenses	—	—	—	1,006
Deferred rent	—	342	14	(67)
Changes in operating assets and liabilities:				
Prepaid expenses and other current assets	—	(1,185)	(247)	494
Other non-current assets	(14)	(7)	4	(51)
Deferred revenue	—	—	—	67,425
Accounts payable	950	604	(10)	25
Accrued expenses	105	537	236	182
Other non-current liabilities	—	186	170	(170)
Lease incentive benefit	—	1,112	—	138
Net cash provided by (used in) operating activities	(2,725)	(11,918)	(2,534)	64,588
Cash flow from investing activities				
Purchases of property and equipment	—	(2,988)	(160)	(150)
Change in restricted cash	—	(314)	(25)	—
Net cash used in investing activities	—	(3,302)	(185)	(150)
Cash flow from financing activities				
Proceeds from convertible promissory notes payable	2,860	—	—	—
Proceeds from the issuance of Series A redeemable convertible preferred stock and tranche rights, net of issuance costs	—	22,040	3,549	19,999
Proceeds from the issuance of Series B redeemable convertible preferred stock net of discount and issuance costs	—	—	—	24,942
Proceeds from the issuance of common stock and restricted stock	—	80	5	—
Net cash provided by financing activities	2,860	22,120	3,554	44,941
Net increase in cash and cash equivalents	135	6,900	835	109,379
Cash and cash equivalents, beginning of period	—	135	135	7,035
Cash and cash equivalents, end of period	$ 135	$ 7,035	$ 970	$ 116,414
Supplemental Disclosure of Cash and non-cash activities				
Accretion of redeemable convertible preferred stock to redemption value	$ —	$ 1,366	$ 159	$ 999
Exchange of promissory notes payable and accrued interest into Series A redeemable convertible preferred stock and tranche rights	$ —	$ 2,929	$ 2,929	$ —

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

1. Nature of business

Voyager Therapeutics, Inc. ("the Company") is a clinical-stage gene therapy company focused on developing life-changing treatments for patients suffering from severe diseases of the central nervous system (the "CNS"). The Company focuses on CNS diseases where we believe that an adeno-associated virus ("AAV") gene therapy approach can have a clinically meaningful impact by either increasing or decreasing the production of a specific protein. The Company has created a product engine that enables us to engineer, optimize, manufacture and deliver our AAV-based gene therapies that have the potential to provide durable efficacy following a single administration directly to the CNS. The Company's product engine has rapidly generated programs for five CNS indications, including advanced Parkinson's disease, a form of monogenic amyotrophic lateral sclerosis, Friedreich's ataxia, Huntington's disease and spinal muscular atrophy. The Company's most advanced clinical candidate, VY-AADC01, is being evaluated for the treatment of advanced Parkinson's disease in an open-label, Phase 1b clinical trial with the goal of generating human proof-of-concept data in 2016.

The Company is subject to risks common to companies in the gene therapy industry, including but not limited to, risks of failure of pre-clinical studies, clinical studies and clinical trials, the need to obtain marketing approval for its drug product candidates, the need to successfully commercialize and gain market acceptance of its drug product candidates and its consumer products, dependence on key personnel, protection of proprietary technology, compliance with government regulations, development by competitors of technological innovations and ability to transition from pilot-scale manufacturing to large-scale production of products.

Liquidity

The Company has generated an accumulated deficit of $36,102,000 at March 31, 2015 (unaudited), and will require substantial additional capital to fund operations. The future success of the Company is dependent on its ability to develop its product candidates, and ultimately upon its ability to attain profitable operations. At March 31, 2015, the Company had $116,414,000 of unrestricted cash and cash equivalents. In April 2015, the Company sold 20,000,001 shares of Series B redeemable convertible preferred stock ("Series B Preferred Stock") with an aggregate purchase price of $60,000,003.

The Company believes the cash and cash equivalents of $116,414,000 at March 31, 2015, together with the proceeds from the Series B Preferred Stock issuance in April 2015 will be sufficient to fund the Company's current operating plan through at least the next 24 months. Thereafter, the Company will be required to obtain additional funding and intends to pursue a public offering of its common stock to fund future operations. However, if the Company is unable to complete a sufficient public offering in a timely manner it would need to pursue other financing alternatives, such as private financing of debt or equity or collaboration agreements. There can be no assurances, however, that the current operating plan will be achieved or that additional funding will be available on terms acceptable to the Company, or at all.

2. Summary of significant accounting policies

The following is a summary of significant accounting policies followed in the preparation of these financial statements.

2. Summary of significant accounting policies (Continued)

Basis of presentation

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

Use of estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. On an ongoing basis, the Company's management evaluates its estimates, which include, but are not limited to, estimates related to revenue recognition, accrued expenses, valuation of the tranche rights, stock-based compensation expense, income taxes and the fair value of common stock. The Company bases its estimates on historical experience and other market specific or other relevant assumptions that it believes to be reasonable under the circumstances. Actual results may differ from those estimates or assumptions.

Unaudited interim financial information

The accompanying balance sheet as of March 31, 2015, the statements of operations and statements of cash flows for the three months ended March 31, 2014 and 2015, and the statement of redeemable convertible preferred stock and stockholders' equity (deficit) for the three months ended March 31, 2015, are unaudited. The interim unaudited financial statements have been prepared on the same basis as the annual audited financial statements; and in the opinion of management, reflect all adjustments, which include only normal recurring adjustments necessary for the fair statement of the Company's financial position as of March 31, 2015, and the results of its operations and comprehensive loss and its cash flows for the three months ended March 31, 2014 and 2015. The financial data and other information disclosed in these notes related to the three months ended March 31, 2014 and 2015 are unaudited. The results for the three months ended March 31, 2015, are not necessarily indicative of results to be expected for the year ending December 31, 2015, any other interim periods, or any future year or period.

Unaudited pro forma information

The accompanying unaudited pro forma balance sheet as of March 31, 2015 has been prepared to give effect to the automatic conversion of all shares of redeemable convertible preferred stock outstanding as of March 31, 2015 into 55,000,000 shares of common stock as if the proposed initial public offering had occurred on March 31, 2015. In the accompanying statements of operations, unaudited pro forma basic and diluted net loss per share attributable to common stockholders has been prepared to give effect to the automatic conversion of all outstanding shares of redeemable convertible preferred stock as if the proposed initial public offering had occurred on the later of at the beginning of the reporting period or the issuance date of the redeemable convertible preferred stock. Accordingly, the unaudited pro forma net loss attributable to common stockholders used in the calculation of unaudited basic and diluted pro forma net loss per share attributable to common stockholders does not

2. Summary of significant accounting policies (Continued)

include the effects of the accretion of issuance costs, discounts and accruing dividends on redeemable convertible preferred stock or the tranche rights mark to market adjustments.

Fair Value of Financial Instruments

ASC Topic 820, *Fair Value Measurement* ("ASC 820"), establishes a fair value hierarchy for instruments measured at fair value that distinguishes between assumptions based on market data (observable inputs) and the Company's own assumptions (unobservable inputs). Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the inputs that market participants would use in pricing the asset or liability, and are developed based on the best information available in the circumstances.

ASC 820 identifies fair value as the exchange price, or exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As a basis for considering market participant assumptions in fair value measurements, ASC 820 establishes a three-tier fair value hierarchy that distinguishes between the following:

- *Level 1*—Quoted market prices in active markets for identical assets or liabilities.
- *Level 2*—Inputs other than Level 1 inputs that are either directly or indirectly observable, such as quoted market prices, interest rates, and yield curves.
- *Level 3*—Unobservable inputs developed using estimates of assumptions developed by the Company, which reflect those that a market participant would use.

To the extent that the valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment. Accordingly, the degree of judgment exercised by the Company in determining fair value is greatest for instruments categorized in Level 3. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement.

The carrying amounts reflected in the balance sheets for cash and cash equivalents, prepaid expenses and other current assets, accounts payable and accrued expenses approximate their fair values, due to their short-term nature.

Cash and cash equivalents

The Company considers all highly liquid investments purchased with original maturities of 90 days or less at acquisition to be cash equivalents. Cash and cash equivalents include cash held in banks and amounts held in money market funds.

Restricted cash

At March 31, 2015 and December 31, 2014, the Company maintained restricted cash totaling approximately $314,000 held in the form of money market accounts as collateral for the Company's facility lease obligation and credit cards. The balance is included within deposits and other non-current assets in the accompanying balance sheets. At December 31, 2013, the Company had no restricted cash.

2. Summary of significant accounting policies (Continued)

Property and equipment

Property and equipment consists of laboratory equipment, furniture and office equipment and leasehold improvements and is stated at cost, less accumulated depreciation. Maintenance and repairs that do not improve or extend the lives of the respective assets are expensed to operations as incurred; while costs of major additions and betterments are capitalized. Depreciation is calculated over the estimated useful lives of the assets using the straight-line method.

Impairment of long-lived assets

The Company evaluates long-lived assets for potential impairment when events or changes in circumstances indicate the carrying value of the assets may not be recoverable. Recoverability is measured by comparing the book values of the assets to the expected future net undiscounted cash flows that the assets are expected to generate. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the book values of the assets exceed their fair value. The Company has not recognized any impairment losses from inception through March 31, 2015.

Revenue Recognition

As of March 31, 2015, all of the Company's revenue is generated exclusively from its collaboration agreement with Genzyme Corporation, a Sanofi company ("Genzyme").

The Company recognizes revenue in accordance with ASC Topic 605, *Revenue Recognition* ("ASC 605"). Accordingly, revenue is recognized for each unit of accounting when all of the following criteria are met:

- Persuasive evidence of an arrangement exists;
- Delivery has occurred or services have been rendered;
- The seller's price to the buyer is fixed or determinable; and
- Collectability is reasonably assured.

Amounts received prior to satisfying the revenue recognition criteria are recorded as deferred revenue in the Company's balance sheet. Amounts expected to be recognized as revenue within 12 months following the balance sheet date are classified as deferred revenue, current portion. Amounts not expected to be recognized as revenue within the 12 months following the balance sheet date are classified as deferred revenue, net of current portion.

The Company analyzes the multiple element arrangements based on the guidance in ASC Topic 605-25, *Revenue Recognition—Multiple Element Arrangements* ("ASC 605-25"). Pursuant to the guidance in ASC 605-25, the Company evaluates multiple element arrangements to determine (1) the deliverables included in the arrangement and (2) whether the individual deliverables represent separate units of accounting or whether they must be accounted for as a combined unit of accounting. This evaluation involves subjective determinations and requires management to make judgements about the individual deliverables and whether such deliverables are separate from other aspects of the contractual relationship. Deliverables are considered separate units of accounting provided that: (i) the delivered item(s) has value to the customer on a standalone basis and (ii) if the arrangement includes a general

2. Summary of significant accounting policies (Continued)

right of return relative to the delivered item(s), delivery or performance of the undelivered item(s) is considered probable and substantially within control of the Company. In assessing whether an item has standalone value, the Company considers factors such as the research, manufacturing and commercialization capabilities of the collaboration partner and the availability of the associated expertise in the general marketplace. In addition, the Company considers whether the collaboration partner can use the other deliverable(s) for their intended purpose without the receipt of the remaining element(s), whether the value of the deliverable is dependent on the undelivered item(s) and whether there are other vendors that can provide the undelivered element(s). The Company's collaboration agreement does not contain a general right of return relative to any delivered items.

Arrangement consideration that is fixed or determinable is allocated among the separate units of accounting using the relative selling price method. Then the applicable revenue recognition criteria in ASC 605 are applied to each of the separate units of accounting in determining the appropriate period and pattern of recognition. The Company determines the selling price of a unit of accounting following the hierarchy of evidence prescribed by ASC 605-25. Accordingly, the Company determines the estimated selling price for units of accounting within each arrangement using vendor specific objective evidence ("VSOE") of selling price, if available, third party evidence ("TPE") of selling price if VSOE is not available, or best estimate of selling price ("BESP") if neither VSOE or TPE is available. The Company has only used BESP to estimate the selling price, since it has not had VSOE or TPE of selling price of any units of accounting to date. Determining BESP for a unit of accounting requires significant judgement. In developing the BESP for a unit of accounting, the Company considers applicable market conditions and relevant entity specific factors, including factors that were contemplated in negotiating the agreement with the customer and estimated costs. The Company validates BESP for units of accounting by evaluating whether changes in the key assumptions used to determine the BESP will have a significant effect on the allocation of arrangement consideration between multiple units of accounting.

Options are considered substantive if, at the inception of the arrangement, the Company is at risk as to whether the collaboration partner will choose to exercise the option. Factors that the Company considers in evaluating whether an option is substantive include the cost to exercise the option, the overall objective of the arrangement, the benefit the collaborator might obtain from the arrangement without exercising the option and the likelihood the option will be exercised. When an option is considered substantive, the Company does not consider the option or item underlying the option to be a deliverable at the inception of the arrangement and the associated option fees are not included in allocable consideration, assuming the option is not priced at a significant and incremental discount. Conversely, when an option is not considered substantive, the Company would consider the option, including other deliverables contingent upon the exercise of the option, to be a deliverable at the inception of the arrangement and a corresponding amount would be included in allocable arrangement consideration. In addition, if the price of the option includes a significant incremental discount, the option would be included as a deliverable at the inception of the arrangement.

The Company recognizes arrangement consideration allocated to each unit of accounting when all of the revenue recognition criteria in ASC 605 are satisfied for that particular unit of accounting. The Company will recognize revenue associated with license options upon exercise of the option, if the underlying license has standalone value from the other deliverables to be provided subsequent to delivery of the license. If the license does not have standalone value, the amounts allocated to the license option will be combined with the related undelivered items as a single unit of accounting. The

2. Summary of significant accounting policies (Continued)

amounts allocated to the license option in the Genzyme agreement will be deferred until the option is exercised. The revenue recognition upon option exercise will be determined based on whether the license has standalone value from the remaining deliverables under the arrangement at the time of exercise.

The Company recognizes the amounts associated with research and development services, alliance joint steering committees and development advisory committees ratably over the associated period of performance. If there is no discernible pattern of performance and/or objectively measurable performance measures do not exist, then the Company recognizes revenue under the arrangement on a straight-line basis over the period the Company is expected to complete its performance obligations. Conversely, if the pattern of performance in which the service is provided to the customer can be determined and objectively measureable performance exist, then the Company recognizes revenue under the arrangement using the proportional performance method. Revenue recognized is limited to the lesser of the cumulative amount of payments received of the cumulative revenue earned determined using the straight line method or proportional performance, as applicable, as of the period end date.

At the inception of an arrangement that includes milestone payments, the Company evaluates whether each milestone is substantive and at risk to both parties on the basis of the contingent nature of the milestone. This evaluation includes an assessment of whether: (i) the consideration is commensurate with either the Company's performance to achieve the milestone or the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from the Company's performance to achieve the milestone, (ii) the consideration relates solely to past performance and (iii) the consideration is reasonable relative to all of the deliverables and payment terms within the arrangement. The Company evaluates factors such as clinical, regulatory, commercial and other risks that must be overcome to achieve the respective milestone and the level of effort and investment required to achieve the respective milestone in making this assessment. There is considerable judgement involved in determining whether a milestone satisfies all of the criteria required to conclude that a milestone is substantive. In accordance with ASC Topic 605-28, *Revenue Recognition—Milestone Method* ("ASC 605-28") clinical and regulatory milestones that are considered substantive, will be recognized as revenue in its entirety upon successful accomplishment of the milestone, assuming all other revenue recognition criteria are met. Milestones that are not considered substantive would be recognized as revenue over the remaining period of performance, assuming all other revenue recognition criteria are met. Revenue from commercial milestone payments will be accounted for as royalties and recorded as revenue upon achievement of the milestone, assuming all other revenue recognition criteria are met.

The Company will recognize royalty revenue in the period of sale of the related product(s), based on the underlying contract terms, provided that the reported sales are reliably measurable and the Company has no remaining performance obligations, assuming all other revenue recognition criteria are met.

The Company also considered the impact of potential future payments it makes in its role as a vendor to its customers or collaboration partners and evaluate if these potential future payments could be reductions of revenue from that customer. If the potential future payments to the customer are (i) a separately identifiable benefit and (ii) the fair value of the identifiable benefit can be reasonably estimated, then the payments are accounted for separately from the revenue received from the

2. Summary of significant accounting policies (Continued)

customer. If however, both of these criteria are not satisfied, then the payments are treated as a reduction of revenue.

Research and development

Research and development costs are charged to expense as incurred in performing research and development activities. The costs include employee compensation costs, external research, consultant costs, sponsored research, license fees, process development and facilities costs. Facilities costs primarily include the allocation of rent, utilities and depreciation.

Research contract costs and accruals

The Company has entered into various research and development contracts with research institutions and other companies in the United States. These agreements are generally cancelable. The Company records accruals for estimated ongoing research costs. When evaluating the adequacy of the accrued liabilities, the Company analyzes progress of the studies, including the phase or completion of events, invoices received and contracted costs. Significant judgments and estimates may be made in determining the accrued balances at the end of any reporting period. Actual results could differ from the Company's estimates. The Company's historical accrual estimates have not been materially different from the actual costs.

Patent costs

The Company expenses patent application and related legal costs as incurred and classifies such costs as general and administrative expenses in the accompanying statements of operations.

Stock-based compensation expense

The Company accounts for its stock-based compensation awards in accordance with ASC Topic 718 *Compensation—Stock Compensation* ("ASC 718"). ASC 718 requires all stock-based payments to employees, including grants of restricted stock, to be recognized as expense in the statements of operations based on their grant date fair values. The Company initially values restricted stock awards granted to non-employees at their grant date fair values and subsequently revalues these awards based on changes in the fair value of the Company's stock.

The Company expenses the fair value of its restricted stock awards to employees on a straight-line basis over the associated service period, which is generally the period in which the related services are received. Awards of restricted stock to non-employees are adjusted through stock-based compensation expense at each reporting period end to reflect the current fair value of such awards and expensed on a straight-line basis.

The Company records the expense for restricted stock award grants subject to performance-based milestone vesting over the remaining service period when management determines that achievement of the milestone is probable. Management evaluates when the achievement of a performance-based milestone is probable based on the expected satisfaction of the performance conditions as of the reporting date.

2. Summary of significant accounting policies (Continued)

Income taxes

Income taxes are recorded in accordance with ASC Topic 740, *Income Taxes* ("ASC 740"), which provides for deferred taxes using an asset and liability approach. Under this method, deferred tax assets and liabilities are determined based on the difference between the financial reporting and the tax reporting basis of assets and liabilities and are measured using the enacted tax rates and laws that are expected to be in effect when the differences are expected to reverse. The Company provides a valuation allowance against net deferred tax assets unless, based upon the weight of available evidence, it is more likely than not that the deferred tax assets will be realized.

The Company accounts for uncertain tax positions in accordance with the provisions of ASC 740. When uncertain tax positions exist, the Company recognized the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position as well as consideration of the available facts and circumstances. As of December 31, 2013 and December 31, 2014, the Company does not have any significant uncertain tax positions.

Comprehensive loss

The Company's net loss equals comprehensive loss for the periods presented.

Net loss per share

Basic net loss per common share is calculated by dividing the net loss attributable to common stockholders by the weighted-average number of common shares outstanding during the period, without consideration for potentially dilutive securities. Diluted net loss per share is computed by dividing the net loss attributable to common stockholders by the weighted-average number of common shares and potentially dilutive securities outstanding for the period determined using the treasury-stock and if-converted methods.

For purposes of the diluted net loss per share calculation, convertible preferred stock and unvested restricted common stock are considered to be potentially dilutive securities, but are excluded from the calculation of diluted net loss per share because their effect would be anti-dilutive and therefore, basic and diluted net loss per share were the same for all periods presented.

The following table sets forth the outstanding potentially dilutive securities that have been excluded in the calculation of diluted net loss per share because to do so would be anti-dilutive (in common stock equivalent shares):

	As of December 31,		As of March 31,	
	2013	2014	2014	2015
			(unaudited)	
Series A redeemable convertible preferred stock	—	25,000,000	6,500,000	45,000,000
Series B redeemable convertible preferred stock	—	—	—	10,000,000
Unvested restricted common stock	—	10,960,020	5,000,000	9,883,416
Total	—	35,960,020	11,500,000	64,883,416

2. Summary of significant accounting policies (Continued)

In addition to the potentially dilutive securities noted above, as of December 31, 2013, the Company had $2,927,000 of outstanding convertible notes payable that were contingently convertible into redeemable convertible preferred stock, at the option of the holder, upon the occurrence of future financing events at prices that were not determinable until the occurrence of those future events. In January 2014, in connection with the initial issuance of preferred stock, the Company exchanged these notes and additional interest accrued during 2014 into 2,928,827 shares of Series A redeemable convertible preferred stock ("Series A Preferred Stock").

