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As filed with the Securities and Exchange Commission on January 17, 2014.

Registration No. 333-192244

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Amendment No. 2
to
FORM S-1

REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

ULTRAGENYX PHARMACEUTICAL INC.

(Exact name of Registrant as specified in its charter)

Delaware	**2834**	**27-2546083**
(State or other jurisdiction of incorporation or organization)	*(Primary Standard Industrial Classification Code Number)*	*(I.R.S. Employer Identification Number)*

60 Leveroni Court
Novato, CA 94949
(415) 483-8800
(Address, including zip code, and telephone number, including area code, of Registrant's principal executive offices)

Emil D. Kakkis, M.D., Ph.D.
President and Chief Executive Officer
Ultragenyx Pharmaceutical Inc.
60 Leveroni Court
Novato, CA 94949
(415) 483-8800
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

Ryan A. Murr, Esq. **Lisa M. Kahle, Esq.** **Ropes & Gray LLP** **Three Embarcadero Center, Third Floor** **San Francisco, CA 94111** **Telephone: (415) 315-6300** **Facsimile: (415) 315-6350**	**Shalini Sharp** **Chief Financial Officer** **Ultragenyx Pharmaceutical Inc.** **60 Leveroni Court** **Novato, CA 94949** **Telephone: (415) 483-8800** **Facsimile: (415) 483-8810**	**B. Shayne Kennedy, Esq.** **Brian J. Cuneo, Esq.** **Latham & Watkins LLP** **650 Town Center Drive, 20th Floor** **Costa Mesa, CA 92626** **Telephone: (714) 540-1235** **Facsimile: (714) 755-8290**

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

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

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

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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 ☐ Accelerated filer ☐ Non-accelerated filer ☒ Smaller reporting company ☐
(Do not check if a smaller reporting company)

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	**Amount to be Registered(1)**	**Proposed maximum aggregate offering price per share(2)**	**Proposed maximum aggregate offering price(2)**	**Amount of registration fee(3)**
Common Stock, $0.001 par value per share	5,564,516	$ 17.00	$ 94,596,772	$ 12,185

(1) Includes shares that the underwriters have the option to purchase to cover overallotments, if any.
(2) Estimated solely for the purpose of calculating the amount of the registration fee in accordance with Rule 457(a) under the Securities Act of 1933, as amended.
(3) Registration fees totaling $11,109 were previously paid in connection with the initial filing of this registration statement. The amount paid in connection with this filing for the aggregate registration fee of $12,185, which includes $11,109 previously paid and $1,076 for the additional amount of $8,346,772 of securities included in this amendment to the registration statement, is offset by the $11,109 previously paid.

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

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The information in this preliminary prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities, and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to completion, dated January 17, 2014

Prospectus

4,838,710 shares

Common Stock

This is an initial public offering of common stock by Ultragenyx Pharmaceutical Inc. We are selling 4,838,710 shares of common stock. The initial public offering price is between $14.00 and $17.00 per share.

Prior to this offering, there has been no public market for our common stock. We have applied for listing of our common stock on The NASDAQ Global Market under the symbol “RARE”.

We are an “emerging growth company” under applicable Securities and Exchange Commission rules and will be subject to reduced public company reporting requirements.

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

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

We have granted the underwriters an option for a period of 30 days to purchase up to 725,806 additional shares of common stock.

Investing in our common stock involves a high degree of risk. See “Risk Factors” beginning on page 10.

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.

The underwriters expect to deliver the shares of common stock to investors on or about , 2014.

J.P. Morgan **Morgan Stanley**

Cowen and Company

Canaccord Genuity

, 2014

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We have not authorized anyone to provide you with information other than that contained in this prospectus or in any free writing prospectus prepared by or on behalf of us or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give to you. We are offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or any sale of our common stock. Our business, financial condition, results of operations, and prospects may have changed since that date.

No action is being taken in any jurisdiction outside the United States to permit a public offering of our common stock or possession or distribution of this prospectus in that jurisdiction. Persons who come into possession of this prospectus in jurisdictions outside the United States are required to inform themselves about and to observe any restrictions as to this offering and the distribution of this prospectus applicable to that jurisdiction.

PROSPECTUS SUMMARY

The items in the following summary are described in more detail later in this prospectus. This summary provides an overview of selected information and does not contain all of the information you should consider before buying our common stock. Therefore, you should read the entire prospectus carefully, especially the "Risk Factors" section beginning on page 10 and our financial statements and the related notes appearing at the end of this prospectus, before deciding to invest in our common stock. In this prospectus, unless the context otherwise requires, references to "the Company," "we," "us," "our," or "Ultragenyx" refer to Ultragenyx Pharmaceutical Inc.