The Company's redeemable convertible preferred stock is entitled to receive dividends based on dividends declared to common stockholders, thereby giving the preferred stockholders the right to participate in undistributed earnings of the Company above the stated dividend rate. However, preferred stockholders do not have a contractual obligation to share in the losses of the Company. As of December 31, 2014 and all prior periods reported, the Company has been in a net loss position; therefore, the Company's accounting for basic and diluted earnings per share was unaffected by the participation rights of the preferred stockholders.

Pro forma net loss per share

The unaudited pro forma net loss attributable to common stockholders used in the calculation of unaudited basic and diluted pro forma net loss per share attributable to common stockholders does not include the effects of the accretion of issuance costs, discounts, and accruing dividends on redeemable convertible preferred stock because it assumes that the conversion of redeemable convertible preferred stock into common stock occurred on the later of January 1, 2014 or the issuance date of the redeemable convertible preferred stock for the year ended December 31, 2014, and on the later of January 1, 2015 or the issuance date of the redeemable convertible preferred stock for the three months ended March 31, 2015.

The following table summarizes our unaudited pro forma net loss per share attributable to common stockholders (in thousands, except share and per share data):

	Year Ended December 31, 2014	Three Months Ended March 31, 2015 (unaudited)
Net loss attributable to common stockholders	$ (17,683)	$ (15,813)
Add:		
Changes in fair value of preferred stock tranche liability	1,949	9,750
Accretion of preferred stock to redemption value	1,366	999
Accrued dividends on Series A Preferred Stock	—	237
Pro forma net loss	$ (14,368)	$ (4,827)
Weighted average number of common shares outstanding, basic and diluted	2,700,696	4,255,824
Add:		
Pro forma adjustments to reflect assumed conversion of preferred stock	13,597,260	42,444,444
Shares used to compute pro forma net loss per share, basic and diluted	16,297,956	46,700,268
Pro forma basic and diluted net loss per share attributable to common stockholders	$ (0.88)	$ (0.10)

2. Summary of significant accounting policies (Continued)

Concentrations of credit risk and off-balance sheet risk

The Company has no financial instruments with off-balance sheet risk such as foreign exchange contracts, option contracts or other foreign hedging arrangements. Financial instruments that potentially subject the Company to a concentration of credit risk are cash and cash equivalents. The Company's cash is held in accounts at a financial institution that may exceed federally insured limits. The Company has not experienced any credit losses in such accounts and does not believe it is exposed to any significant credit risk on these funds.

Concentration of suppliers

The Company is dependent on a third-party manufacturer to supply certain products for research and development activities in its programs. In particular, the Company relies and expects to continue to rely on a sole manufacturer to supply it with specific vectors related to the Company's research and development programs.

Segment information

Operating segments are defined as components of an enterprise about which separate discrete information is available for evaluation by the chief operating decision maker in deciding how to allocate resources and assess performance. The Company and the Company's chief operating decision maker, the Company's Chief Executive Officer, views the Company's operations and manages its business as a single operating segment, which is the business of developing and commercializing gene therapies.

Recent accounting pronouncements

In May 2014, the FASB issued ASU No. 2014-09, *Revenue From Contracts With Customers*. ASU 2014-09 amends Accounting Standards Codification ASC 605, *Revenue Recognition*, by outlining a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers. ASU 2014-09 will be effective for the Company for interim and annual periods beginning after December 15, 2017. The Company is evaluating the impact that this ASU may have on its financial statements, if any.

In June 2014, the FASB issued ASU No. 2014-10, which eliminates the concept of a development stage entity, or DSE, in its entirety from GAAP. Under existing guidance, DSEs are required to report incremental information, including inception-to-date financial information, in their financial statements. A DSE is an entity devoting substantially all of its efforts to establishing a new business and for which either planned principal operations have not yet commenced or have commenced but there has been no significant revenues generated from that business. Entities classified as DSEs will no longer be subject to these incremental reporting requirement. ASU No. 2014-10 is effective for fiscal years beginning after December 15, 2014, with early adoption permitted. Prior to the issuance of ASU No. 2014-10, the Company had met the definition of a DSE since its inception. The Company elected to early adopt the provisions of ASU 2014-10 in these financial statements.

In August 2014, the FASB issued ASU No. 2014-15, which requires management to assess an entity's ability to continue as a going concern every reporting period, and provide certain disclosures if management has substantial doubt about the entity's ability to operate as a going concern, or an

2. Summary of significant accounting policies (Continued)

express statement if not, by incorporating and expanding upon certain principles that are currently in U.S. auditing standards. This guidance is effective for the annual period ending after December 15, 2016, and for annual periods and interim periods thereafter. Early application is permitted. The Company is in process of evaluating this guidance and determining the expected effect on its financial statements.

3. Fair Value Measurements

Assets and liabilities measured at fair value on a recurring basis as of December 31, 2014 are as follows (in thousands):

Liabilities	December 31, 2014	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Convertible preferred stock tranche liability	$ 6,305	$ —	$ —	$ 6,305
Total	$ 6,305	$ —	$ —	$ 6,305

The Company estimates the fair value of the Series A Preferred Stock tranche liability at the time of issuance and subsequently remeasures it using a probability-weighted present value model that considers the probability of closing a tranche (67%), the estimated future value of Series A Preferred Stock at closing ($1.51), and the investment required ($20.0 million) at closing. Future values are converted to present value using a discount rate (16.2%) appropriate for probability-adjusted cash flows. The estimates are based, in part, on subjective assumptions. Changes to these assumptions as well as the Company's stock value on the reporting date can have a significant impact on the fair value of the convertible preferred stock tranche liability.

The following table provides a reconciliation of all assets and liabilities measured at fair value using Level 3 significant unobservable inputs (in thousands):

	Preferred Stock Tranche Asset	Preferred Stock Tranche Liability
Balance at December 31, 2013	$ —	$ —
Issuance	1,495	4,095
Changes in fair value	261	2,210
Reclassification to Series A Preferred Stock	(1,756)	—
Balance at December 31, 2014	$ —	$ 6,305
Changes in fair value	—	9,750
Reclassification to Series A Preferred Stock	—	(16,055)
Balance at March 31, 2015 (unaudited)	$ —	$ —

Assets and liabilities measured at fair value on a recurring basis as of March 31, 2015 are as follows (in thousands):

Assets	March 31, 2015 (unaudited)	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Money market funds, included in cash equivalents	$ 115,000	$ 115,000	$ —	$ —
Total	$ 115,000	$ 115,000	$ —	$ —

4. Prepaid expenses and other current assets

Prepaid expense and other current assets consist of the following (in thousands):

	As of December 31,		As of March 31, 2015
	2013	2014	(unaudited)
Prepaid expenses	$ —	$ 900	$ 462
Other current assets	—	423	229
Total	$ —	$ 1,323	$ 691

5. Property and equipment, net

Property and equipment, net consists of the following (in thousands):

	As of December 31,		As of March 31, 2015
	2013	2014	(unaudited)
Laboratory equipment	$ —	$ 1,223	$ 1,391
Furniture and office equipment	—	441	441
Leasehold improvements	—	1,324	1,324
	—	2,988	3,156
Less: accumulated depreciation	—	(184)	(315)
Property and equipment, net	$ —	$ 2,804	$ 2,841

The Company recorded $0 and $184,000 in depreciation expense during the period and year ended December 31, 2013 and 2014, respectively, and $3,000 and $131,000 in depreciation expense during the three months ended March 31, 2014 and March 31, 2015, respectively.

6. Accrued expenses

Accrued expenses consist of the following (in thousands):

	As of December 31,		As of March 31, 2015
	2013	2014	(unaudited)
Patent costs	$ 15	$ 274	$ 207
Research and development costs	—	125	385
Professional services	90	81	146
Employee compensation costs	—	85	64
Other	—	77	22
Total	$ 105	$ 642	$ 824

7. Convertible Promissory Notes Payable

In June and November 2013, the Company issued convertible promissory notes (the "Convertible Notes") to an investor in the aggregate amount of $1,860,000 and $1,000,000, respectively. The Convertible Notes accrued interest simple at a rate of 6% per annum. The notes along with accrued interest were due and payable upon the earlier of an equity financing with cash proceeds in excess of $1,000,000 or at the election of the holder any time after December 31, 2014.

Upon the closing of the sale of the Company's Series A Preferred Stock on January 9, 2014, the unpaid principal and accrued interest on the Convertible Notes of $2,929,000 was exchanged into shares of Series A Preferred Stock at $1.00 per share which is the price paid by the investors in Series A Preferred Stock. The Company recorded approximately $67,000, $2,000 and $2,000 of interest expense related to the Convertible Notes for the period and year ended December 31, 2013 and 2014 and the three months ended March 31, 2014, respectively.

8. Commitments and contingencies

Operating leases

During March 2014, the Company entered into an agreement to lease its facility under a non-cancelable operating lease that expires December 15, 2019. The lease includes two renewal options, each for five year terms and at fair market value upon exercise. The lease contains escalating rent clauses which require higher rent payments in future years. The Company expenses rent on a straight-line basis over the term of the lease, including any rent-free periods.

The Company received a leasehold improvement incentive from the landlord totaling $1,250,000. The Company recorded these incentives as a component of deferred rent and will amortize these incentives as a reduction of rent expense over the life of the lease. These leasehold improvements have been recorded as fixed assets.

Rent expense of approximately $48,000 and $686,000 was incurred during the period and year ended December 31, 2013 and 2014, respectively, and $60,000 and $232,000 was incurred during the three months ended March 31, 2014 and March 31, 2015, respectively.

Future annual minimum lease payments at December 31, 2014 are as follows (in thousands):

	Total Minimum Lease Payments
2015	$ 1,117
2016	1,170
2017	1,192
2018	1,214
2019	1,184
	$ 5,877

8. Commitments and contingencies (Continued)

Significant Agreements

Genzyme Collaboration Agreement

Summary of Agreement

In February 2015, the Company entered into an agreement with Genzyme ("Collaboration Agreement"), which included a non-refundable upfront payment of $65.0 million. In addition, contemporaneous with entering into the Collaboration Agreement, Genzyme entered into a Series B Stock Purchase Agreement, under which Genzyme purchased 10,000,000 shares of Series B Preferred Stock for $30.0 million. The fair value of the Series B Preferred Stock at the time of issuance was approximately $25.0 million. The $5.0 million premium over the fair value is accounted for as additional consideration under the Collaboration Agreement.

Under the Collaboration Agreement, the Company granted Genzyme an exclusive option to license, develop and commercialize (i) ex-U.S. rights to the following programs, which are referred to as Split Territory Programs; VY-AADC01 ("Parkinson's Program"), VY-FXN01 ("Friedreich's Ataxia Program"), a future program to be designated by Genzyme ("Future Program") and VY-HTT01 ("Huntington's Program") with an incremental option to co-commercialize VY-HTT01 in the United States and (ii) worldwide rights to VY-SMN101 ("Spinal Muscular Atrophy Program"). Genzyme's option for the Split Territory Programs and the Spinal Muscular Atrophy Program is triggered following the completion of the first proof-of-principle human clinical study ("POP Study"), on a program by program basis.

Prior to any option exercise by Genzyme, the Company will collaborate with Genzyme in the development of products under each Split Territory Program and VY-SMN101 pursuant to a written development plan and under the guidance of an Alliance Joint Steering Committee ("AJSC"), comprised of an equal number of employees from the Company and Genzyme.

The Company is required to use commercially reasonable efforts to develop products under each Split Territory Program and the Spinal Muscular Atrophy Program through the completion of the applicable POP Study. During the development of these joint programs, the activities are guided by a Development Advisory Committee ("DAC"). The DAC may elect to utilize certain Genzyme technology relating to the VY-AADC01 Program, the VY-HTT01 Program or generally with the manufacture of Split Territory Program products.

The Company is solely responsible for all costs incurred in connection with the development of the Split Territory Programs and the Spinal Muscular Atrophy Program products prior to the exercise of an option by Genzyme with the exception of the following: (i) at the Company's request and upon mutual agreement, Genzyme will provide "in-kind" services valued at up to $5.0 million and (ii) Genzyme shall be responsible for the costs and expenses of activities under the Huntington's Program development plan to the extent such activities are covered by financial support Genzyme is entitled to receive from a patient advocacy group, collectively Genzyme "in-kind" and other funding.

Other than the Parkinson's Program (for which a POP Study has already been commenced), if the Company does not initiate a POP Study for a given Split Territory Program by December 31, 2026 (or for the Future Program by the tenth anniversary of the date the Future Program is nominated by Genzyme), and Genzyme has not terminated the Collaboration Agreement with respect to the collaboration program, then Genzyme shall be entitled, as its sole and exclusive remedy, to a credit of

8. Commitments and contingencies (Continued)

$10.0 million for each such program against other milestone or royalty payments payable by Genzyme under the Collaboration Agreement. However, if the POP Study is not initiated due to a regulatory delay or a force majeure event, such time period shall be extended for so long as such delay continues.

With the exception of the Parkinson's Program, Genzyme is required to pay an option exercise payment of $20.0 million or $30.0 million for each Split Territory Program, as well as the Spinal Muscular Atrophy Program.

Upon Genzyme's exercise of its option to license a given product in a Split Territory Program ("Split Territory Licensed Product"), the Company will have sole responsibility for the development of such Split Territory Licensed Product in the United States and Genzyme shall have sole responsibility for development of such Split Territory Licensed Product in the rest of the world. The Company and Genzyme will have shared responsibility for execution of ongoing development of such Split Territory Licensed Product that is not specific to either territory, including costs associated therewith. The Company is responsible for all commercialization activities relating to Split Territory Licensed Products in the United States, including all of the associated costs. Genzyme is responsible for all commercialization activities relating to the Split Territory Licensed Products in the rest of the world, including all of the associated costs. If Genzyme exercised its co-commercialization rights, Genzyme will be the lead party responsible for all commercialization activities related to Huntington's Licensed Product in the United States.

Upon exercise of the option, Genzyme shall have the sole right to develop the Spinal Muscular Atrophy Product worldwide. Genzyme shall be responsible for all of the development costs that occur after the option exercise date for the Spinal Muscular Atrophy Program. Genzyme is also responsible for commercialization activities relating to the Spinal Muscular Atrophy Product worldwide.

Genzyme is required to pay the Company for specified regulatory and commercial milestones, if achieved, up to $645 million across all programs. The regulatory approval milestones are payable upon either regulatory approval in the United States or regulatory and reimbursement approval in the European Union and range from $40.0 million to $50.0 million per milestone, with an aggregate total of $265 million. The commercial milestones are payable upon achievement of specified annual net sales in each program and range from $50.0 million to $100 million per milestone, with an aggregate total of $380 million.

In addition, to the extent any Split Territory Licensed Products or the Spinal Muscular Atrophy Licensed Product are commercialized, the Company is entitled to tiered royalty payments ranging from the mid-single digits to mid-teens based on a percentage of net sales by Genzyme. Genzyme is entitled to receive tiered royalty payments related to sales of Split Territory Licensed Product ranging from the low-single digits to mid-single digits based on a percentage of net sales by the Company depending on whether the Company uses Genzyme technology in the Split Territory Licensed Product. If Genzyme elects to co-commercialize VY-HTT01 in the United States, the Company and Genzyme will share in any profits or losses from VY-HTT01 product sales.

The Collaboration Agreement will continue in effect until the later of (i) the expiration of the last to expire of the option rights and (ii) the expiration of all payment obligations unless sooner terminated by the Company or Genzyme. The Company and Genzyme have customary termination rights including the right to terminate for an uncured material breach of the agreement committed by the other party and Genzyme has the right to terminate for convenience.

8. Commitments and contingencies (Continued)

Accounting Analysis

The Collaboration Agreement includes the following deliverables: (i) research and development services for each of the Split Territory License Programs and the Spinal Muscular Atrophy Program, (ii) participation in the AJSC, (iii) participation in the DAC and (iv) the option to obtain a development and commercial license in the Parkinson's Program and related deliverables. The Company has determined that the option to obtain a development and commercial license in the Parkinson's program is not a substantive option for accounting purposes, primarily because there is no additional option exercise payment payable by Genzyme at the time the option is exercised. Therefore, the option to obtain a license and other obligations of the Company that are contingent upon exercise of the option are considered deliverables at the inception of the arrangement. The options in the other Split Territory Programs and the Spinal Muscular Atrophy Program are considered substantive as there is substantial option exercise payments payable by Genzyme upon exercise. In addition, as a result of the uncertainties related to the discovery, research, development and commercialization activities, the Company is at risk with regard to whether Genzyme will exercise the options. Moreover, the substantive options are not priced at a significant incremental discount. Accordingly, the substantive options are not considered deliverables at the inception of the arrangement and the associated option exercise payments are not included in allocable arrangement consideration. The Company has also determined that any obligations which are contingent upon the exercise of a substantive option are not considered deliverables at the outset of the arrangement, as these deliverables are contingent upon the exercise of the options. In addition, any option exercise payments associated with the substantive options are not included in the allocable arrangement consideration.

The Company has concluded that each of the deliverables identified at the inception of the arrangement has standalone value from the other undelivered elements. Additionally, the Collaboration Agreement does not include return rights related to the initial collaboration term. Accordingly, each deliverable qualifies as a separate unit of accounting.

The Company has identified $79.3 million of allocable arrangement consideration consisting of the $65 million upfront fee, the $5.0 million premium paid in excess of fair value of the Series B Preferred Stock and $9.3 million of Genzyme "in-kind" and other funding.

The Company has allocated the allocable arrangement consideration based on the relative selling price of each unit of accounting. For all units of accounting, the Company determined the selling price using the best estimate of selling price ("BESP"). The Company determined the BESP for the service related deliverable for the research and development activities based on internal estimates of the costs to perform the services, including expected internal expenses and expenses with third parties for services and supplies, marked up to include a reasonable profit margin and adjusted for the scope of the potential license. Significant inputs used to determine the total expense of the research and development activities include, the length of time required and the number and costs of various studies that will be performed to complete the POP Study. The BESP for the AJSC and DAC have been estimated based on the costs incurred to participate in the committees, marked up to include a reasonable profit margin. The BESP for the license option was determined based on the estimated value of the license and related deliverables adjusted for the estimated probability that the option would be exercised by Genzyme.

8. Commitments and contingencies (Continued)

Based on the relative selling price allocation, the allocable arrangement consideration was allocated as follows:

Unit of Accounting	Amount (in thousands)
Research and Development Services for:	
Huntington's Program	$ 15,662
Parkinson's Program	6,648
Friedreich's Ataxia Program	16,315
Spinal Muscular Atrophy Program	32,050
Future Program	2,464
Committee Obligations:	
AJSC	147
DAC	227
License Option and related deliverables	5,743
Total	$ 79,256

The Company recognizes the amounts associated with research and development services on a straight line basis over the period of service as there is no discernable pattern or objective measure of performance for the services. Similarly, the Company recognizes the amount associated with the committee obligations on a straight line basis over the period of service consistent with the expected pattern of performance. The amounts allocated to the license option will be deferred until the option is exercised. The revenue recognition upon option exercise will be determined based on whether the license has standalone value from the remaining deliverables at the time of exercise.

The Company has evaluated all of the milestones that may be received in connection with the Split Territory Licensed Product and the Spinal Muscular Atrophy Program Licensed Product. In evaluating if a milestone is substantive, the Company assesses whether: (i) the consideration is commensurate with either the Company's performance to achieve the milestone or the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from the Company performance to achieve the milestone, (ii) the consideration relates solely to past performance and (iii) the consideration is reasonable relative to all of the deliverables and payment terms within the arrangement. All regulatory milestones are considered substantive on the basis of the contingent nature of the milestone, specifically reviewing factors such as the scientific, clinical, regulatory, and other risks that must be overcome to achieve the milestone as well as the level of effort and investment required. Accordingly, such amounts will be recognized as revenue in full in the period in which the associated milestone is achieved, assuming all other revenue recognition criteria are met. All commercial milestones will be accounted for in the same manner as royalties and recorded as revenue upon achievement of the milestone, assuming all other revenue recognition criteria are met.

During the three month period ended March 31, 2015, the Company recognized $2,576,000 of revenue associated with its collaboration with Genzyme related to research and development services performed during the period. As of March 31, 2015, there is $68,431,000 of deferred revenue related to the agreement, which is classified as either current or long-term in the accompanying balance sheet based on the period the items will be delivered.

8. Commitments and contingencies (Continued)

Costs incurred relating to the programs that Genzyme has the option to license under the Collaboration Agreement consist of internal and external research and development costs, which primarily include: salaries and benefits, lab supplies and preclinical research studies. The Company does not separately track or segregate the amount of costs incurred under the Collaboration Agreement. All of these costs are included in research and development expenses in the Company's statement of operations during the quarter ended March 31, 2015.

University of Massachusetts ("UMass") and MassBiologics Collaboration

In January 2014, UMass and the Company entered into a Collaboration Agreement wherein the Company granted UMass 100,000 shares of common stock, valued at $12,000, which was recorded as research and development expense. This was the only payment made under the Collaboration Agreement until it was amended by the Collaboration Agreement entered into with UMass and MassBiologics in October 2014.

On October 20, 2014, the Company entered into a Collaboration Agreement with UMass and MassBiologics (of the UMass Medical School).

Under the agreement, the Company shall (i) fund certain projects that will be conducted by UMass or MassBiologics, (ii) fund certain educational programs of UMass, including post-doctoral research at the Company's laboratories beginning in 2015, and (iii) collaborate with MassBiologics to establish scalable processes for manufacturing recombinant adeno-associated viral ("rAAV") vector products using current good manufacturing practices.

In November 2014, the parties agreed to the first project under this agreement whereby the Company will fund approximately $2,861,000 over a sixteen month period for certain research and development services performed by MassBiologics. The project commenced in January 2015. If the agreement is terminated for any reason, the Company is obligated to fund the remaining balance of the total price of all work completed and any other out of pocket costs incurred by MassBiologics on behalf of the Company. As of December 31, 2014 and March 31, 2015, the Company had provided cumulative funding of approximately $376,000 and $474,000, respectively, which exceeded costs incurred by $376,000 and $50,000, respectively. The amount funded in excess of costs incurred is recorded in prepaid expenses as of the balance sheet. Research and development costs incurred by MassBiologics under the project agreement will be expensed by the Company as incurred.

Other Agreements

During 2014 and 2015, the Company entered into various agreements with contract research organizations and institutions to license intellectual property. In consideration for the licensed rights the Company generally made upfront payments, which were recorded as research and development expense as the acquired technologies were considered in-process research and development. During the year ended December 31, 2014 and three months ended March 31, 2014 and 2015, the Company paid $830,000, $300,000 and $75,000, respectively, in up-front license fees. The license agreements also obligate the Company to make additional payments that are contingent upon specific clinical trial and regulatory approval milestones being achieved as well as royalties on future product sales. The agreements to license intellectual property include potential milestone payments that are dependent upon the development of products licensed under the agreements and contingent upon the achievement of clinical trial or regulatory approval milestones. The maximum aggregate potential milestone

8. Commitments and contingencies (Continued)

payments payable by the Company total approximately $12.0 million. Additionally, under the terms of one agreement, the Company has options to license intellectual property to be used in the development of therapies for four additional disease indications. If the Company exercises all of the options under the agreement, it would be obligated to pay aggregate up-front fees of up to approximately $1.5 million and milestone payments that are contingent upon clinical trial results and regulatory approval of $5.0 million per disease indication, or up to $20.0 million in total. As of December 31, 2014 and March 31, 2015, there have been no milestones achieved. The Company can generally terminate the license agreements upon 30-90 days prior written notice.

Additionally, certain license agreements require the Company to reimburse the licensor for certain past and ongoing patent related expenses. During the year ended December 31, 2014 and the three months ended March 31, 2014 and March 31, 2015, the Company incurred $839,000, $702,000 and $38,000 of expense, respectively, related to these reimbursable patent costs which are recorded as general and administrative expense.

Litigation

The Company is not a party to any litigation and does not have contingency reserves established for any litigation liabilities as of December 31, 2013, December 31, 2014 or March 31, 2015.

9. Redeemable Convertible Preferred Stock

The Company's redeemable convertible preferred stock ("Preferred Stock") has been classified as temporary equity on the accompanying balance sheets instead of in stockholders' (deficit) equity in accordance with authoritative guidance for the classification and measurement of redeemable securities as the convertible preferred stock is redeemable at the option of the holder after the redemption date, February 2021.

Series A Preferred Stock

At March 31, 2015, 45,000,000 shares of Series A Preferred Stock were authorized, issued and outstanding. These shares were issued at various closings in 2014 and 2015 for $1.00 per share. The shares were issued in exchange for cash proceeds of $42,039,000, net of issuance costs of $32,000, and the exchange of outstanding Convertible Notes, including accrued interest, of approximately $2,929,000. The Series A Preferred Stock have a liquidation preference amount of $46,816,000 at March 31, 2015.

Tranche Rights Issued with Series A Preferred Stock

Included in the terms of the January 2014 Series A Preferred Stock Purchase Agreement were certain rights ("Tranche Rights") granted to the investors of Series A Preferred Stock purchased in January 2014, including the holders of the Convertible Notes who exchanged the Convertible Notes. The Tranche Rights obligated the investors in Series A Preferred Stock to purchase and the Company to sell an additional 18,500,000 shares of Series A Preferred Stock at $1.00 per share contingent upon successful near term in-licensing and progress on initial experiments and research and development planning ("Tranche Right I"). In addition, the investors are obligated to purchase and the Company is obligated to sell an additional 20,000,000 shares of Series A Preferred Stock upon the development of project engine and achievement of certain clinical milestones ("Tranche Right II"). In addition, the

9. Redeemable Convertible Preferred Stock (Continued)

Tranche Rights allowed the investors the ability to purchase the additional shares at their option at any time. The Tranche Rights were transferrable by the investors, subject to approval by the Board.

The Company has concluded the Tranche Rights meet the definition of a freestanding financial instrument, as the Tranche Rights are legally detachable and separately exercisable from the Series A Preferred Stock. Therefore, the Company has allocated the proceeds between the Tranche Rights and the Series A Preferred Stock. As the Series A Preferred Stock is redeemable at the holder's option, the Tranche Rights are classified as an asset or liability and are initially recorded at fair value. The Tranche Rights are measured at fair value at each reporting period. Since the Tranche Rights are subject to fair value accounting, the Company allocated the proceeds to the Tranche Rights based on the fair value at the date of issuance with the remaining proceeds being allocated to the Series A Preferred Stock. The estimated fair value of the Tranche Rights was determined using a probability-weighted present value model that considers the probability of closing a tranche, the estimated future value of Series A Preferred Stock each closing, and the investment required at each closing. Future values are converted to present value using a discount rate appropriate for probability-adjusted cash flows.

The following table summarizes the initial value of the Tranche Rights included in the Series A Preferred Stock Purchase Agreement (in thousands):

	Fair Value of Tranche Right Asset (Liability)
Tranche Right I	$ 1,495
Tranche Right II	(4,095)
Total value of Tranche Rights	$ (2,600)

Tranche Right I was initially recorded as an asset of $1,495,000 as the purchase price of the additional shares was greater than the estimated value of the Series A Preferred Stock at the expected settlement date. The Company issued 18,500,000 additional shares under Tranche Right I, in three separate closings during the year ended December 31, 2014 with total proceeds of $18,491,000, net of issuance costs. Prior to each closing, any change in the value of Tranche Right I was recorded as other financing expense. The fair value of the portion of the Tranche Right I settled at each closing was reclassified to Series A Preferred Stock. The Company recognized income of $261,000 related to the mark to market of Tranche Right I during the year ended December 31, 2014, which is included in other financing expense.

Tranche Right II was initially recorded as a liability of $4,095,000 as the purchase price of the additional shares was less than the estimated price of the Series A Preferred Stock at the expected settlement date. The Company recognized expense of $2,210,000 related to the mark to market of Tranche Right II during the year ended December 31, 2014, which is included in other financing expense.

In February 2015, Tranche Right II was settled when the Company closed the final issuance of Series A Preferred Stock. The Company recognized expense of $9,750,000 related to the mark to market of Tranche Right II during the period ended March 31, 2015, which is included in other financing expense. The fair value of the Tranche Right II settled at closing was reclassified to Series A Preferred Stock. The initial carrying amount of the Series A Preferred Stock issued upon the closing of

9. Redeemable Convertible Preferred Stock (Continued)

Tranche Right II amounted to approximately $36,054,000 which exceeds the redemption value, therefore the carrying value is not being subsequently adjusted. However, the Company has reflected accrued dividends of approximately $237,000 related to this issuance in the net loss attributable to common shareholders for the three months ended March 31, 2015.

Series B Preferred Stock

At March 31, 2015, 10,000,000 shares of Series B Preferred Stock were authorized, issued and outstanding. These shares were issued for $3.00 per share. This issuance resulted in cash proceeds of $29,942,000, net of issuance costs of $58,000. Additionally, a discount of $5,000,000 was recorded against the proceeds as the amount paid by the purchaser was in excess of fair value of the Series B Preferred Stock at issuance. The Series B Preferred Stock has a liquidation preference amount of $30,322,000.

Preferred Stock

The rights, preferences, and privileges of the Preferred Stock are listed below:

Conversion

Shares of Preferred Stock are convertible at any time at the option of the holder into such number of shares as is determined by dividing the original issuance price by the conversion price in effect at the time. The original conversion price is the original price, or $1.00 for Series A Preferred Stock and $3.00 for Series B Preferred Stock, subject to adjustments to reflect the issuance of Common Stock, options, warrants, or other rights to subscribe for or to purchase Common Stock for a consideration per share, less than the conversion price then in effect and subsequent stock dividends and stock splits. In addition any reorganization, recapitalization, reclassification, consolidation or merger in which common stock is exchanged for securities, cash or other property.

All outstanding shares of Preferred Stock are automatically converted upon the completion of either an initial public offering resulting in gross proceeds to the Company of at least $50.0 million or the vote or written consent of 60% of the then outstanding shares of preferred stock.

Dividends

Holders of Preferred Stock are entitled to receive, before any cash is paid out or set aside for any Common Stock, cash dividends at a rate of 8% of the original purchase price per share annually (the "Accruing Dividends"). The dividends accrue cumulatively on a daily basis and are payable only when, and if, declared by the Board of Directors or upon liquidation or redemption.

In addition, the holders of Preferred Stock are entitled to additional dividends based on dividends declared to common stockholders, thereby giving the preferred stockholders the right to participate in undistributed earnings of the Company above the stated per share dividend rate. The preferred stockholders do not have a contractual obligation to share in the losses of the Company

No dividends have been declared since the Company's inception. Aggregate cumulative preferred dividends on Preferred Stock at March 31, 2015 were $2,138,000.

9. Redeemable Convertible Preferred Stock (Continued)

Redemption

The Preferred Stock is redeemable at the option of the holder after the redemption date of February 2021. The redemption value of the Preferred Stock is equal to $3.00 per share for Series B Preferred Stock and $1.00 per share for Series A Preferred Stock plus any accrued but unpaid dividends. Accordingly, the Preferred Stock is being accreted to redemption value through its redemption date, including accruals for cumulative dividend rights. If the initial carrying value exceeds the redemption value the carrying value is not adjusted.

Liquidation Preference

Holders of Series B Preferred Stock and Series A Preferred Stock have preference to the assets of the Company in the event of any voluntary or involuntary liquidation, dissolution or winding-up of the Company, equal to $3.00 per share for Series B Preferred Stock and $1.00 per share for Series A Preferred Stock, plus any accrued but unpaid dividends, whether or not declared, plus any dividends declared but unpaid thereon, on a pari passu basis. After the payment of the preference amounts to the holders of Series B Preferred Stock and Series A Preferred Stock, the remaining assets of the Company are to be distributed among the holders of Series A Preferred Stock and holders of Common Stock on a pro rata basis. However, if the aggregate amount which the holders of Series A Preferred Stock would be entitled to receive exceeds $2.50 per share (subject to appropriate adjustment in the event of any stock dividend, stock split, combination, reclassification or other similar event) (the "Maximum Participant Amount"), each holder of Series A Preferred Stock will receive the greater of the Maximum Participant Amount or the amount such holder would have received if all shares of Series A Preferred Stock had been converted into Common Stock immediately prior to such liquidation.

Voting Rights

Holders of Series A Preferred Stock and Series B Preferred Stock are entitled to vote as a single class with the holders of Common Stock on all matters submitted for vote to the Stockholders of the Company. The holders of Preferred Stock are entitled to one vote for each equivalent common share on an as-converted basis. In addition, the holders of Series A Preferred Stock are entitled to elect two (2) directors. The remaining directors shall be elected by the holders of Common Stock voting together with the holders of the Series B Preferred Stock as one class on an as-converted basis.

The holders of Series A Preferred Stock and Series B Preferred Stock have certain protective rights as defined. These protective rights require the Required Vote before action can be taken to (i) increase or decrease the number of shares of Series A Preferred Stock or Series B Preferred Stock that the Company has authority to issue, (ii) change the par value of the Series A Preferred Stock or Series B Preferred Stock, (iii) amend the Certificate of Incorporation in any way that adversely affects the holders of the Series A Preferred Stock or Series B Preferred Stock.

10. Common Stock

As of December 31, 2013, December 31, 2014, and March 31, 2015, the Company had authorized 10,000, 65,000,000 and 75,000,000 shares of Common Stock, respectively at $0.001 par value per share.

10. Common Stock (Continued)

General

The voting, dividend and liquidation rights of the holders of the Common Stock are subject to and qualified by the rights, powers and preferences of the holders of Preferred Stock. The Common Stock has the following characteristics:

Voting

The holders of shares of Common Stock are entitled to one vote for each share of Common Stock held at all meetings of stockholders and written actions in lieu of meetings.

Dividends

The holders of shares of Common Stock are entitled to receive dividends, if and when declared by the Board of Directors. Cash dividends may not be declared or paid to holders of shares of Common Stock until all accrued unpaid dividends on Series A Preferred Stock and Series B Preferred Stock have been paid in accordance with their terms. No dividends have been declared or paid by the Company since its inception.

Liquidation

After payment to of their respective liquidation preferences to the holders of shares of Series A Preferred Stock and Series B Preferred Stock, the holders of shares of Common Stock are entitled to share ratably in the Company's remaining assets available for distribution to its stockholders in the event of any voluntary or involuntary liquidation, dissolution or winding up of the Company or upon occurrence of a deemed liquidation event.

Shares reserved for future issuance

	As of December 31,		As of March 31, 2015 (unaudited)
	2013	2014	
Shares reserved for Series A Preferred Stock outstanding	—	25,000,000	45,000,000
Shares reserved for future issuances of Series A Preferred Stock	—	20,000,000	—
Shares reserved for Series B Preferred Stock outstanding	—	—	10,000,000
Shares reserved for vesting of restricted stock awards under the Founder Agreements	—	4,540,625	4,087,500
Shares reserved for vesting of restricted stock awards under the 2014 Option and Stock Plan	—	6,419,395	5,795,916
Shares reserved for issuances under the 2014 Option and Stock Plan	—	1,236,888	1,236,888
	—	57,196,908	66,120,304

11. Stock-based compensation

2014 Stock Option and Grant Plan

In January 2014 the Company adopted the Voyager Therapeutics, Inc. 2014 Stock Option and Grant Plan (the "2014 Plan"), under which it may grant incentive stock options, non-qualified stock

11. Stock-based compensation (Continued)

options, restricted stock awards, unrestricted stock awards, or restricted stock units to purchase up to 3,500,000 shares of Common Stock to employees, officers, directors and consultants of the Company.

In April 2014 the Company amended the Plan to allow for the issuance of up to 6,000,000 shares of Common Stock. In August 2014 the Company further amended the Plan to allow for the issuance of up to 8,500,000 shares of Common Stock. During the year ended December 31, 2014, the Company issued only Restricted Stock Awards under the Plan. The Company did not grant any awards during the first quarter of 2015.

The terms of stock awards agreements, including vesting requirements, are determined by the Board of Directors and are subject to the provisions of the 2014 Plan. Restricted stock awards granted by the Company generally vest based on each grantee's continued service with the Company during a specified period following grant. Awards granted to employees generally vest over four years, with 25% vesting on the one year anniversary and 75% vesting ratably, on a monthly basis, over the remaining three years. Awards granted to non-employee consultants generally vest monthly over a period of one to four years.

During the year ended December 31, 2014, the Company granted a total of 6,791,500 shares of restricted stock to employees and 471,612 shares of restricted stock, to non-employee consultants at an original issuance price of $0.01 per share. The Company did not grant any awards in the period ended March 31, 2015. The Company did not have a stock option or grant plan as of December 31, 2013 and, as such, no stock restricted stock was issued during 2013. As of December 31, 2014 and as of March 31, 2015, there were 1,236,888 shares available for future issuance under the 2014 Plan.

Founder Awards

In January 2014 the Company issued 5,050,000 shares of restricted stock to its Founders at an original issuance price of $0.001 per share. Of the total restricted shares awarded to the Founders, 3,550,000 shares generally vest over one to four years, based on each Founder's continued service to the Company in varying capacity as a Scientific Advisory Board member, consultant, director, officer or employee, as set forth in each grantee's individual restricted stock purchase agreement. The remaining 1,500,000 of the shares issued will begin vesting upon the achievement of certain performance objectives as well as continued service to the Company, as set forth in the agreements.

These performance conditions are tied to certain milestone events specific to the Company's corporate goals, including but not limited to preclinical and clinical development milestones related to the Company's product candidates. Stock-based compensation expense associated with these performance-based shares will be recognized when the achievement of the performance condition is considered probable, using management's best estimates. As of December 31, 2014 and March 31, 2015, management has concluded that achievement of such performance-based milestones was not probable. Accordingly, no stock-based compensation expense was recorded as of December 31, 2014 and March 31, 2015 related to these shares.

Stock-based compensation expense

The fair value of each restricted stock award is determined based on the market value of the Company's common stock on the grant date. Restricted stock awards granted to non-employees are

11. Stock-based compensation (Continued)

revalued at each period end as they vest. The stock-based compensation expense was recognized as follows (in thousands):

	Period from June 19, 2013 (Inception) to December 31, 2013	Year Ended December 31, 2014	Three Months Ended March 31, 2014	Three Months Ended March 31, 2015
			(unaudited)	
Research and development	$ —	$ 297	$ 19	$ 225
General and administrative	—	128	12	77
Total stock-compensation expense	$ —	$ 425	$ 31	$ 302

Restricted Stock Awards

The company did not issue awards or record stock-based compensation expense during the year ended December 31, 2013. A summary of the status of and changes in unvested restricted stock as of December 31, 2014 and March 31, 2015 was as follows:

	Shares	Weighted Average Grant Date Fair Value Per Share
Unvested restricted common stock as of December 31, 2013	—	—
Issued	12,313,112	$ 0.18
Vested	(1,353,092)	$ 0.16
Forfeited	—	—
Repurchased	—	—
Unvested restricted common stock as of December 31, 2014	10,960,020	$ 0.18
Issued	—	
Vested	(1,076,604)	$ 0.15
Repurchased	—	
Unvested restricted common stock as of March 31, 2015 (unaudited)	9,883,416	$ 0.18

11. Stock-based compensation (Continued)

The expense related to awards granted to employees and non-employees was $231,000 and $194,000, respectively, for the year ended December 31, 2014. The expense related to awards granted to employees and non-employees was $96,000 and $206,000, respectively, for the three months ended March 31, 2015.

As of March 31, 2015, the Company had unrecognized stock-based compensation expense related to its unvested restricted stock awards of $3,573,000, which is expected to be recognized over the remaining weighted average vesting period of 2.92 years.

12. 401(k) Savings Plan

The Company has a defined-contribution savings plan under Section 401(k) of the Internal Revenue Code (the "401(k) Plan"). The 401(k) Plan covers all employees who meet defined minimum age and service requirements, and allows participants to defer a portion of their annual compensation on a pretax basis. As currently established, the Company is not required to make and has not made any contributions to the 401(k) Plan to date.