Overview

We are a development-stage biopharmaceutical company focused on the identification, acquisition, development, and commercialization of novel products for the treatment of rare and ultra-rare diseases, with an initial focus on serious, debilitating metabolic genetic diseases. We focus on diseases for which the unmet medical need is high, the biology for treatment is clear, and for which there are no approved therapies. Since our inception in 2010, we have in-licensed potential treatments for five different diseases that are or we expect will be in Phase 1/2 or Phase 2 clinical studies by early 2014. Our strategy, which is predicated upon time- and cost-efficient drug development, allows us to pursue multiple programs in parallel with the goal of delivering safe and effective therapies to patients with the utmost urgency.

Our current pipeline consists of two product categories: biologics, including a monoclonal antibody and enzyme replacement therapies; and small-molecule substrate replacement therapies. Enzymes are proteins that the body uses to process materials needed for normal cellular function, and substrates are the materials upon which enzymes act. When enzymes or substrates are missing, the body is unable to perform its normal cellular functions, often leading to significant clinical disease. Several of our therapies are intended to replace deficient enzymes or substrates.

The following table summarizes our product candidate pipeline:

Candidate	Description	Indication	Pre-clinical	Phase 1	Phase 1/2 or Phase 2	Phase 3 or pivotal	Status / Anticipated milestones	Ultragenyx commercial rights
Biologics								
KRN23 (UX023)	Anti-FGF23 monoclonal antibody	XLH					▪ Expect to initiate pediatric clinical development in 2014	▪ U.S. and Canada: Joint with KHK (profit share) ▪ Mexico, Central and South America
rhGUS (UX003)	Enzyme replacement	MPS 7					▪ Expect interim data from Phase 1/2 clinical study in 2014	▪ Worldwide
rhPPCA (UX004)	Enzyme replacement	Galactosialidosis					▪ Expect to continue preclinical development during 2014	▪ Worldwide
Substrate replacement therapies								
Triheptanoin (UX007)	Substrate replacement	LC-FAOD					▪ Expect to initiate Phase 2 clinical trial by early 2014	▪ Worldwide
Triheptanoin	Substrate replacement	Glut1 DS					▪ Expect to initiate Phase 2 clinical trial in the first half of 2014	▪ Worldwide
SA-ER (UX001)	Substrate replacement	HIBM					▪ Expect data from ongoing Phase 2 extension study in late 2014	▪ Worldwide (excluding Japan and certain other Asian territories)

Our current product candidate pipeline has been either in-licensed from academic institutions or derived from partnerships with other pharmaceutical companies. Where possible, our strategy is to acquire and retain

global commercialization rights to our products to maximize long-term value. Over time, we intend to build our own commercial organization, which we believe will be of modest size due to the relatively small number of specialists who treat patients with rare and ultra-rare diseases.

The patients we seek to treat have diseases with limited or no treatment options, and we recognize that their lives and well-being are highly dependent upon our efforts to develop new therapies. For this reason, we are passionate about developing these therapies with the utmost urgency and care. We strive to build a company that is faster, better, and smarter about advancing multiple product candidates through approval.

We were founded in April 2010 by our current President and Chief Executive Officer, Dr. Emil Kakkis, M.D., Ph.D., who is the former Chief Medical Officer of BioMarin Pharmaceutical Inc. We have assembled an experienced team with extensive drug development and commercialization capabilities, particularly in the orphan drug area. Dr. Kakkis and the team at Ultragenyx have been previously involved, at other companies, in the development and/or commercialization of many therapies approved or in development for rare metabolic genetic diseases, including Aldurazyme, Naglazyme, Kuvan, and Vimizim (BioMarin); Lumizyme/Myozyme (Sanofi-Genzyme); and asfotase alpha (Enobia; now Alexion). Our investors include, but are not limited to, the following entities, their affiliates or funds advised by them: TPG Biotech, Fidelity Biosciences (Beacon Bioventures), HealthCap, Pappas Ventures, Adage Capital Partners, L.P., Capital Research Global Investors, Columbia Wanger Asset Management, Jennison Associates LLC, BlackRock, Inc., Genzyme Corporation, Shire LLC, and Ramius LLC.

Product Candidates

KRN23 (UX023) for the treatment of XLH

KRN23 is a fully human monoclonal antibody administered via subcutaneous injection that is designed to bind and reduce the biological activity of fibroblast growth factor 23, or FGF23, to increase abnormally low phosphate levels in patients with X-linked hypophosphatemia, or XLH. Patients with XLH have low serum phosphate levels due to excessive phosphate loss into the urine, which is directly caused by the effect on kidney function of excess FGF23 production in bone cells. Low phosphate levels lead to poor bone mineralization and a variety of clinical manifestations, including skeletal deformity, bone pain, short stature, gross motor impairment, muscle weakness, and lower than normal bone density. There is no approved drug therapy or treatment for the underlying cause of XLH. Most patients are managed using oral phosphate replacement and vitamin D therapy, which is only partially effective at restoring bone physiology and growth and has significant side effects.