13. Income taxes

A reconciliation of the expected income tax (benefit) computed using the federal statutory income tax rate to the Company's effective income tax rate is as follows:

	Period Ended December 31, 2013	Year Ended December 31, 2014
Income tax computed at federal statutory tax rate	34.0%	34.0%
State taxes, net of federal benefit	6.3%	5.5%
General business credit carryovers	2.4%	2.2%
Non-deductible expenses	(0.7)%	(5.0)%
Change in valuation allowance	(42.0)%	(36.7)%
	0.0%	0.0%

13. Income taxes (Continued)

The principal components of the Company's deferred tax assets and liabilities consist of the following at December 31, 2013 and 2014 (in thousands):

	Period Ended December 31, 2013	Year Ended December 31, 2014
Deferred tax assets:		
Net operating loss carryforwards	$ 1,470	$ 6,643
Tax credit carryforwards	140	673
Deferred rent	—	626
Intangibles	—	327
Non-deductible expenses	1	79
Total deferred tax assets	1,611	8,348
Less valuation allowance	(1,611)	(7,599)
Net deferred tax assets	—	749
Deferred tax liabilities—depreciation and amortization	—	(749)
Net deferred taxes	$ —	$ —

The Company has incurred net operating losses ("NOL") since June 2013. At December 31, 2014, the Company had federal and state net operating loss carryforwards of $17,060,000 and $15,963,000, respectively, which expire beginning in 2033. As of December 31, 2014, the Company had federal and state research and development tax credits carryforwards of $448,000 and $341,000, respectively, which expire beginning in 2028.

Under the provisions of the Internal Revenue Code, certain substantial changes in the Company's ownership may result in a limitation on the amount of NOL carryforwards and research and development credit carryforwards that may be utilized annually to offset future taxable income and taxes payable. The Company has not determined whether a limitation has occurred.

As required by ASC 740, management has evaluated the positive and negative evidence bearing upon the realizability of its deferred tax assets, which principally comprise NOL carryforwards and research and development credit carryforwards. Management has determined that it is more likely than not that the Company will not recognize the benefits of its federal and state deferred tax assets, and as a result, a valuation allowance of $1,611,000 and $7,599,000 has been established at December 31, 2013 and 2014, respectively. The change in the valuation allowance was $5,988,000 for the year ended December 31, 2014 was primary due to additional operating losses.

The Company applies ASC 740 related to accounting for uncertainty in income taxes. The Company's reserves related to income taxes are based on a determination of whether, and how much of, a tax benefit take by the Company in its tax filings or positions is more likely than not to be realized following resolution of any potential contingencies present related to the tax benefit. At December 31, 2014 and 2013, the Company had no unrecognized tax benefits. Interest and penalty charges, if any, related to unrecognized tax benefits would be classified as income tax expense in the accompanying statements of operations

The Company has not as yet conducted a study of its research and development credit carryforwards. This study may result in an adjustment to the Company's research and development

13. Income taxes (Continued)

credit carryforwards; however, until a study is completed and any adjustment is known, no amounts are being presented as an uncertain tax position. A full valuation allowance has been provided against the Company's research and development credits, and if an adjustment is required, this adjustment would be offset by an adjustment to the valuation allowance. Thus, there would be no impact to the balance sheets or statements of operations if an adjustment were required.

The Company files income tax returns in the U.S. federal tax jurisdiction and the Massachusetts state jurisdiction. Since the Company is in a loss carryforward position, the Company is generally subject to examination by the U.S. federal, state and local income tax authorities for all tax years in which a loss carryforward is available. The Company did not have any international operations as of December 31, 2014. There are federal or state audits in process.

14. Related-party transactions

Since inception, the Company received consulting and management services from one of its investors. In January 2014, the Company issued 2,000,000 shares of common stock as partial compensation for these services. The fair value of the shares was approximately $238,000.

The total amount of consulting and management services provided by this investor amounted to $2,379,000 and $1,280,000 during the period and year ended December 31, 2013 and 2014 and $355,000 and $69,000 during the three months ended March 31, 2014 and 2015, respectively. As of December 31, 2013, December 31, 2014, and March 31, 2015, the Company included approximately $514,000, $90,000, and $69,000, respectively, in accounts payable related to service fees charged by this investor.

15. Subsequent events

For the purposes of the financial statements as of December 31, 2013, December 31, 2014 and March 31, 2015 and the periods and year then ended, the Company has evaluated the subsequent events through June 19, 2015, the date these audited financial statements were issued.

Series B Preferred Stock

In April 2015, the Company issued and sold 20,000,001 shares of its Series B Preferred Stock, to new investors, for an aggregate purchase price of $60,000,003.

2014 Stock Plan

In April 2015, the Company amended the 2014 Stock Plan to allow for the issuance of an additional 200,000 shares of Common stock. The amendment increased the total shares available under the plan to 8,700,000 shares of Common Stock.

Shares

Common stock

PROSPECTUS

Cowen and Company **Piper Jaffray**

Nomura

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, 2015

Through and including , 2015 (the 25th day after the date of this prospectus), all dealers that buy, sell or trade in these securities, whether or not participating in this offering, may be required to deliver a prospectus. This is in addition to the dealers' obligation to deliver a prospectus when acting as an underwriter and with respect to an unsold allotment or subscription.

PART II

Information not required in prospectus

Item 13. Other Expenses of Issuance and Distribution

The following table sets forth the costs and expenses, other than the underwriting discounts and commissions, payable by the registrant in connection with the sale of common stock being registered. All amounts are estimates except for the Securities and Exchange Commission, or SEC, registration fee, the FINRA filing fee and NASDAQ listing fee.

Item	Amount to be paid
SEC registration fee	$ *
FINRA filing fee	*
Listing fee	*
Printing and engraving expenses	*
Legal fees and expenses	*
Accounting fees and expenses	*
Blue Sky fees and expenses (including legal fees)	*
Transfer agent and registrar fees and expenses	*
Miscellaneous expenses	*
Total	$ *

* To be provided by amendment

Item 14. Indemnification of Directors and Officers

Section 145(a) of the Delaware General Corporation Law provides, in general, that a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation), because he or she is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with such action, suit or proceeding, if he or she acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful.

Section 145(b) of the Delaware General Corporation Law provides, in general, that a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor because the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees) actually and reasonably incurred by the person in connection with the defense or settlement of such action or suit if he or she acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation, except that no indemnification shall be made with respect to any claim, issue or matter as to which he or she shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of all of the circumstances of the case,

he or she is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or other adjudicating court shall deem proper.

Section 145(g) of the Delaware General Corporation Law provides, in general, that a corporation may purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against such person and incurred by such person in any such capacity, or arising out of his or her status as such, whether or not the corporation would have the power to indemnify the person against such liability under Section 145 of the Delaware General Corporation Law.

In connection with the sale of common stock being registered hereby, we have entered into indemnification agreements with each of our directors and our executive officers. These agreements will provide that we will indemnify each of our directors and such officers to the fullest extent permitted by law and the Charter and amended and restated certificate of incorporation and bylaws.

We also maintain a general liability insurance policy which covers certain liabilities of directors and officers of our company arising out of claims based on acts or omissions in their capacities as directors or officers.

In any underwriting agreement we enter into in connection with the sale of common stock being registered hereby, the underwriters will agree to indemnify, under certain conditions, us, our directors, our officers and persons who control us within the meaning of the Securities Act of 1933, as amended, against certain liabilities.

Item 15. Recent Sales of Unregistered Securities

Since our inception until the filing of this registration statement, we have issued the following securities that were not registered under the Securities Act:

Issuances of Capital Stock

On June 26, 2013, we issued 10,000 shares of our common stock to one investor for an aggregate consideration of $10. On January 9, 2014, we issued 2,000,000 shares of our common stock to one investor for an aggregate consideration of $2,000.

On January 9, 2014, we issued 6,500,000 shares of our Series A convertible preferred stock to one investor for an aggregate consideration of $6,500,000, including the exchange of convertible promissory notes of approximately $2,929,000. On April 16, 2014, we issued 6,000,000 shares of our Series A convertible preferred stock to one investor for $6,000,000. On August 1, 2014, we issued 6,000,000 shares of our Series A convertible preferred stock to one investor for $6,000,000. On November 25, 2014, we issued 6,500,000 shares of our Series A convertible preferred stock to one investor for $6,500,000. On February 6, 2015, we issued 20,000,000 shares of our Series A convertible preferred stock to one investor for $20,000,000.

On January 30, 2014, we issued 100,000 shares of our common stock in connection with entering into a license agreement.

On February 11, 2015, we issued 10,000,000 shares of our Series B convertible preferred stock to one investor for $30,000,000. On April 9, 2015, we issued an aggregate of 20,000,001 shares of our Series B convertible preferred stock to nine investors for aggregate consideration of $60,000,003.

No underwriters were used in the foregoing transactions. All sales of securities described above were made in reliance upon the exemption from registration provided by Section 4(2) of the Securities Act (and/or Regulation D promulgated thereunder) for transactions by an issuer not involving a public

offering. All of the foregoing securities are deemed restricted securities for the purposes of the Securities Act.

Grants of Stock Options and Restricted Stock

Since our inception, we have granted an aggregate of 12,313,112 shares of restricted stock. The issuances of these securities were exempt either pursuant to Rule 701, as a transaction pursuant to a compensatory benefit plan, or pursuant to Section 4(2), as a transaction by an issuer not involving a public offering.

Item 16. Exhibits and Financial Statement Schedules

(a) Exhibits. See the Exhibit Index attached to this Registration Statement, which is incorporated by reference herein.

(b) Financial Statement Schedules. Schedules not listed above have been omitted because the information required to be set forth therein is not applicable or is shown in the financial statements or notes thereto.

Item 17. Undertakings

The undersigned Registrant hereby undertakes to provide to the underwriters at the closing specified in the underwriting agreement certificates in such denominations and registered in such names as required by the underwriters to permit prompt delivery to each purchaser.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Registrant pursuant to the foregoing provisions, or otherwise, the Registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act, and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer, or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question of whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

The undersigned Registrant hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this Registration Statement in reliance upon Rule 430A and contained in a form of prospectus filed by the Registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this Registration Statement as of the time it was declared effective.

(2) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant has duly caused this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of Cambridge, State of Massachusetts, on this day of , 2015.

VOYAGER THERAPEUTICS, INC.

By: _____

Steven Paul, M.D.
Chief Executive Officer and President

SIGNATURES AND POWER OF ATTORNEY

We, the undersigned directors and officers of Voyager Therapeutics, Inc. (the "Company"), hereby severally constitute and appoint Steven Paul, M.D. and J. Jeffrey Goater, and each of them singly, our true and lawful attorneys, with full power to them, and to each of them singly, to sign for us and in our names in the capacities indicated below, the registration statement on Form S-1 filed herewith, and any and all pre-effective and post-effective amendments to said registration statement, and any registration statement filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended, in connection with the registration under the Securities Act of 1933, as amended, of equity securities of the Company, and to file or cause to be filed the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as each of us might or could do in person, and hereby ratifying and confirming all that said attorneys, and each of them, or their substitute or substitutes, shall do or cause to be done by virtue of this Power of Attorney.

Pursuant to the requirements of the Securities Act, this Registration Statement on Form S-1 has been signed by the following persons in the capacities and on the dates indicated.

Signature	Title	Date
_____ Steven Paul, M.D.	President, Chief Executive Officer and Director (Principal Executive Officer)	, 2015
_____ J. Jeffrey Goater	Senior Vice President, Finance and Business Development (Principal Financial and Accounting Officer)	, 2015
_____ Mark Levin	Director, Chairman of the Board	, 2015
_____ Michael Higgins	Director	, 2015
_____ James Geraghty	Director	, 2015
_____ Perry Karsen	Director	, 2015

EXHIBIT INDEX

Exhibit number	Description of exhibit
1.1*	Form of Underwriting Agreement.
3.1*	Certificate of Incorporation (as currently in effect).
3.2*	Form of Amended and Restated Certificate of Incorporation (to be in effect upon completion of this offering).
3.3*	Bylaws (as currently in effect).
3.4*	Form of Amended and Restated Bylaws (to be in effect upon completion of this offering).
4.1*	Form of Common Stock Certificate.
4.2*	Second Amended and Restated Investors' Rights Agreement by and among the Registrant and certain of its stockholders dated as of April 10, 2015.
5.1*	Opinion of Goodwin Procter LLP.
10.1*#	2014 Stock Option and Grant Plan and forms of award agreements thereunder.
10.2*#	2015 Stock Option and Incentive Plan and forms of award agreements thereunder.
10.3†##+	Collaboration Agreement by and between the Registrant and Genzyme Corporation, dated February 11, 2015.
10.4†+	Exclusive License Agreement by and between the Registrant and the University of Massachusetts, dated January 30, 2014.
10.5*	Lease Agreement by and between the Registrant and UP 45/75 Sidney Street, LLC, dated as of April 1, 2014.
10.5*	Offer Letter by and between the Registrant and Steven Paul, M.D., dated July 24, 2014.
10.6*	Offer Letter by and between the Registrant and Bernard Ravina, M.D., dated January 15, 2014.
10.7*	Offer Letter by and between the Registrant and Robert Pietrusko, Pharm. D., dated May 13, 2014.
10.13*	Form of Indemnification Agreement to be entered into between the Registrant and its directors.
10.14*	Form of Indemnification Agreement to be entered into between the Registrant and its executive officers.
10.15†	License Agreement, by and between the Registrant and ReGenX Biosciences, LLC, dated May 28, 2015.
23.1*	Consent of Ernst & Young LLP, Independent Registered Public Accounting Firm.
23.2*	Consent of Goodwin Procter LLP (included in Exhibit 5.1).
24.1*	Power of Attorney (included on signature page).

* To be filed by amendment.

† Portions of this exhibit (indicated by asterisks) have been omitted pursuant to a request for confidential treatment and this exhibit has been submitted separately to the SEC.

Represents management compensation plan.

Certain exhibits and schedules to these agreements have been omitted from the registration statement pursuant to Item 601(b)(2) of Regulation S-K. The registrant will furnish copies of any of the exhibits and schedules to the Securities and Exchange Commission upon request.

+ Previously filed.

LICENSE AGREEMENT

This LICENSE AGREEMENT ("Agreement") is entered into as of May 28, 2014 ("Effective Date") by and between ReGenX Biosciences, LLC, a limited liability company organized under the laws of the State of Delaware, with offices at 750 17th Street, NW, Suite 1100, Washington, DC 20006 ("Licensor"), and Voyager Therapeutics, Inc., a corporation organized under the laws of the State of Delaware, with offices at 75 Sidney Street, Cambridge, MA 02139 ("Licensee"). Licensor and Licensee are hereinafter referred to individually as a "Party" and collectively as the "Parties."

WHEREAS, Licensor has rights under certain patents pertaining to various recombinant adeno-associated virus vectors;

WHEREAS, Licensee desires to obtain from Licensor, and Licensor is willing to grant to Licensee, (a) a non-exclusive research license to conduct certain research to identify and select Specified Vectors for specified indications and (b) an option to obtain a non-exclusive license to research, develop, and commercialize Licensed Products for specified indications under the terms set forth herein;

NOW, THEREFORE, in consideration of the promises and covenants contained in this Agreement, and intending to be legally bound, the Parties hereby agree as follows:

ARTICLE 1: DEFINITIONS

1.1 "AAVrh10" means (a) the recombinant adeno-associated virus serotype rh10 vector with the specified sequence set forth in GenBank [***] and (b) any recombinant adeno-associated virus derivatives of such serotype rh10 vector that are covered by the claims of the Licensed Research Patents.

1.2 "AAV Materials" means recombinant adeno-associated virus serotype vectors, and any materials that are made or used for the sole purpose of making recombinant adeno-associated virus serotype vectors, in each case, which, in the absence of the license granted pursuant to Section 2.1, would infringe or is covered by at least one Valid Claim of the Licensed Research Patents in the country of manufacture or use.

1.3 "Affiliate" means any legal entity directly or indirectly, during the term of this Agreement, controlling, controlled by, or under common control with another entity. For purposes of this Agreement, "control" means the direct or indirect ownership of more than 50% of the outstanding voting securities of a legal entity, or the right to receive more than 50% of the profits or earnings of a legal entity, or the right to control the policy decisions of a legal entity. For clarity, an entity may be or become an Affiliate of an entity and may cease to be an Affiliate of an entity, in each case, during the term of this Agreement. Notwithstanding the foregoing, any person or entity that would otherwise qualify as an Affiliate of Licensee hereunder by this definition will not be deemed to be, and will not be treated as, an Affiliate of Licensee if (i) the primary business of such person or entity is investing in securities, debt, or other investment vehicles; provided that a person or entity that satisfies the criteria under this clause (i) who, directly or indirectly, during the term of this Agreement, controls Licensee will be deemed an Affiliate under Sections 6.6 and 8.4.1 during the period of time in which such person or entity

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CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT UNDER RULE 406 PROMULGATED UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

controls Licensee; or (ii) such person or entity is a portfolio company of a person or entity that satisfies the criteria under clause (i). Licensee represents and warrants that, as of the Effective Date, Third Rock Ventures and its related funds satisfy the criteria under clause (i) of the preceding sentence; and, as such, the Parties agree that, for so long as the foregoing representation and warranty remains true, Third Rock Ventures and its related funds will be excluded from classification as Affiliates of Licensee under this Agreement to the extent provided in the immediately prior sentence.

1.4 "Calendar Quarter" means each three-month period or any portion thereof, beginning on January 1, April 1, July 1, and October 1.

1.5 "Commercial Field" means the treatment or prevention of a Disease Indication (if and when a Commercial Option is exercised for such Disease Indication by Licensee under Section 2.3) in human beings by *in vivo* gene therapy with the applicable Specified Vector selected for the applicable Disease Indication.

1.6 "Commercial Option" has the meaning set forth in Section 2.3.

1.7 "Confidential Information" means and includes all technical information, inventions, developments, discoveries, software, know-how, methods, techniques, formulae, animate and inanimate materials, data, processes, finances, business operations or affairs, and other proprietary ideas, whether or not patentable or copyrightable, of either Party that are (a) marked or otherwise identified as confidential or proprietary at the time of disclosure in writing; or (b) if disclosed orally, visually, or in another non-written form, identified as confidential at the time of disclosure and summarized in reasonable detail in writing as to its general content within 30 days after original disclosure. The Parties acknowledge that (i) the terms and conditions of this Agreement and (ii) the records and reports referred to in Section 3.7 will be deemed the Confidential Information of both Parties, regardless of whether such information is marked or identified as confidential. Notwithstanding the foregoing, Confidential Information will not include the following, in each case, to the extent evidenced by competent written proof of the Receiving Party:

1.7.1 information that was already known to the Receiving Party, other than under an obligation of confidentiality, at the time of disclosure by the Disclosing Party;

1.7.2 information that was generally available to the public or otherwise part of the public domain at the time of its disclosure to the Receiving Party;

1.7.3 information that became generally available to the public or otherwise part of the public domain after its disclosure, other than through any act or omission of the Receiving Party in breach of this Agreement;

1.7.4 information that is independently discovered or developed by the Receiving Party without the use of Confidential Information of the Disclosing Party; or

1.7.5 information that was disclosed to the Receiving Party, other than under an obligation of confidentiality, by a Third Party who had no obligation to the Disclosing Party not to disclose such information to others.

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT UNDER RULE 406 PROMULGATED UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

1.8 "Disclosing Party" has the meaning set forth in Section 5.1.

1.9 "Disease Indication(s)" means one or more of the following indications: (a) Friedreich's Ataxia that is treated or prevented by administration of the applicable recombinant adeno-associated virus serotype vector directly to the central nervous system (brain and spinal cord) ("Friedreich's Ataxia (CNS)"), (b) Friedreich's Ataxia that is treated or prevented by administration of the applicable recombinant adeno-associated virus serotype vector by any route except administration directly to the central nervous system (brain and spinal cord) ("Friedreich's Ataxia (Systemic)"), (c) Huntington's Disease, and (d) Amyotrophic Lateral Sclerosis.

1.10 "Domain Antibody" [***].

1.11 "FDA" means the United States Food and Drug Administration, or a successor agency in the United States with responsibilities comparable to those of the United States Food and Drug Administration.

1.12 "GSK Agreement" means that certain License Agreement entered into between Licensor and SmithKline Beecham Corporation, effective on March 6, 2009, as amended by that certain Amendment to License Agreement dated April 15, 2009, and as amended from time to time.

1.13 "Licensed Commercial Patents" means, on a Specified Vector-by-Specified Vector basis, to the extent they cover such Specified Vector, (a) all United States patents and patent applications listed in Exhibit D (or on Exhibit A, until such time as this Agreement is amended to add Exhibit D in accordance with Section 2.3.3), including patents arising or issuing from such patent applications; and (b) any re-examination certificates thereof, and their foreign counterparts and extensions, continuations, divisionals, and re-issue applications; provided that "Licensed Commercial Patents" will not include any claim of a patent or patent application covering any Manufacturing Technology.

1.14 "Licensed Patents" means the Licensed Commercial Patents or Licensed Research Patents, as applicable.

1.15 "Licensed Product" means (a) any product using the applicable Specified Vector capsid protein that is made, made for, used, sold, offered for sale, or imported by Licensee, its Affiliates, and any of its or their Sublicensees, the manufacture, use, sale, offer for sale, or import of which product, in the absence of the license granted pursuant to this Agreement, would infringe or is covered by at least one Valid Claim of the Licensed Commercial Patents in the country of manufacture, use, sale, offer for sale, or import; or (b) any service sold by Licensee, its Affiliates, and any of its or their Sublicensees with respect to the administration of any product using the applicable Specified Vector capsid protein to patients that, in the absence of the licenses granted pursuant to this Agreement, would infringe or is covered by at least one Valid Claim of the Licensed Commercial Patents in the country of sale.

1.16 "Licensed Research Patents" means (a) all United States patents and patent applications listed in Exhibit A, including patents arising or issuing from such patent applications; and (b) any re-examination certificates thereof, and their foreign counterparts and extensions, continuations,

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT UNDER RULE 406 PROMULGATED UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

divisionals, and re-issue applications; provided that "Licensed Research Patents" will not include any claim of a patent or patent application covering any Manufacturing Technology.

1.17 "Manufacturing Technology" means any and all patents, patent applications, know-how, and all intellectual property rights associated therewith that are owned or controlled by Licensor, and including all tangible embodiments thereof, that are necessary or useful for the manufacture of adeno-associated viruses, adeno-associated virus vectors, research or commercial reagents related thereto, Licensed Products, or other products, including manufacturing processes, technical information relating to the methods of manufacture, protocols, standard operating procedures, batch records, assays, formulations, quality control data, specifications, scale up, any and all improvements, modifications, and changes thereto, and any and all activities associated with such manufacture. Any and all chemistry, manufacturing, and controls (CMC), drug master files (DMFs), or similar materials provided to regulatory authorities and the information contained therein are deemed Manufacturing Technology.

1.18 "NDA" means a New Drug Application filed with the FDA as described in 21 C.F.R. § 314, a Biological License Application (BLA) pursuant to 21 C.F.R. § 601.2, or any equivalent or any corresponding application for regulatory approval in any country or regulatory jurisdiction other than the United States.

1.19 "Net Sales" means the gross receipts from sales or other disposition of a Licensed Product (including fees for services within the definition of "Licensed Product") by Licensee and/or its Affiliates and/or any Sublicensees to Third Parties less the following deductions that are directly attributable to a sale, specifically and separately identified on an invoice or other documentation and actually borne by Licensee, its Affiliates, or any Sublicensees: (a) [***]; (b) [***]; (c) [***];

and (d) [***]. [***]. In the event consideration other than cash is paid to Licensee, its Affiliates, or any Sublicensees, for purposes of determining Net Sales, the Parties shall use the cash consideration that Licensee, its Affiliates, or any Sublicensees would realize from an unrelated buyer in an arm's length sale of an identical item sold in the same quantity and at the time and place of the transaction, as determined jointly by Licensor and Licensee based on transactions of a similar type and standard industry practice, if any.

1.20 "Penn Agreement" means that certain License Agreement entered into between Licensor and The Trustees of the University of Pennsylvania, effective on February 24, 2009, as amended by that letter agreement dated March 6, 2009, and as amended from time to time.

1.21 "Phase 3 Clinical Trial" means a pivotal clinical trial in humans performed to gain evidence with statistical significance of the efficacy of a product in a target population, and to obtain expanded evidence of safety for such product that is needed to evaluate the overall benefit-risk relationship of such product, to form the basis for approval of an NDA and to provide an adequate basis for physician labeling, as described in 21 C.F.R. § 312.21(c) or the corresponding regulation in jurisdictions other than the United States.

1.22 "Prosecute" means preparation, filing, and prosecuting patent applications and maintaining patents, including any reexaminations, reissues, oppositions, inter partes review, and interferences.

1.23 "Receiving Party" has the meaning set forth in Section 5.1.

1.24 "ReGenX Licensors" means SmithKline Beecham Corporation (or any successor thereto under the GSK Agreement) and The Trustees of the University of Pennsylvania (or any successor thereto under the Penn Agreement).

1.25 "Research Field" means Licensee's internal research and pre-clinical development for the treatment or prevention of any of the Disease Indications in humans by *in vivo* gene therapy using AAV Materials. Notwithstanding the foregoing, "Research Field" specifically excludes the use of AAVrh10 for the treatment or prevention of Friedreich's Ataxia (Systemic). Furthermore, "Research Field" specifically excludes (without limitation) (a) all human clinical trial use, diagnostic use, therapeutic use, and prophylactic use, and (b) any commercial uses.

1.26 "Research Term" means, on a Disease Indication-by-Disease Indication basis, a period beginning with the Effective Date and ending on the earlier of (a) the Grant Date, if any, with respect to the applicable Disease Indication and (b) the 18-month anniversary of the Effective Date, or if the Research Term is extended pursuant to Section 2.2, the 30-month anniversary of the Effective Date.

1.27 "Retained Rights" has the meaning set forth in Section 2.4.

1.28 "Secondary Disease Indications" collectively mean (a) Friedreich's Ataxia (Systemic), (b) Huntington's Disease, and (c) Amyotrophic Lateral Sclerosis.

1.29 "Specified Vector" means the recombinant adeno-associated virus serotype vector with a specified sequence set forth in GenBank that is selected by Licensee pursuant to Section 2.3 and which is specified on Exhibit C (to be attached hereto as of the applicable Grant Date as provided in Section 2.3).

1.30 "Sublicensee" means (i) any Third Party or Affiliate to whom Licensee grants a sublicense of some or all of the rights granted to Licensee under this Agreement as permitted by this Agreement; and (ii) any other Third Party or Affiliate to whom a sublicensee described in clause (i) has granted a further sublicense as permitted by this Agreement.

1.31 "Third Party" means any person or entity other than a Party to this Agreement or Affiliates of a Party to this Agreement.

1.32 "Third Party Collaborator" means a Third Party with whom Licensee has entered into a collaboration for a particular Disease Indication under which (a) research and development activities will be performed on a shared basis during the Research Term for the purpose of Licensee and such Third Party determining which Specified Vector would be selected if the Commercial Option for such Disease Indication were exercised, and (b) the Third Party will be granted commercial rights upon exercise of a Commercial Option for such Disease Indication. For the avoidance of doubt, a Third Party Collaborator will not include a Third Party who is granted the right to conduct research and development activities independent of Licensee or unrelated to the exercise of a Commercial Option.

1.33 "Valid Claim" means (a) a claim of an issued and unexpired patent (including any patent claim the term of which is extended by any extension, supplementary protection certificate, patent term restoration, or the like) included within the Licensed Patents or (b) a claim of a pending patent application included within the Licensed Patents that has not been pending for more than 15 years from the earliest filing date to which such claim or the applicable patent application is entitled to claim priority, in each case under clauses (a) and (b) which has not lapsed, been abandoned, been held revoked, or been deemed unenforceable or invalid by a non-appealable decision or an appealable decision from which no appeal was taken within the time allowed for such appeal of a court or other governmental agency of competent jurisdiction.

ARTICLE 2: LICENSE GRANTS

2.1 Research License Grant. Subject to the terms and conditions of this Agreement, including the Retained Rights, during the Research Term, Licensor hereby grants to Licensee a non-exclusive, sublicensable (as provided in Section 2.6 only), non-transferable (except as provided in Section 10.2), worldwide license under the Licensed Research Patents to make, have made, and use any and all AAV Materials in the Research Field (including, for the avoidance of doubt, the right to conduct research and pre-clinical development) solely for purposes of identifying and selecting Specified Vector(s) for use in the Commercial Field upon exercise of a Commercial Option. For the avoidance of doubt, the foregoing license in this Section 2.1 does not include the right to sell, offer for sale, or import any AAV Materials.

2.2 Research License Extension Option. Licensee may extend the Research Term with respect to any or all of the Disease Indications with respect to which the Commercial Option has not been exercised pursuant to Section 2.3 prior to the [***] of the Effective Date by providing written notice to Licensor of such extension and simultaneously paying Licensor a fee of $[***], which notice and payment must be received by Licensor at least [***] prior to the [***]of the Effective Date. If Licensee does not extend the Research Term under this Section 2.2, the Research Term with respect to any or all of the Disease Indications with respect to which the Commercial Option has not been exercised pursuant to Section 2.3 or otherwise terminated by Licensee pursuant to Section 6.3 prior to the [***] of the Effective Date will expire on the [***] of the Effective Date.

2.3 Commercial License Option. Subject to the terms and conditions of this Agreement, Licensor hereby grants to Licensee the option, exercisable at Licensee's sole discretion, to obtain a non-exclusive worldwide license with respect to each of the Disease Indications and a single Specified Vector for such Disease Indication (each such right with respect to a particular Disease Indication, a "Commercial Option") in accordance with the following provisions:

2.3.1 Method of Exercise. To exercise the Commercial Option for a particular Disease Indication, Licensee must provide written notice to Licensor prior to the end of the applicable Research Term, which written notice must specify the Disease Indication(s) and Specified Vector (as further described in Section 2.3.2) with respect to which Licensee desires to exercise its Commercial Option. For each of the Secondary Disease Indications, such written notice must be accompanied by a wire transfer of the commercial option fee set forth in Section 3.2 for such Secondary Disease Indication.

2.3.2 Specified Vector. For purposes of selecting a Specified Vector for use with a Disease Indication, the Specified Vector must be a recombinant adeno-associated virus serotype vector with a specified sequence. Licensee's notice of the specified sequence will provide Licensor with a published source that refers to the sequence (which may include a reference to the Licensed Research Patents), if there is a public source. The sequence of the Specified Vector will be provided to Licensor in a written format setting forth the entire DNA sequence and amino acid sequence in Vector NTI format (from Life Technologies) (or such other format, as the Parties agree) that will enable Licensor to analyze the sequence through the Vector NTI electronic sequence editing program. Licensee may not select AAVrh10 as the Specified Vector for the treatment or prevention of Friedreich's Ataxia (Systemic). Upon Licensor's receipt of the notice and, if applicable, fee described in Section 2.3.1, this Agreement will be amended to add a new Exhibit C (or amend a then-existing Exhibit C) prepared by Licensor setting forth the Specified Vector for each Disease Indication with respect to which a Commercial Option is exercised.

2.3.3 Licensed Commercial Patents. Within [***] after Licensor's receipt of the notice and, if applicable, fee described in Section 2.3.1, Licensor will prepare a new Exhibit D setting forth the applicable Licensed Commercial Patents that apply to the Specified Vector and applicable Disease Indication, which Licensed Commercial Patents will be taken solely from the Licensed Research Patents. Upon Licensee's acceptance of the new Exhibit D (which acceptance will not be unreasonably withheld, conditioned, or delayed), this Agreement will be amended to add such new exhibit. If different Specified Vectors are specified for use in connection with different Disease Indications, then Licensor may create a separate exhibit (labeled Exhibit D-1 through D-4, as necessary) for each Specified Vector. Until this Agreement is amended to include the new Exhibit D, Exhibit A will continue to form the basis for determining the scope of the applicable Licensed Commercial Patents.

2.3.4 License Grant Upon Exercise. If Licensee exercises the Commercial Option for a particular Disease Indication, effective upon both (a) Licensor's receipt of the notice and (b) in the case of a Secondary Disease Indication, the fee described in Section 2.3.1 for such Secondary Disease Indication (the date on which the notice and the fee (if applicable) are received shall be deemed to be the "Grant Date" for such Disease Indication), subject to the terms and conditions of this Agreement, including the Retained Rights, Licensor shall grant, and hereby grants, to Licensee a non-exclusive, sublicensable (as provided in Section 2.6 only), non-transferable (except as provided in Section 10.2), royalty-bearing, worldwide license under the applicable Licensed Commercial Patents to make, have made, use, import, sell, and offer for sale Licensed Products using the Specified Vector solely in the Commercial Field for such Disease Indication, including, for the avoidance of doubt, the right to conduct research and development.

2.3.5 Disease Indications. For the avoidance of doubt, the foregoing license granted pursuant to Section 2.3.4 will be deemed granted on the Grant Date on a Disease Indication-by-Disease Indication basis, solely with respect to the Commercial Field associated with the Disease Indication for which the Commercial Option was exercised under this Section 2.3 and solely with respect to Licensed Products using the Specified Vector selected for the particular Disease Indication. The Parties acknowledge that there may be different Grant Dates for each Disease Indication, depending on when and if Licensee exercises the Commercial Option for a particular Disease Indication. As set forth above, Licensee, at its sole discretion, may exercise the

Commercial Option with respect to any or all of the four Disease Indications. If Licensee exercises the Commercial Option with respect to only some of the Disease Indications but not all, the Commercial Option will terminate with respect to any unexercised Disease Indications and the license granted under Section 2.1 will also terminate, in each case, at the end of the Research Term, and Licensee will have no further rights under this Agreement with respect to such unexercised Disease Indications.

2.4 Retained Rights. Except for the rights and licenses specified in Sections 2.1 and, if applicable, 2.3.4, no license or other rights are granted to Licensee under any intellectual property of Licensor, whether by implication, estoppel, or otherwise and whether such intellectual property is subordinate, dominant, or

otherwise useful for the practice of the Licensed Patents. Notwithstanding anything to the contrary in this Agreement, Licensor may use and permit others to use the Licensed Patents for any research, development, commercial, or other purposes inside or outside of the Commercial Field or the Research Field. Without limiting the foregoing, and notwithstanding anything in this Agreement to the contrary, Licensee acknowledges and agrees to the following rights retained by Licensor and the ReGenX Licensors (individually and collectively, the "Retained Rights"), whether inside or outside the Commercial Field or Research Field:

2.4.1 The rights and licenses granted in Sections 2.1 and, if applicable, 2.3.4 shall not include any right (and Licensor and the ReGenX Licensors retain the exclusive (even as to Licensee), fully sublicensable right) under the Licensed Patents to make, have made, use, sell, offer to sell, and import Domain Antibodies that are expressed by an adeno-associated vector, including any Specified Vector.

2.4.2 Licensor and the ReGenX Licensors retain the following rights with respect to the Licensed Patents:

(a) A non-exclusive, sublicensable right under the Licensed Patents to make, have made, use, sell, offer to sell, and import products that deliver RNA interference and antisense drugs using an adeno-associated vector, including any Specified Vector; and

(b) A non-exclusive right for the ReGenX Licensors (which right is sublicensable by such licensors) to use the Licensed Patents for non-commercial research purposes and to use the Licensed Patents for such licensors' discovery research efforts with non-profit organizations and the ReGenX Licensors' collaborators.

2.4.3 The rights and licenses granted in Sections 2.1 and, if applicable, 2.3.4 shall not include any right (and Licensor retains the exclusive (even as to Licensee), fully sublicensable right) under the Licensed Patents:

(a) to conduct commercial reagent and services businesses, which includes the right to make, have made, use, sell, offer to sell, and import research reagents, including any viral vector construct; provided that for clarity, such exclusive rights retained by Licensor shall not include the right to

conduct clinical trials in humans in the Commercial Field, though Licensor retains the non-exclusive right to do so; or

(b) to use the Licensed Patents to provide services to any Third Parties; provided that Licensee's license under Section 2.3.4, if applicable, does include the right to provide the services of the administration of Licensed Products to patients.

2.4.4 Licensor retains the fully sublicensable right under the Licensed Patents to grant non-exclusive research and development licenses to Affiliates and Third Parties.

2.4.5 The Trustees of the University of Pennsylvania may use and permit other non-profit organizations or other non-commercial entities to use the Licensed Patents for educational and research purposes.

2.5 Government Rights. Licensee acknowledges that the United States government retains certain rights in intellectual property funded in whole or part under any contract, grant, or similar agreement with a federal agency. The license grants hereunder are expressly subject to all applicable United States government rights, including any applicable requirement that products that result from such intellectual property and are sold in the United States must be substantially manufactured in the United States.

2.6 Sublicensing.

2.6.1 The research license granted pursuant to Section 2.1 is sublicensable by Licensee (a) to Affiliates of Licensee and (b) to one Third Party Collaborator with respect to each Disease Indication; any other sublicenses to Third Party Collaborators or Third Parties of the research license granted pursuant to Section 2.1 requires Licensor's prior written consent, which consent may not be unreasonably withheld, conditioned, or delayed. The license granted, if applicable, pursuant to Section 2.3.4 is sublicensable by Licensee to any Affiliates or Third Parties. Any sublicense of the rights under this Section 2.6, whether to an Affiliate or Third Party and whether relating to a sublicense of rights under Section 2.1 or 2.3.4, must comply with the provisions of this Section 2.6 (including Section 2.6.2).

2.6.2 The right to sublicense granted to Licensee under this Agreement is subject to the following conditions:

(a) Licensee may grant a sublicense to an Affiliate of Licensee; provided that (i) such sublicense must comply with the terms of this Section 2.6.2 (except to the extent such terms are limited to Third Party Sublicensees), including being granted pursuant to a written agreement and requiring the Sublicensee to comply with the applicable terms and conditions of this Agreement; (ii) Licensee must provide Licensor with written notice of any such sublicense within [***] after entering into a sublicense, which notice will identify the Affiliate, the applicable Disease Indication, and the scope of the rights sublicensed; (iii) such sublicense must only remain in effect for as long as such sublicensee remains an Affiliate of Licensee; and (iv) without limiting Section 2.6.2(f) below, Licensee will be responsible for

any and all obligations of any such Affiliate as if such Affiliate were "Licensee" hereunder. If either of the ReGenX Licensors requires additional information, including a copy of the sublicense agreement, Licensee shall provide such information, including such copy, to Licensor.

(b) Licensee may only grant sublicenses pursuant to a written sublicense agreement with the Sublicensee. Licensee may grant a direct Sublicensee (as defined in Section 1.30(i) only) of the rights under Section 2.3.4 the right to grant further sublicenses [***]. For the avoidance of doubt, any further sublicenses granted by any Sublicensees must comply with the provisions of this Section 2.6 (including Section 2.6.2) to the same extent that Licensee would have to comply if Licensee were granting a sublicense directly to a Third Party (including the obligation of requiring the Sublicensee to comply with the applicable terms and conditions of this Agreement and providing Licensor with a copy of the sublicense). For clarity, Licensee is entitled to grant to a Sublicensee a sublicense with respect to any or all of the Disease Indications.

(c) In each sublicense agreement, (i) the Sublicensee must be required to comply with the terms and conditions of this Agreement to the same extent as Licensee has agreed, except to the extent that such terms and conditions do not relate to the specific rights granted to the Sublicensee pursuant to this Agreement (e.g., obligations related to a Disease Indication that has not been sublicensed); and (ii) if such Sublicensee is a Third Party, such Sublicensee must acknowledge that Licensor is an express third party beneficiary of such terms and conditions under such sublicense agreement.

(d) The official language of any sublicense agreement shall be English.

(e) Within [***] after entering into a sublicense with a Third Party Sublicensee, Licensor must receive a copy of the sublicense written in the English language for Licensor's records and to share with the ReGenX Licensors. The copy of the sublicense may be redacted to exclude confidential information of Licensee or the applicable Sublicensee, but such copy shall not be redacted to the extent that it impairs Licensor's (or the ReGenX Licensors') ability to ensure compliance with this Agreement; provided that, if either of the ReGenX Licensors requires a complete, unredacted copy of the sublicense, Licensee shall provide such complete, unredacted copy.

(f) Licensee's execution of a sublicense agreement will not relieve Licensee of any of its obligations under this Agreement. Licensee is and shall remain [***] to Licensor for all of Licensee's duties and obligations contained in this Agreement and for any act or omission of an Affiliate or Sublicensee that would be a breach of this Agreement if performed or

omitted by Licensee, and Licensee will be deemed to be in breach of this Agreement as a result of such act or omission.

2.7 Improvements.

2.7.1 Licensee hereby grants to Licensor a non-exclusive, worldwide, royalty-free, transferable, sublicensable, irrevocable, perpetual license to use any Licensed Back Improvements (and any intellectual property rights with respect thereto) consummate in scope to the Retained Rights.

2.7.2 Licensee hereby grants to Licensor a non-exclusive, worldwide, royalty-free, transferable, sublicensable, irrevocable, perpetual license to use and practice any Licensed Back Improvements (and any intellectual property rights with respect thereto) for any and all purposes, including the right to research, develop, make, have made, use, offer for sale, and sell products and services; provided that Licensor shall have no right, under the license in this Section 2.7.2, to use or practice the Licensed Back Improvements, on a Disease Indication-by-Disease Indication basis, (i) inside the Research Field during the Research Term for such Disease Indication or (ii) if the Commercial Option for such Disease Indication is exercised, inside the Commercial Field during the term of this Agreement for such Disease Indication.

2.7.3 For purposes of this Agreement, but subject to Sections 2.7.5 and 2.7.6, "Licensed Back Improvements" means (a) with respect to Section 2.7.1, any patentable modifications or improvements developed, during the term of this Agreement, by Licensee, any Affiliates, or any Sublicensees to any vector that is the subject of a claim within the Licensed Patents, and (b) with respect to Section 2.7.2, any patentable modifications or improvements developed, during the term of this Agreement, by Licensee, any Affiliates, or any Sublicensees to any vector that is the subject of a claim as of the Effective Date within the Licensed Patents.

2.7.4 Licensee agrees to provide prompt notice to Licensor upon the filing of any patent application covering any Licensed Back Improvement, together with a reasonably detailed description of or access to such Licensed Back Improvement to permit the practice of any such Licensed Back Improvement in accordance with the rights granted hereunder.

2.7.5 With respect to any patentable modifications or improvements developed by any Third Party Sublicensee, the definition of "Licensed Back Improvement" under Section 2.7.3 will only include patentable modifications or improvements that are (a) developed by such Third Party Sublicensee during the term of the applicable sublicense granted to such Third Party Sublicensee; and (b) developed by such Third Party Sublicensee (i) to any vector if developed during the Research Term for the particular Disease Indication(s) sublicensed to such Third Party Sublicensee or (ii) to the Specified Vector(s) for the particular Disease Indication(s) sublicensed to such Third Party Sublicensee if developed following the Grant Date for such Disease Indication(s).

2.7.6 Notwithstanding Section 2.7.3, if Licensee undergoes a Change of Control pursuant to which a Third Party acquirer becomes an Affiliate of Licensee hereunder, patentable modifications and improvements that were developed by such acquirer and such acquirer's Affiliates (excluding Licensee and Licensee's Affiliates prior to such Change of Control) prior to

such Change of Control will not become "Licensed Back Improvements" hereunder solely because of such Change of Control transaction, but thereafter the provisions of Section 2.7.3 will apply to patentable modifications or improvements of such acquirer and its Affiliates (if also Affiliates of Licensee) developed after such Change of Control.

ARTICLE 3: CONSIDERATION

3.1 Initial Fee. In consideration of the rights and licenses granted to Licensee under this Agreement, Licensee shall pay Licensor an initial fee of $500,000 within [***] after the Effective Date.

3.2 Commercial Option Fee. If Licensee elects to exercise the Commercial Option granted to Licensee under Section 2.3 with respect to any Secondary Disease Indication, Licensee shall pay Licensor a fee of $[***] for the first Secondary Disease Indication and $[***] for each of the second and third Secondary Disease Indications. For clarity, no such fee will be required with respect to Friedreich's Ataxia (CNS).

3.3 Annual Maintenance Fee. In consideration of the rights and licenses granted to Licensee under this Agreement, Licensee shall pay Licensor on-going annual maintenance fees on each anniversary of the Effective Date. Licensor will invoice Licensee for the amount of such maintenance fee, and the invoiced amount will be due and payable by Licensee on the later of (i) 30 days after receipt of the invoice and (ii) the applicable anniversary of the Effective Date. The annual maintenance fees will equal (a) on each anniversary prior to Licensee exercising the Commercial Option with respect to any Disease Indication, $[***], and (b) on each anniversary after Licensee has exercised the Commercial Option with respect to any Disease Indication, $[***] for each Disease Indication with respect to which the Commercial Option has been exercised as of such anniversary, up to a maximum under this clause (b) of $120,000 for all four Disease Indications. If the royalty obligation with respect to any Disease Indication has expired or such Disease Indication has otherwise been terminated, the amount due pursuant to this Section 3.3 will be decreased by $[***] for each Disease Indication with respect to which the royalty obligation has expired or such Disease Indication has otherwise been terminated.

3.4 Milestone Fees. If Licensee exercises the Commercial Option granted to Licensee under Section 2.3 with respect to any Disease Indication, in consideration of the rights and licenses granted to Licensee under this Agreement, Licensee shall pay Licensor the following milestone payments on a per-Disease Indication basis for the first Licensed Product for such Disease Indication to achieve such milestone event:

Milestone		Milestone Payment
1. First treatment of human subject in a clinical trial (*i.e.*, first patient, first dose)	$	[***]
2. First treatment in Phase 3 Clinical Trial (*i.e.*, first patient, first dose)	$	[***]
3. NDA submission in the United States	$	[***]
4. NDA submission in the European Union or the rest of the world (excluding the United States)	$	[***]
5. NDA approval in the United States	$	[***]
6. NDA approval in the European Union or the rest of the world (excluding the United States)	$	[***]
Total (per Disease Indication):	$	5,000,000

For clarity, the milestone payments set forth in this Section 3.4 are payable [***] with respect to each Disease Indication within the Commercial Field with respect to the first Licensed Product for such Disease Indication that achieves the milestone event, [***]. To the extent that either of the two development milestones in this Section 3.4 (*i.e.*, first treatment of human subject in a clinical trial or first treatment in Phase 3 Clinical Trial) has not been paid at the time of achievement of either NDA submission milestone, then, upon the achievement of either of such NDA submission milestones, the preceding unpaid development milestone payments shall be made in addition to the payment corresponding to the NDA submission milestone that has been achieved.

3.5 Royalties. If Licensee exercises the Commercial Option granted to Licensee under Section 2.3 with respect to any Disease Indication, in consideration of the rights and licenses granted to Licensee under this Agreement, Licensee shall pay to Licensor the following royalties based upon the annual Net Sales worldwide of all Licensed Products for all Disease Indications in the Commercial Field in a given calendar year, subject to the reductions in royalty rates set forth in Section 3.5.1:

Cumulative Annual Net Sales of all Licensed Products for all Disease Indications in the Commercial Field Worldwide	Royalty Percentage
Portion of Net Sales less than $300,000,000	[***]%
Portion of Net Sales between (and including)	[***]%
$300,000,000 through (and including) $600,000,0000 Portion of Net Sales greater than $600,000,000	[***]%

3.5.1 Third Party Royalties Stacking Provision. If Licensee must obtain a license from a Third Party to avoid infringement of such Third Party's rights in order to manufacture, use, or commercialize a given Licensed Product and if the royalties required to be paid to such Third Party for such license, together with those royalties payable to Licensor, in the aggregate, exceed [***] of Net Sales for any Licensed Product, then the royalty owed to Licensor for that Licensed Product will be reduced by an amount calculated as follows:

STACKING ROYALTY CALCULATIONS

R = (C * (A / (A+B)))

Where
R = Reduction of Licensor royalty,
A = Unreduced Licensor royalty,
B = sum of all Third Party royalties,
C = increment of projected total royalty above [***]%.

Example Calculation:

assume: i) all Third Party royalties = [***]%
ii) unreduced Licensor royalty = [***]%
iii) projected total royalty = [***]%

R = ([***] - [***]) * ([***] / ([***] + [***]))
R = ([***] * [***])
R = [***]
Licensor Stacked Royalty = [***] — [***]= [***]%

Notwithstanding the foregoing, Licensee will pay to Licensor no less than [***]% of the royalties that Licensee would otherwise pay to Licensor with respect to Net Sales of Licensee if there were no royalties due to Third Parties.

3.5.2 Royalty Payment Period. Licensee's obligation hereunder for payment of a royalty under this Section 3.5 on the Net Sales of Licensed Products in a given country will expire on a Licensed Product-by-Licensed Product and country-by-country basis [***].

3.5.3 No Multiple Royalties. If the manufacture, use, sale, offer for sale, or import of any Licensed Product infringes or is covered by more than one of the Licensed Commercial Patents, multiple royalties shall not be due.

3.6 Sublicense Fees.

3.6.1 In further consideration of the rights and licenses granted to Licensee under this Agreement, Licensee will pay Licensor [***]% of any sublicense fees (including upfront payments and milestone payments) received by Licensee or its Affiliates for the Licensed Commercial Patents from any Third Party Sublicensee or from any Third Party granted any option to obtain a sublicense.

3.6.2 With respect to the obligations under this Section 3.6, Licensee shall not be required to submit any amounts received from a Third Party for the following:

(a) Reimbursement for research, development, and/or manufacturing activities performed by Licensee or its Affiliates corresponding directly to the development of Licensed Products pursuant to a specific agreement;

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT UNDER RULE 406 PROMULGATED UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

(b) Consideration received for the purchase of an equity interest in Licensee or its Affiliates at fair market value or in the form of loans at commercially reasonable rates of interest; and

(c) Any and all amounts paid to Licensee or its Affiliates by a Third Party Sublicensee as royalties on sales of Licensed Product sold by such Sublicensee under a sublicense agreement.

3.6.3 If Licensee or its Affiliate receives sublicense fees from Third Party Sublicensees or from any Third Party granted any option to obtain a sublicense under this Agreement in the form of non-cash consideration, then, at Licensor's option, Licensee shall pay Licensor payments as required by this Section 3.6 (a) in the form of the non-cash consideration received by Licensee or its Affiliates or (b) a cash payment determined based on the fair market value of such non-cash consideration. If Licensee or its Affiliate enters into any sublicense with a Third Party Sublicensee that is not an arm's length transaction, fees due under this Section 3.6 will be calculated based on the fair market value of such transaction, at the time of the transaction, assuming an arm's length transaction made in the ordinary course of business, as determined jointly by Licensor and Licensee based on transactions of a similar type and standard industry practice, if any.

3.6.4 To the extent Licensee receives payment from a Third Party relating to one or more of the milestone events set forth in the table in Section 3.4, then the amount of the payment made to Licensor under such Section 3.4 with respect to such milestone event shall not be deemed sublicense fees under this Section 3.6; instead, the amounts due under this Section 3.6 shall be calculated by applying the sublicense fee rate set forth in Section 3.6.1 above to the sublicense fees received by Licensee from such Third Party after deducting the amount of the payment under Section 3.4.

3.6.5 If a sublicense or option is part of a transaction in which Licensee or its Affiliates also licenses, sublicenses, or grants rights to technology, patent rights, or other intellectual property rights other than Licensed Patents, that portion of the consideration received by Licensee or its Affiliates and subject to this Section 3.6 shall be equitably apportioned between the Licensed Patents and those other rights, and such apportionment shall be reasonable and in accordance with customary standards in the industry. Licensee shall promptly deliver to Licensor a written report setting forth such apportionment and shall describe in reasonable

detail the rationale for such allocation, together with a copy of all underlying documents necessary to determinate the basis and accuracy of such allocation. If Licensor disagrees with the determination made by Licensee, Licensor shall so notify Licensee within [***] of receipt of Licensee's report, and the Parties shall meet to discuss and resolve such disagreement in good faith. If the Parties are unable to agree as to such apportionment within [***], then the matter shall be submitted in accordance with the dispute resolution process set forth in Section 10.6.

3.7 Reports and Records.

3.7.1 Licensee must deliver to Licensor within [***] after the end of each Calendar Quarter after the first commercial sale of a Licensed Product a report setting forth the calculation of the royalties due to Licensor for such Calendar Quarter, including:

(a) Number of Licensed Products included within Net Sales, listed by country;

(b) Gross consideration for Net Sales of Licensed Product, including all amounts invoiced, billed, or received;

(c) Qualifying costs to be excluded from the gross consideration, as described in Section 1.19, listed by category of cost;

(d) Net Sales of Licensed Products listed by country;

(e) A detailed accounting of any royalty reductions applied pursuant to Section 3.5.1;

(f) Royalties owed to Licensor, listed by category; and

(g) The computations for any applicable currency conversions.

3.7.2 Licensee shall pay the royalties due under Section 3.5 within [***] following the last day of the Calendar Quarter in which the royalties accrue. Licensee shall send the royalty payments along with the report described in Section 3.7.1.

3.7.3 Within [***] after the occurrence of a milestone event described in Section 3.4, Licensee must deliver to Licensor a report describing the milestone event that occurred, together with a payment of the applicable amount due to Licensor pursuant to Section 3.4.

3.7.4 Within [***] after the receipt of any fees from any Third Party as described in Section 3.6, Licensee must deliver to Licensor a report describing the fees received, together with a payment of the applicable amount due to Licensor pursuant to Section 3.6.

3.7.5 All financial reports under this Section 3.7 will be certified by the chief financial officer of Licensee.

3.7.6 Licensee shall maintain and require its Affiliates and all Sublicensees to maintain, complete and accurate books and records which enable the royalties, fees, and payments payable under this Agreement to be verified. The records must be maintained for [***] after the submission of each report under Article 3. Upon reasonable prior written notice to Licensee, Licensee and its Affiliates and all Sublicensees will provide Licensor and/or the ReGenX Licensors (and their respective accountants) with access to all of the relevant books, records, and related background information required by this Section 3.7.6 to conduct a review or audit of the royalties, fees, and payments payable to Licensor under this Agreement to be verified. Access will be made available: (a) during normal business hours; (b) in a manner reasonably designed to facilitate the auditing party's review or audit without unreasonable disruption to Licensee's business; and (c) no more than once each calendar year during the term of this Agreement and for a period of [***] thereafter. Licensee will promptly pay to Licensor the amount of any underpayment determined by the review or audit, plus accrued interest. If the review or audit determines that Licensee has underpaid any payment by [***]% or more, then Licensee will also

promptly pay the costs and expenses of Licensor and the ReGenX Licensors and their respective accountants in connection with the review or audit.

3.8 Currency, Interest.

3.8.1 All dollar amounts referred to in this Agreement are expressed in United States dollars. All payments to Licensor under this Agreement must be made in United States dollars.

3.8.2 If Licensee receives payment in a currency other than United States dollars for which a royalty or fee or other payment is owed under this Agreement, then (a) the payment will be converted into United States dollars at the conversion rate for the foreign currency as published in the eastern edition of the *Wall Street Journal*, N.Y. edition, as of the last business day of the Calendar Quarter in which the payment was received by Licensee; and (b) the conversion computation will be documented by Licensee in the applicable report delivered to Licensor under Section 3.7.

3.8.3 All amounts that are not paid by Licensee when due will accrue interest from the date due until paid at a rate equal to 1.5% per month (or the maximum allowed by law, if less).

3.9 Taxes and Withholding.

3.9.1 All payments hereunder will be made free and clear of, and without deduction or deferment in respect of, and Licensee shall pay and be responsible for, and shall hold Licensor harmless from and against, any taxes, duties, levies, fees, or charges, including sales, use, transfer, excise, import, and value added taxes (including any interest, penalties, or additional amounts imposed with respect thereto) but excluding withholding taxes to the extent provided in Section 3.9.2. At the request of Licensee, Licensor will give Licensee such reasonable assistance, which will include the provision of documentation as may be required by the relevant tax authority, to enable Licensee to pay and report and, as applicable, claim exemption from or reduction of, such tax, duty, levy, fee, or charge.

3.9.2 If any payment made by Licensee hereunder becomes subject to withholding taxes with respect to Licensor's gross or net income under the laws of any jurisdiction, Licensee will deduct and withhold the amount of such taxes for the account of Licensor to the extent required by law and will pay the amounts of such taxes to the proper governmental authority in a timely manner and promptly transmit to Licensor appropriate proof of payment of such withholding taxes. At the request of Licensor, Licensee will give Licensor such reasonable assistance, which will include the provision of appropriate certificates of such deductions made together with other supporting documentation as may be required by the relevant tax authority, to enable Licensor to claim exemption from or reduction of, or otherwise obtain repayment of, such withholding taxes, and will upon request provide such additional documentation from time to time as is reasonably required to confirm the payment of withholding tax.

ARTICLE 4: DILIGENCE

4.1 Diligence Obligations. If Licensee elects to exercise the Commercial Option granted to Licensee under Section 2.3 with respect to any Disease Indication, Licensee will use commercially reasonable efforts to develop, commercialize, market, promote, and sell at least

one Licensed Product for each Disease Indication in the Commercial Field. Commercially reasonable efforts means efforts equivalent to those utilized by [***].

4.2 Reporting. Within [***] after the Grant Date and within [***] of each December 1 thereafter, Licensee shall provide Licensor with written progress reports, setting forth in such detail as Licensor may reasonably request, the progress of the development, evaluation, testing, and commercialization of each Licensed Product. Licensee will also notify Licensor within [***] of the first commercial sale by Licensee, its Affiliates, or any Sublicensees of each Licensed Product. Such a report ("Development Progress Report"), setting forth the current stage of development of Licensed Products, shall include:

4.2.1 Date of Development Progress Report and time covered by such report;

4.2.2 Major activities and accomplishments completed by Licensee, its Affiliates, and any Sublicensees relating directly to the Licensed Product since the last Development Progress Report;

4.2.3 Significant research and development projects relating directly to the Licensed Product currently being performed by Licensee, its Affiliates, and any Sublicensees and projected dates of completion;

4.2.4 A development plan covering the next two years at least, which will include future development activities to be undertaken by Licensee, its Affiliates, or any Sublicensees during the next reporting period relating directly to the Licensed Product, Licensee's strategy to bring the Licensed Product to commercialization, and projected timeline for completing the necessary tasks to accomplish the goals of the strategy;

4.2.5 Projected total development remaining before product launch of each Licensed Product; and

4.2.6 Summary of significant development efforts using the Licensed Patents being performed by Third Parties, including the nature of the relationship between Licensee and such Third Parties.

4.3 Confidential Information. The Parties agree that Development Progress Reports shall be deemed Licensee's Confidential Information; provided that Licensor may share a copy of such reports with the ReGenX Licensors.

4.4 Improvements. Simultaneously with the Development Progress Report, Licensee shall deliver a detailed description of any Licensed Back Improvements, if not previously provided pursuant to Section 2.7.4.

ARTICLE 5: CONFIDENTIALITY

5.1 Treatment of Confidential Information. Each Party, as a receiving party (a "Receiving Party"), agrees that it will (a) treat Confidential Information of the other Party (the "Disclosing Party") as strictly confidential; (b) not disclose such Confidential Information to Third Parties without the prior written consent of the Disclosing Party, except as may be permitted in this

Agreement; provided that any disclosure permitted hereunder be under confidentiality agreements with provisions substantially similar to those contained in this Agreement; and (c) not use such Confidential Information for purposes other than those authorized expressly in this Agreement. The Receiving Party agrees to

ensure that its employees who have access to Confidential Information are obligated in writing to abide by confidentiality obligations substantially similar to those contained under this Agreement.

5.2 Public Announcements.

5.2.1 The Parties agree they will release a joint press release in the form attached hereto as Exhibit B. Except as provided in Section 5.2.2, any other press releases by either Party with respect to the other Party or any other public disclosures concerning the existence of or terms of this Agreement shall be subject to review and approval by the other Party. Once the joint press release or any other written statement is approved for disclosure by both Parties, either Party may make subsequent public disclosure of the contents of such statement without the further approval of the other Party.

5.2.2 Notwithstanding Section 5.2.1, Licensor has the right to publish (through press releases, scientific journals, or otherwise) and refer to any clinical, regulatory, or research results related to Licensee's Licensed Product or Specified Vector program that have been publicly disclosed by Licensee, including referring to Licensee by name as a licensee of Licensor, which publication or referral by Licensor shall not require the prior consent of Licensee.

5.3 Authorized Disclosure. Notwithstanding the provisions of Section 5.1 or 5.2, either Party may disclose Confidential Information or make such a disclosure of the existence of and/or terms of this Agreement to any [***]; provided that, in each case, such recipient of Confidential Information is obligated to keep such information confidential on terms substantially similar to those set forth in this Agreement. Furthermore, Licensee agrees that Licensor may share a copy of this Agreement, reports and notices provided by Licensee to Licensor pursuant to the terms of this Agreement, and copies of sublicense agreements provided to Licensor hereunder with the ReGenX Licensors. In the event that the Receiving Party receives service of legal process that purports to compel disclosure of the Disclosing Party's Confidential Information or becomes obligated by law to disclose the Confidential Information of the Disclosing Party or the existence of or terms of this Agreement to any governmental authority, the Receiving Party shall promptly notify the Disclosing Party, so that the Disclosing Party may seek an appropriate protective order or other remedy with respect to narrowing the scope of such requirement and/or waive compliance by the Receiving Party with the provisions of this Agreement. The Receiving Party will provide the Disclosing Party, at the Disclosing Party's expense, with reasonable assistance in obtaining such protective order or other remedy. If, in the absence of such protective order or other remedy, the Receiving Party is nonetheless required by law to disclose the existence of or terms of this Agreement or other Confidential Information of the Disclosing Party, the Receiving Party may disclose such Confidential Information without liability hereunder; provided that the Receiving Party shall furnish only such portion of the Confidential Information that is legally required to be disclosed and only to the extent required by law.

5.4 Term of Confidentiality. The obligations of this Article 5 shall continue for a period of [***] following the expiration or termination of this Agreement.

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT UNDER RULE 406 PROMULGATED UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

ARTICLE 6: TERM AND TERMINATION

6.1 Term of Agreement. This Agreement, unless sooner terminated as provided in this Agreement, expires upon the expiration, lapse, abandonment, or invalidation of the last Valid Claim of the Licensed Commercial Patents to expire, lapse, or become abandoned or unenforceable in all the countries of the world.

6.2 Termination for Failure to Exercise Option. This Agreement will terminate automatically at the end of the Research Term if Licensee does not exercise the Commercial Option with respect to any Disease Indication in accordance with Section 2.3. If Licensee does not exercise the Commercial Option with respect to all Disease Indications, this Agreement will terminate with respect to all unexercised Disease Indications at the end of the Research Term.

6.3 Licensee's Right to Terminate. Licensee may, upon [***] prior written notice to Licensor, terminate this Agreement for any reason, with or without cause. In exercising such termination right, Licensee may terminate the Agreement in its entirety or, if desired, Licensee may specify in the written notice that this Agreement is terminating only with respect to one or more of the Disease Indications within the Research Field or Commercial Field, as applicable.

6.4 Termination for Breach.

6.4.1 Licensor may terminate this Agreement, if Licensee is late in paying to Licensor royalties, fees, or any other monies due under this Agreement, and Licensee does not pay Licensor in full within [***] upon written demand from Licensor, which termination shall be effective immediately upon the expiration of such [***] cure period.

6.4.2 Either Party may terminate this Agreement, if the other Party materially breaches this Agreement and does not cure such material breach within [***] after written notice of the breach, which termination shall be effective immediately upon the expiration of such [***] cure period.

6.5 Termination for Insolvency.

6.5.1 Licensor may terminate this Agreement, effective immediately upon written notice to Licensee, if Licensee, any of its Affiliates, or any Sublicensees experiences any Trigger Event.

6.5.2 For purposes of this Section 6.5, "Trigger Event" means any of the following: (a) if Licensee, any Affiliate, or any Sublicensee, as applicable, (i) becomes insolvent, becomes bankrupt, or generally fails to pay its debts as such debts become due, (ii) is adjudicated insolvent or bankrupt, (iii) admits in writing its inability to pay its debts, (iv) suffers the appointment of a custodian, receiver, or trustee for it or its property and, if appointed without its consent, is not discharged within [***], (v) makes an assignment for the benefit of creditors, or (vi) suffers proceedings being instituted against it under any law related to bankruptcy, insolvency, liquidation, or the reorganization, readjustment, or release of debtors and, if contested by it, not dismissed or stayed within [***]; (b) the institution or commencement by Licensee, any Affiliate, or any Sublicensee, as applicable, of any proceeding under any law related to bankruptcy, insolvency, liquidation, or the reorganization, readjustment, or release of

debtors; (c) the entering of any order for relief relating to any of the proceedings described in Section 6.5.2(a) or (b) above; (d) the calling by Licensee, any Affiliate, or any Sublicensee, as applicable, of a meeting of its creditors with a view to arranging a composition or adjustment of its debts; or (e) the act or failure to act by Licensee, any Affiliate, or any Sublicensee, as applicable, indicating its consent to, approval of, or acquiescence in any of the proceedings described in Section 6.5.2(b) through (d) above.

6.6 Patent Challenge.

6.6.1 Licensor may terminate this Agreement, effective immediately upon written notice to Licensee, upon the commencement by Licensee or any of its Affiliates of a Patent Challenge. Licensee shall include in each sublicense agreement entered into with a Sublicensee a right of Licensee to terminate such sublicense agreement if such Sublicensee commences a Patent Challenge; and Licensee shall terminate the sublicense agreement, effective immediately upon written notice to the Sublicensee, if the Sublicensee commences a Patent Challenge. In addition, if the Sublicensee's commencement of a Patent Challenge gives The Trustees of the University of Pennsylvania (or any successor thereto under the Penn Agreement) a right of termination under the Penn Agreement, then, upon receipt of notice from the Trustees of the University of Pennsylvania, Licensor may terminate this Agreement, effective immediately upon written notice to Licensee, if any Sublicensee commences a Patent Challenge. If Licensor obtains actual knowledge of a Patent Challenge commenced by a Sublicensee, Licensor shall use commercially reasonable efforts to provide Licensee with written notice of such Patent Challenge; provided that Licensor's failure to provide such notice will not affect Licensee's obligations hereunder.

6.6.2 For purposes of this Section 6.6, "Patent Challenge" means any action against Licensor, The Trustees of the University of Pennsylvania, or the ReGenX Licensors, including an action for declaratory judgment, to declare or render invalid or unenforceable the Licensed Patents, or any claim thereof.

6.7 Effects of Termination. The effect of termination pursuant to Section 6.2, by Licensee pursuant to Section 6.3, by either Party, as applicable, under Section 6.4, or by Licensor pursuant to Section 6.5 or 6.6 shall be as follows:

6.7.1 The licenses granted by Licensor hereunder shall terminate, and Licensee, its Affiliates, and (unless the sublicense agreement is assigned pursuant to Section 6.7.2) all Sublicensees shall cease to make, have made, use, import, sell, and offer for sale all AAV Materials or Licensed Products and shall cease to otherwise practice the Licensed Patents; provided that Licensee, its Affiliates, and Sublicensees shall have the right to continue to sell their existing inventories of Licensed Products for a period not to exceed [***] after the effective date of such termination;

6.7.2 Licensee shall assign to Licensor any or all sublicenses granted to Third Parties to the extent of the rights licensed to Licensee hereunder and sublicensed to the Sublicensee; provided that (i) prior to such assignment, Licensee shall advise Licensor whether such Sublicensee is then in full compliance with all terms and conditions of its sublicense and continues to perform thereunder, and, if such Sublicensee is not in full compliance or is not

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continuing to perform, Licensor may elect not to have such sublicense assigned, in which event such sublicense shall terminate; (ii) such Sublicensee must agree in writing to assume Licensee's terms, conditions, and obligations to Licensor set forth in this Agreement, including all payment obligations; and (iii) following such assignment, Licensor shall not be liable to such Sublicensee with respect to any obligations of Licensee to the Sublicensee that are not consistent with, or not required by, Licensor's obligations to Licensee under this Agreement; and all sublicenses not assigned to Licensor as provided in this Section 6.7.2 shall terminate;

6.7.3 If termination is by Licensee pursuant to Section 6.3 or by Licensor pursuant to Section 6.4, 6.5, or 6.6, then, effective as of such termination of this Agreement, Licensee shall grant, and hereby grants, to Licensor a non-exclusive, perpetual, irrevocable, worldwide, royalty-free, transferable, sublicensable license under any patentable modifications or improvements (and any intellectual property rights with respect thereto) developed, during the term of this Agreement, by Licensee, any Affiliates, or any Sublicensees to any vector that is the subject of a claim within any of the Licensed Patents, for use by Licensor (and its sublicensees) for the research, development, and commercialization of products in any therapeutic indication; provided that the categorization of patentable modifications or improvements that are subject to this Section 6.7.3 will be subject to the same exclusions applicable to "Licensed Back Improvements" under Sections 2.7.5 and 2.7.6.

6.7.4 Licensee shall pay all monies then-owed to Licensor under this Agreement;

6.7.5 Each Receiving Party shall, at the other Party's request, return all Confidential Information of the Disclosing Party. Notwithstanding the foregoing, one copy may be kept by either Party for a record of that Party's obligations; and

6.7.6 If termination is only with respect to a particular Disease Indication within the Research Field or the Commercial Field, but not all Disease Indications, then the provisions of this Section 6.7 shall only apply with respect to the terminated Disease Indications, and this Agreement shall continue as provided herein with respect to the non-terminated Disease Indications.

6.8 Survival. Licensee's obligation to pay all monies due and owed to Licensor under this Agreement which have matured as of the effective date of termination or expiration shall survive the termination or expiration of this Agreement. In addition, the provisions of Article 1 (Definitions), Section 2.4, (Retained Rights), Section 2.5 (Government Rights), Section 2.7 (Improvements), Section 3.1 (Initial Fee), Article 3 (Consideration) (with respect to any final reports or to the extent any amounts are due but unpaid), Section 3.7 (Reports and Records), Article 5 (Confidentiality), Section 6.7 (Effects of Termination), Section 6.8 (Survival), Section 8.3 (Disclaimer of Warranties, Damages), Section 8.4 (Indemnification), Section 8.5 (Insurance), Article 9 (Use of Name), and Article 10 (Additional Provisions) shall survive such termination or expiration of this Agreement in accordance with their respective terms.

ARTICLE 7: PATENT MAINTENANCE; PATENT INFRINGEMENT

7.1 Prosecution of Licensed Patents. As between Licensor and Licensee, but subject to any obligations of Licensor to the ReGenX Licensors, the Parties agree as follows:

7.1.1 Licensor shall have the sole right, but not the obligation, to Prosecute patent applications and issued patents within Licensed Patents, in Licensor's sole discretion.

7.1.2 Nothing in this Agreement obligates Licensor to continue to Prosecute any patent applications or issued patents, and Licensee acknowledges that Licensor shall have no obligation to undertake any inter-party proceedings, such as oppositions or interferences, or to undertake any re-examination or re-issue proceedings, in either case, with respect to the Licensed Patents.

7.2 Infringement Actions Against Third Parties.

7.2.1 Licensee is responsible for notifying Licensor promptly of any infringement of Licensed Patents within the Disease Indications (other than Retained Rights) that may come to Licensee's attention.

7.2.2 As between Licensor and Licensee, but subject to any obligations of Licensor to the ReGenX Licensors, Licensor shall have the sole right, but not the obligation, to prosecute any such infringement [***] recovered in connection therewith. In any action to enforce any of the Licensed Patents, Licensee, at the request and expense of Licensor, shall cooperate to the fullest extent reasonably possible. Nothing in this Agreement obligates Licensor to bring or prosecute lawsuits against Third Parties for infringement of any Licensed Patents.

7.2.3 Licensee shall have no right to undertake prosecution of any such infringement.

7.3 Defense of Infringement Claims. In the event Licensee or Licensor becomes aware that Licensee's or any of its Affiliates' or any Sublicensees' practice of the Licensed Patents is the subject of a claim for patent infringement by a Third Party, that Party shall promptly notify the other, and the Parties shall consider the claim and the most appropriate action to take. Licensee shall cause each of its Affiliates and each Sublicensee to notify Licensee promptly in the event such entity becomes aware that its practice of the Licensed Patents is the subject of a claim of patent infringement by another. To the extent Licensor takes any action, Licensor (or the ReGenX Licensors) shall have the right to require Licensee's reasonable cooperation in any such suit, upon written notice to Licensee; and Licensee shall have the obligation to participate upon Licensor's request, in which event, Licensor shall bear the cost of Licensee's participation. Without Licensor's prior written permission, Licensee must not settle or compromise any such suit in a manner that imposes any material obligations or restrictions on Licensor or the ReGenX Licensors or grants any rights to the Licensed Patents other than rights that Licensee has the right to grant under this Agreement.

ARTICLE 8: REPRESENTATIONS AND WARRANTIES; INDEMNIFICATION

8.1 Representations and Warranties by Licensor. Licensor represents and warrants to Licensee as of the Effective Date:

8.1.1 Licensor has the right, power, and authority to enter into this Agreement and to grant to Licensee the licenses specified in this Agreement;

8.1.2 This Agreement when executed shall become the legal, valid, and binding obligation of it, enforceable against it, in accordance with its terms;

8.1.3 There are no actions, suits, proceedings, or arbitrations pending or, to Licensor's knowledge, threatened against Licensor relating to the Licensed Research Patents that would be inconsistent with the rights granted to Licensee under this Agreement;

8.1.4 To Licensor's Knowledge, Licensor has not received any written notice from the ReGenX Licensors informing Licensor that there are any actions, suits, proceedings, or arbitrations pending against the ReGenX Licensors relating to the Licensed Research Patents that would be inconsistent with the rights granted to Licensee under this Agreement;

8.1.5 To Licensor's knowledge, (a) the Licensed Research Patents are solely owned by the Trustees of the University of Pennsylvania, and (b) no Third Party (other than the ReGenX Licensors) has any right, interest, or claim in or to such Licensed Research Patents with respect to the Disease Indications that are inconsistent with those granted to Licensee with respect to the Disease Indications;

8.1.6 To Licensor's knowledge, GSK Agreement and Penn Agreement are in full force and effect;

8.1.7 To Licensor's knowledge, no Third Party is infringing any of the Licensed Research Patents in a manner that is inconsistent with the scope of rights granted to Licensee with respect to the Disease Indications; and

8.1.8 Licensor has not received any written notice from any Third Party patentee alleging infringement of such Third Party's patents by the practice of the Licensed Research Patents with respect to the Disease Indications.

8.2 Representations and Warranties by Licensee. Licensee represents and warrants to Licensor as of the Effective Date that:

8.2.1 Licensee has the right, power, and authority to enter into this Agreement and to grant the licenses granted by it hereunder;

8.2.2 This Agreement when executed shall become the legal, valid, and binding obligation of it, enforceable against it, in accordance with its terms;

8.2.3 Licensee has the ability and the resources, including financial resources, necessary to carry out its obligations under this Agreement; and

8.2.4 There are no actions, suits, proceedings, or arbitrations pending or, to Licensee's knowledge, threatened against Licensee that would impact activities under this Agreement.

8.3 Disclaimer of Warranties, Damages.

8.3.1 EXCEPT AS SET FORTH IN SECTION 8.1, THE LICENSED PATENTS, AAV MATERIALS, LICENSED PRODUCTS, AND ALL RIGHTS LICENSED UNDER THIS AGREEMENT ARE PROVIDED ON AN "AS IS" BASIS, AND LICENSOR MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT THERETO. BY WAY OF EXAMPLE BUT NOT OF LIMITATION, LICENSOR MAKES NO

REPRESENTATIONS OR WARRANTIES, AND HEREBY DISCLAIMS ALL EXPRESS AND IMPLIED REPRESENTATIONS AND WARRANTIES, (i) OF COMMERCIAL UTILITY, ACCURACY, COMPLETENESS, PERFORMANCE, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, VALIDITY OR ENFORCEABILITY OF THE LICENSED PATENTS, AND PROFITABILITY; OR (ii) THAT THE USE OF THE LICENSED PATENTS, AAV MATERIALS, OR LICENSED PRODUCTS WILL NOT INFRINGE ANY PATENT, COPYRIGHT, TRADEMARK, OR OTHER PROPRIETARY RIGHTS OF THIRD PARTIES.

8.3.2 EXCEPT AS SET FORTH HEREIN, NONE OF LICENSOR OR THE REGENX LICENSORS SHALL BE LIABLE TO LICENSEE, LICENSEE'S SUCCESSORS OR ASSIGNS, ANY SUBLICENSEES, OR ANY THIRD PARTY WITH RESPECT TO ANY CLAIM ARISING FROM USE OF THE LICENSED PATENTS, AAV MATERIALS, LICENSED PRODUCTS, AND ANY OR ALL RIGHTS LICENSED UNDER THIS AGREEMENT OR FROM THE DEVELOPMENT, TESTING, MANUFACTURE, USE, OR SALE OF AAV MATERIALS OR LICENSED PRODUCTS

8.3.3 NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY OR ITS SUCCESSORS OR ASSIGNS, ANY SUBLICENSEE, OR THIRD PARTY AND NEITHER OF THE REGENX LICENSORS SHALL BE LIABLE TO LICENSEE, LICENSEE'S SUCCESSORS OR ASSIGNS, ANY SUBLICENSEES, OR ANY THIRD PARTY WITH RESPECT TO ANY CLAIM FOR LOSS OF PROFITS, LOSS OR INTERRUPTION OF BUSINESS, OR FOR INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES OF ANY KIND, INCLUDING ANY ARISING FROM OR RELATING TO ANY BREACH OF THIS AGREEMENT OR THE EXERCISE OF RIGHTS HEREUNDER, REGARDLESS OF ANY NOTICE OF SUCH DAMAGES; PROVIDED THAT NOTHING IN THIS SECTION 8.3.3 IS INTENDED TO LIMIT OR RESTRICT THE INDEMNIFICATION RIGHTS OR OBLIGATIONS OF EITHER PARTY UNDER SECTION 8.4 OR TO LIMIT A PARTY'S LIABILITY FOR BREACHES OF ITS OBLIGATION REGARDING CONFIDENTIALITY UNDER ARTICLE 5.

8.4 Indemnification.

8.4.1 By Licensee. Licensee shall defend, indemnify, and hold harmless Licensor, the ReGenX Licensors, and their respective shareholders, members, officers, directors, trustees, faculty, students, contractors, agents, and employees (individually, a "Licensor Indemnified Party" and, collectively, the "Licensor Indemnified Parties") from and against any and all Third Party liability, loss, damage, action, claim, fee, cost, or expense (including attorneys' fees) (individually, a "Third Party Liability" and, collectively, the "Third Party Liabilities") suffered or incurred by the Licensor Indemnified Parties from claims of such Third Parties that result from or arise out of: (i) [***]; (ii) [***]; and (iii) [***]; provided, however, that Licensee shall not be liable for claims to the extent based on any breach by Licensor of the representations, warranties, or obligations of this Agreement or the gross negligence or intentional misconduct of any of the Licensor Indemnified Parties. Without limiting the foregoing, Licensee must defend, indemnify, and hold harmless the Licensor Indemnified Parties from and against any Third Party Liabilities resulting from:

(a) any [***] or other claim of any kind related to the [***] by a Third Party of a Licensed Product that was [***] by Licensee, its Affiliates, any Sublicensees, their respective assignees, or vendors;

(b) any claim by a Third Party that the [***]; and

(c) [***] conducted by or on behalf of Licensee, its Affiliates, any Sublicensees, their respective assignees, or vendors relating to the Licensed Patents, AAV Materials, or Licensed Products, including any claim by or on [***].

8.4.2 By Licensor. Licensor shall defend, indemnify, and hold harmless Licensee, its shareholders, members, officers, directors, contractors, agents, and employees (individually, a "Licensee Indemnified Party" and, collectively, the "Licensee Indemnified Parties") from and against any and all Third Party Liabilities suffered or incurred by the Licensee Indemnified Parties from claims of such Third Parties to the extent that such claims result from or arise out of the [***]; provided, however, that Licensor shall not be liable for claims to the extent based on any breach by Licensee of the representations, warranties, or obligations of this Agreement or the gross negligence or intentional misconduct of any of the Licensee Indemnified Parties.

8.4.3 Indemnification Procedure. Each Party, as an indemnifying party (an "Indemnifying Party"), shall not be permitted to settle or compromise any claim or action giving rise to Third Party Liabilities in a manner (a) that imposes any restrictions or obligations on any indemnified party (an "Indemnified Party") without the Indemnified Party's prior written consent, (b) if Licensee is the Indemnifying Party, that imposes any restrictions or obligations on the ReGenX Licensors or grants any rights to the Licensed Patents, AAV Materials, or Licensed Products other than those Licensee has the right to grant under this Agreement without Licensor's prior written consent, or (c) if Licensor is the Indemnifying Party, that grants any rights to the Licensed Back Improvements other than those Licensor has the right to grant under this Agreement without Licensee's prior written consent. The Indemnifying Party shall be permitted to control any litigation or potential litigation involving the defense of any claim subject to indemnification pursuant to this Section 8.4, including the selection of counsel, with the reasonable approval of the Indemnified Party. If an Indemnifying Party fails or declines to assume the defense of any such claim or action within [***] after notice thereof, the Indemnified Party may assume the defense of such claim or action at the cost and risk of the Indemnifying Party, and any Third Party Liabilities related thereto shall be conclusively deemed a Third Party Liability of the Indemnifying Party. The indemnification rights of a Indemnified Party contained in this Agreement are in addition to all other rights that such Indemnified Party may have at law or in equity or otherwise. The Indemnifying Party will pay directly all Third Party Liabilities incurred for defense or negotiation of any claim hereunder or will reimburse the Indemnified Party for all documented Third Party Liabilities incident to the defense or negotiation of any such claim within [***] after the Indemnifying Party's receipt of invoices for such fees, expenses, and charges.

8.5 Insurance. Licensee will procure and maintain insurance policies for the following coverages with respect to product liability, personal injury, bodily injury, and property damage arising out of Licensee's (and its Affiliates' and any Sublicensees') performance under this

Agreement: (a) during the term of this Agreement, comprehensive general liability, including broad form and contractual liability, in a minimum amount of $[***] combined single limit per occurrence (or claim) and in the aggregate annually; (b) prior to the commencement of clinical trials involving Licensed Products and thereafter for a period of not less than [***] (or such longer period as Licensee is required by applicable law to continue to monitor the participants in the clinical trial), clinical trials coverage in amounts that are reasonable and customary in the U.S. pharmaceutical industry, subject always to a minimum limit of $[***] combined single limit per occurrence (or claim) and in the aggregate annually; and (c) from prior to the first commercial sale of a Licensed Product until [***] after the last sale of a Licensed Product, product liability coverage, in amounts that are reasonable and customary in the U.S. pharmaceutical industry, subject always to a minimum limit of $[***] combined single limit per occurrence (or claim) and in the aggregate annually. Licensor may review periodically the adequacy of the minimum amounts of insurance for each coverage required by this Section 8.5, and Licensor reserves the right to require Licensee to adjust the limits accordingly. The required minimum amounts of insurance do not constitute a limitation on Licensee's liability or indemnification obligations to the Licensor Indemnified Parties under this Agreement. The policies of insurance required by this Section 8.5 will be issued by an insurance carrier with an A.M. best rating of [***] or better and will name Licensor as an additional insured with respect to Licensee's performance (and its Affiliates' and any Sublicensees') under this Agreement. Licensee will provide Licensor with insurance certificates evidencing the required coverage within [***] after the Effective Date and the commencement of each policy period and any renewal periods. Each certificate will provide that the insurance carrier will notify Licensor in writing at least [***] prior to the cancellation or material change in coverage. Licensee will cause all Sublicensees to comply with the terms of this Section 8.5 to the same extent as Licensee.

ARTICLE 9: USE OF NAME

Licensee, its Affiliates, any Sublicensees, and all of its and their employees and agents must not use Licensor's, the University of Pennsylvania's, or SmithKline Beecham Corporation's name, seal, logo, trademark, or service mark (or any adaptation thereof) or the name, seal, logo, trademark, or service mark (or any adaptation thereof) of any of such entities' representative, school, organization, employee, or student in any way without the prior written consent of Licensor or such entity, as applicable; provided, however that Licensee may acknowledge the existence and general nature of this Agreement, subject to Section 5.3.

ARTICLE 10: ADDITIONAL PROVISIONS

10.1 Relationship. Nothing in this Agreement shall be deemed to establish a relationship of principal and agent between Licensee and Licensor, nor any of their agents or employees for any purpose whatsoever, nor shall this Agreement be construed as creating any other form of legal association or arrangement which would impose liability upon one Party for the act or failure to act of the other Party.

10.2 Assignment. The rights and obligations of Licensee and Licensor hereunder shall inure to the benefit of, and shall be binding upon, their respective permitted successors and assigns. Licensee may not assign this Agreement or any of its rights or obligations under this Agreement

without the prior written consent of Licensor, which consent may not be unreasonably withheld, conditioned, or delayed. Notwithstanding the foregoing, Licensee may assign this Agreement without Licensor's consent, (a) to an Affiliate; provided that such Affiliate will continue to have to perform under Section 4.1 with at least the same level of efforts that Licensee would have been required to exercise; or (b) pursuant to a sale or merger of Licensee or the transfer of substantially all of the assets of Licensee's business to which this Agreement relates (whether by sale, merger, reorganization, consolidation, or otherwise); provided that, as part of any permitted assignment, (i) Licensee provides Licensor with written notice of such assignment at least five business days prior to the effectiveness of such assignment; (ii) Licensee requires any such assignee to agree in writing to be legally bound by this Agreement to the same extent as Licensee and provides Licensor with a copy of such assignee undertaking; and (iii) if such assignment is to an Affiliate, Licensee remains responsible for the performance of this Agreement by such Affiliate. An assignment to an Affiliate will terminate, and all rights assigned will revert to Licensee, if and when such Affiliate ceases to be an Affiliate of Licensee, and Licensee will provide Licensor written notice of such assignment within five business days of such event. In addition, Licensee will provide Licensor with written notice of any Change of Control (for purposes of this Agreement, the term "Change of Control" means the acquisition by a person or

group of "control" of Licensee, as defined in Section 1.3, whether or not the person or group acquiring control would be deemed an "Affiliate" under such Section 1.3) of Licensee at least five business days prior to the effectiveness of such Change of Control. Licensor may assign this Agreement and its rights and obligations without the consent of Licensee. No assignment shall relieve the assigning Party of responsibility for the performance of any accrued obligations which it has prior to such assignment. Any attempted assignment by Licensee in violation of this Section 10.2 shall be null and void and of no legal effect.

10.3 Waiver. A waiver by either Party of a breach of any provision of this Agreement will not constitute a waiver of any subsequent breach of that provision or a waiver of any breach of any other provision of this Agreement.

10.4 Notices. Notices, payments, statements, reports, and other communications under this Agreement shall be in writing and shall be deemed to have been received as of the date received if sent by public courier (*e.g.*, Federal Express), sent by Express Mail, receipt requested, delivered in person, or sent by facsimile (with a copy of such facsimile also sent by one of the other methods of delivery) and addressed as follows:

If for Licensor:

ReGenX Biosciences, LLC
750 17th Street, NW
Suite 1100
Washington, DC 20006
USA
Attn: Chief Executive Officer
Telephone: 202-785-7438
Facsimile: 202-785-7439

with a copy to:

ReGenX Biosciences, LLC
750 17th Street, NW
Suite 1100
Washington, DC 20006
USA
Attn: General Counsel
Telephone: 202-785-7438
Facsimile: 202-785-7439

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT UNDER RULE 406 PROMULGATED UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

If for Licensee:

Voyager Therapeutics, Inc.
75 Sidney Street
Cambridge, MA 02139
Attn: Chief Executive Officer
Telephone: 857-259-5340
Facsimile: 617-621-2971

Either Party may change its official address upon written notice to the other Party.

10.5 Applicable Law. This Agreement shall be construed and governed in accordance with the laws of the State of Delaware, without giving effect to conflict of law provisions that may require the application of the laws of another jurisdiction. Subject to Section 10.6, the Parties hereby submit to the exclusive jurisdiction of and venue in the courts located in the State of Delaware with respect to any and all disputes concerning the subject of this Agreement.

10.6 Dispute Resolution. In the event of any controversy or claim arising out of or relating to this Agreement, the Parties shall first attempt to resolve such controversy or claim through good faith negotiations for a period of not less than [***] following notification of such controversy or claim to the other Party. If such controversy or claim cannot be resolved by means of such negotiations during such period, then such controversy or claim shall be resolved by binding arbitration administered by the American Arbitration Association ("AAA") in accordance with the Commercial Arbitration Rules of the AAA in effect on the date of commencement of the arbitration, subject to the provisions of this Section 10.6. The arbitration shall be conducted as follows:

10.6.1 The arbitration shall be conducted by three arbitrators, each of whom by training, education, or experience has knowledge of the research, development, and commercialization of biological therapeutic products in the United States. The arbitration shall be conducted in English and held in New York, New York.

10.6.2 In its demand for arbitration, the Party initiating the arbitration shall provide a statement setting forth the nature of the dispute, the names and addresses of all other parties, an estimate of the amount involved (if any), the remedy sought, otherwise specifying the issue to be resolved, and appointing one neutral arbitrator. In an answering statement to be filed by the responding Party within [***] after confirmation of the notice of filing of the demand is sent by the AAA, the responding Party shall appoint one neutral arbitrator. Within [***] from the date on which the responding Party appoints its neutral arbitrator, the first two arbitrators shall appoint a chairperson.

10.6.3 If a Party fails to make the appointment of an arbitrator as provided in Section 10.6.2, the AAA shall make the appointment. If the appointed arbitrators fail to appoint a chairperson within the time specified in Section 10.6.2 and there is no agreed extension of time, the AAA shall appoint the chairperson.

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT UNDER RULE 406 PROMULGATED UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

10.6.4 The arbitrators will render their award in writing and, unless all Parties agree otherwise, will include an explanation in reasonable detail of the reasons for their award. Judgment upon the award rendered by the arbitrators may be entered in any court having jurisdiction thereof, including in the courts described in Section 10.5. The arbitrators will have the authority to grant injunctive relief and other specific performance; provided that the arbitrators will have no authority to award damages in contravention of this Agreement, and each Party irrevocably waives any claim to such damages in contravention of this

Agreement. The arbitrators will, in rendering their decision, apply the substantive law of the State of Delaware, without giving effect to conflict of law provisions that may require the application of the laws of another jurisdiction. The decision and award rendered by the arbitrators will be final and non-appealable (except for an alleged act of corruption or fraud on the part of the arbitrator).

10.6.5 The Parties shall use their reasonable efforts to conduct all dispute resolution procedures under this Agreement as expeditiously, efficiently, and cost-effectively as possible.

10.6.6 All expenses and fees of the arbitrators and expenses for hearing facilities and other expenses of the arbitration will be borne equally by the Parties unless the Parties agree otherwise or unless the arbitrators in the award assess such expenses against one of the Parties or allocate such expenses other than equally between the Parties. Each of the Parties will bear its own counsel fees and the expenses of its witnesses except to the extent otherwise provided in this Agreement or by applicable law.

10.6.7 Compliance with this Section 10.6 is a condition precedent to seeking relief in any court or tribunal in respect of a dispute, but nothing in this Section 10.6 will prevent a Party from seeking equitable or other interlocutory relief in the courts of appropriate jurisdiction, pending the arbitrators' determination of the merits of the controversy, if applicable to protect the confidential information, property, or other rights of that Party or to otherwise prevent irreparable harm that may be caused by the other Party's actual or threatened breach of this Agreement.

10.7 No Discrimination. Licensee, its Affiliates, and any Sublicensees, in their respective activities under this Agreement, shall not discriminate against any employee or applicant for employment because of race, color, sex, sexual, or affectional preference, age, religion, national, or ethnic origin, handicap, or because he or she is a disabled veteran or a veteran (including a veteran of the Vietnam Era).

10.8 Compliance with Law. Licensee (and its Affiliates' and any Sublicensees') must comply with all prevailing laws, rules, and regulations that apply to its activities or obligations under this Agreement. Without limiting the foregoing, it is understood that this Agreement may be subject to United States laws and regulations controlling the export of technical data, computer software, laboratory prototypes, and other commodities, articles, and information, including the Arms Export Control Act as amended in the Export Administration Act of 1979 and that Licensee's obligations are contingent upon compliance with applicable United States export laws and regulations. The transfer of certain technical data and commodities may require a license from the cognizant agency of the United States Government and/or written assurances by Licensee that Licensee shall not export data or commodities to certain foreign countries without prior

approval of such agency. Licensor neither represents that a license is not required nor that, if required, it will issue.

10.9 Entire Agreement. This Agreement embodies the entire understanding between the Parties relating to the subject matter hereof and supersedes all prior understandings and agreements, whether written or oral, including that certain Mutual Confidentiality Agreement effective as of December 12, 2013 between the Parties. All "Confidential Information" disclosed by the Parties pursuant to such Mutual Confidentiality Agreement shall be deemed "Confidential Information" under this Agreement (unless and until it falls within one of the exclusions set forth in Section 1.7). This Agreement may not be varied except by a written document signed by duly authorized representatives of both Parties.

10.10 Marking. Licensee, its Affiliates, and any Sublicensees shall mark any Licensed Product (or their containers or labels) made, sold, or otherwise distributed by it or them under this Agreement with any notice of patent rights necessary or (to the extent commercially feasible and consistent with prevailing business practices) desirable under applicable law to enable the Licensed Commercial Patents to be enforced to their full extent in any country where Licensed Products are made, used, sold, offered for sale, or imported.

10.11 Severability and Reformation. If any provision of this Agreement is held to be invalid or unenforceable by a court of competent jurisdiction, then such invalid or unenforceable provision will be automatically revised to be a valid or enforceable provision that comes as close as permitted by law to the Parties' original intent; provided that, if the Parties cannot agree upon such valid or enforceable provision, the remaining provisions of this Agreement will remain in full force and effect, unless the invalid or unenforceable provisions are of such essential importance to this Agreement that it is to be reasonably assumed that the Parties would not have entered into this Agreement without the invalid or unenforceable provisions.

10.12 Further Assurances. Each Party hereto agrees to execute, acknowledge, and deliver such further instruments, and to do all other acts, as may be necessary or appropriate in order to carry out the purposes and intent of this Agreement.

10.13 Interpretation; Construction. The captions to the several Articles and Sections of this Agreement are included only for convenience of reference and shall not in any way affect the construction of, or be taken into consideration in interpreting, this Agreement. In this Agreement, unless the context requires otherwise, (a) the word "including" shall be deemed to be followed by the phrase "without limitation" or like expression; (b) references to the singular shall include the plural and vice versa; (c) references to masculine, feminine, and neuter pronouns and expressions shall be interchangeable; (d) the words "herein" or "hereunder" relate to this Agreement; (e) "or" is disjunctive but not necessarily exclusive; (f) the word "will" shall be construed to have the same meaning and effect as the word "shall"; (g) all references to "dollars" or "$" herein shall mean U.S. Dollars; (h) unless otherwise provided, all reference to Sections, Articles, and exhibits in this Agreement are to Sections, Articles, and exhibits of and in this Agreement; and (i) whenever this Agreement refers to a number of days, such number shall refer to calendar days unless business days are specified. Business days shall mean a day on which banking institutions in Washington, D.C. are open for business. Each Party represents that it has been represented by legal counsel in connection with this Agreement and acknowledges that it

has participated in the drafting hereof. In interpreting and applying the terms and provisions of this Agreement, the Parties agree that no presumption will apply against the Party which drafted such terms and provisions.

10.14 Cumulative Rights and Remedies. The rights and remedies provided in this Agreement and all other rights and remedies available to either Party at law or in equity are, to the extent permitted by law, cumulative and not exclusive of any other right or remedy now or hereafter available at law or in equity. Neither asserting a right nor employing a remedy shall preclude the concurrent assertion of any other right or employment of any other remedy, nor shall the failure to assert any right or remedy constitute a waiver of that right or remedy.

10.15 Counterparts. This Agreement may be executed in one or more counterparts, each of which will be deemed an original, but all of which together will constitute one and the same instrument.

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CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT WERE OMITTED AND REPLACED WITH "[***]". A COMPLETE VERSION OF THIS EXHIBIT HAS BEEN FILED SEPARATELY WITH THE SECRETARY OF THE SECURITIES AND EXCHANGE COMMISSION PURSUANT TO AN APPLICATION REQUESTING CONFIDENTIAL TREATMENT UNDER RULE 406 PROMULGATED UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

IN WITNESS WHEREOF, the Parties, intending to be legally bound, have caused this License Agreement to be executed by their duly authorized representatives.

REGENX BIOSCIENCES, LLC	VOYAGER THERAPEUTICS, INC.
By: /s/ Kenneth T. Mills	By: /s/ Mark Levin
Name: Kenneth T. Mills	Name: Mark Levin
Title: President & CEO	Title: CEO

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Exhibit A
Licensed Research Patents

Application #	Title	Inventors	Nos.	Penn Docket #
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
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Exhibit B
Press Release

REGENX BIOSCIENCES AND VOYAGER THERAPEUTICS ANNOUNCE LICENSE AGREEMENT

- Voyager acquires rights to REGENX's proprietary NAV® vectors in multiple CNS disorders
  - Eighth third-party commercial license of REGENX's NAV vectors since 2010
- REGENX to receive undisclosed upfront payment, milestones and royalties in exchange for non-exclusive worldwide license

WASHINGTON, DC and CAMBRIDGE, Mass. June 2, 2014 – REGENX Biosciences, LLC and Voyager Therapeutics today announced that they have entered into a license agreement for use of REGENX's proprietary NAV® vectors for the development and commercialization of gene therapies to treat Amyotrophic Lateral Sclerosis (ALS), Friedreich's ataxia (FA) and Huntington's disease (HD).

Under the terms of the agreement, REGENX has granted Voyager a non-exclusive worldwide license, as well as sublicensing rights, to REGENX's NAV vectors for the treatment of ALS, FA and HD. In exchange for these rights, REGENX will receive an undisclosed upfront payment, ongoing fees, milestone payments, and royalties on net sales of products incorporating NAV vectors. REGENX will also receive a share of certain sublicensing revenues.

"This license agreement serves as further validation of our proprietary NAV vector technology platform, and is an important step towards the successful development of NAV-based gene delivery treatments for patients afflicted with the serious and debilitating rare diseases to which Voyager is committed," said Ken Mills, President and CEO of REGENX. "As the leader in next-generation AAV gene therapy, REGENX is pleased to be collaborating with Voyager, which is well-positioned to develop innovative treatments through the application of our NAV technology."

Mark Levin, Interim CEO of Voyager, commented, "Voyager is the leading AAV gene therapy company focused on developing life-changing treatments for patients with devastating CNS disorders. We are committed to advancing the AAV gene therapy field via broad-based investment in a number of key technological areas. In addition to providing a valuable addition to Voyager's intellectual property portfolio, the rights to use REGENX's NAV vectors will position us to rapidly advance the development of breakthrough CNS gene therapies."

About Amyotrophic Lateral Sclerosis

Amyotrophic Lateral Sclerosis (ALS), also known as Lou Gehrig's disease, is a progressive, fatal neurodegenerative disease that leads to muscle weakness, loss of mobility, impaired speech, and difficulty breathing and swallowing. Most ALS patients only live three to five years after initial

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symptoms appear, and it is estimated that as many as 30,000 patients in the United States and 450,000 worldwide are living with the disease. Familial ALS accounts for 5 to 10 percent of ALS cases, including an estimated 20 percent of familial ALS cases caused by toxic gain of function mutations in the SOD1 gene.

About Friedreich's Ataxia

Friedreich's ataxia (FA) is the most common hereditary ataxia, with approximately 8,000 patients living with the disease in the United States and Europe. FA patients have a genetic mutation in the FXN gene, which limits the production of the protein frataxin, causing a variety of debilitating symptoms and complications, loss of coordination and balance, muscle weakness, impaired vision, hearing and speech, scoliosis, diabetes, and cardiomyopathy.

About Huntington's Disease

Huntington's disease (HD) is an inherited neurodegenerative disorder where symptoms typically become noticeable between 30 and 50 years of age. HD is caused by a genetic mutation in the huntingtin gene, which leads to the production of a mutated huntingtin protein, resulting in symptoms such as chorea, rigidity, abnormal posturing, cognitive impairment and psychiatric symptoms, and difficulty with speech and swallowing. It is estimated that 1 in every 10,000 Americans has HD and more than 250,000 others are at-risk of having inherited the HD genetic mutation.

About REGENX Biosciences

ReGenX Biosciences is the leading next-generation AAV gene therapy company, developing a new class of personalized therapies based on its proprietary NAV® vector technology platform for a range of severe diseases with serious unmet needs. NAV vector technology includes novel AAV vectors rAAV7, rAAV8, rAAV9, and rAAVrh10. The company's treatments in development include programs addressing lysosomal storage disorders and ocular diseases. ReGenX's leadership in AAV gene therapy and corresponding intellectual property has enabled it to establish collaborations with leading global partners including Baxter Healthcare, Fondazione Telethon, Audentes Therapeutics, Lysogene, Esteve, AveXis and AAVLife. In addition, together with Fidelity Biosciences, ReGenX formed Dimension Therapeutics, a company focused on the development and commercialization of AAV gene therapies for rare diseases.

For more information regarding ReGenX, please visit www.regenxbio.com.

About Voyager Therapeutics

Voyager Therapeutics is a gene therapy company developing life-changing treatments for fatal and debilitating diseases of the central nervous system (CNS). Voyager is committed to advancing the field of AAV (adeno-associated virus) gene therapy through innovation and investment in vector optimization and engineering, dosing techniques, as well as process development and production. The company's initial pipeline is focused on CNS diseases in dire need of effective new therapies,

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including Parkinson's disease, a monogenic form of amyotrophic lateral sclerosis (ALS), and Friedreich's ataxia. Founded by scientific and clinical leaders in the fields of AAV gene therapy, expressed RNA interference and neuroscience, Voyager Therapeutics was launched in 2014 with funding from leading life sciences investor Third Rock Ventures and is headquartered in Cambridge, Mass. For more information, please visit www.voyagertherapeutics.com.

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