In August 2013, we formed a collaboration with Kyowa Hakko Kirin Co., Ltd., or KHK, to jointly develop and commercialize KRN23 for the treatment of XLH. KHK has conducted one Phase 1, one Phase 1/2 study and one Phase 1/2 extension study of KRN23 in adults with XLH. We expect to release data for the Phase 1/2 studies in 2014. Results from the Phase 1 single dose study demonstrated that KRN23 was well tolerated. The data suggest efficacy in increasing serum phosphate levels, while reducing urinary excretion of phosphate. We expect to continue to develop KRN23 in adults with XLH. In addition, we expect to initiate a Phase 2 pediatric study in 2014. Given the high turnover and growth of bone during childhood and the critical role phosphate plays in bone growth, pediatric XLH patients have the highest morbidity and potential for benefit.

rhGUS (UX003) for the treatment of MPS 7

Recombinant human beta-glucuronidase, or rhGUS, is an intravenous, or IV, enzyme replacement therapy for the treatment of mucopolysaccharidosis 7, or MPS 7, also known as Sly Syndrome. Patients with MPS 7 suffer from severe cellular and organ dysfunction that typically leads to death in the teens or early adulthood. MPS 7 is caused by a deficiency of the lysosomal enzyme beta-glucuronidase, which is required for the breakdown of certain complex carbohydrates known as glycosaminoglycans, or GAGs. The inability to properly break down GAGs leads to their accumulation in many tissues, resulting in a serious multi-system disease. There are currently no approved drug therapies for MPS 7.

We licensed exclusive worldwide rights to rhGUS-related know-how and cell lines from Saint Louis University in November 2010. We have conducted preclinical studies to support the chronic IV administration of rhGUS. In December 2013 we initiated an open-label, Phase 1/2 study to evaluate the safety, tolerability, efficacy, and dose of IV administration every other week of rhGUS in four to five patients with MPS 7 who are between five and 30 years of age. The initial 12-week treatment period will be followed by a dose-titration period and a long-term extension study. We expect to receive interim data from this study in 2014. If results from the initial 12-week treatment period from this study are supportive, we plan to initiate a pivotal Phase 3 study enrolling at least 12 patients.

rhPPCA (UX004) for the treatment of galactosialidosis

Recombinant human protective protein cathepsin-A, or rhPPCA, which we in-licensed from St. Jude Children's Research Hospital in September 2012, is in preclinical development as an enzyme replacement therapy for galactosialidosis, a rare lysosomal storage disease for which there are no currently approved drug therapies. Similar to MPS patients, patients with galactosialidosis present with both soft tissue storage in the liver, spleen, and other tissues, as well as connective tissue (bone and cartilage) related disease. As with MPS 7, an enzyme deficiency results in accumulation of substrates in the lysosomes, causing skeletal and organ dysfunction, and death. We plan to continue preclinical development of rhPPCA during 2014.

Triheptanoin (UX007) for the treatment of LC-FAOD

We are developing triheptanoin for oral liquid administration intended as a substrate replacement therapy for patients with long-chain fatty acid oxidation disorders, or LC-FAOD. Triheptanoin is a medium-chain triglyceride of three seven-carbon fatty acids designed to provide substrate replacement for fatty acid metabolism and restore production of energy. Patients with LC-FAOD have a deficiency that impairs the ability to produce energy from fat, which can lead to depletion of all glucose in the body, and severe liver, muscle, and heart disease, as well as death. There are currently no approved drugs or treatments specifically for LC-FAOD. The current standard of care for LC-FAOD includes diligent prevention of fasting combined with the use of low-fat/high-carbohydrate diets, carnitine supplementation in some cases, and medium-chain triglyceride, or MCT, oil supplementation. Despite treatment with the current standard of care, many patients continue to suffer significant morbidity and mortality.

Triheptanoin has been studied clinically for 13 years in approximately 130 human subjects affected by a variety of diseases, including 65 patients with LC-FAOD. Multiple investigator-sponsored open-label studies suggest clinical improvements with triheptanoin treatment, even for patients who were on standard of care. We recently completed a retrospective medical record review study to assess the clinical outcome of triheptanoin treatment on LC-FAOD subjects who have been participating in a compassionate use program at the University of Pittsburgh Medical Center. The data showed that treatment with triheptanoin appeared to reduce the frequency and severity of hospitalizations previously experienced by these patients.

We licensed certain intellectual property rights relating to triheptanoin from Baylor Research Institute in September 2012. Triheptanoin is in an ongoing investigator-sponsored Phase 2 study for the treatment of LC-FAOD. We plan to initiate a prospective open-label Phase 2 study of triheptanoin treatment in approximately 30 severely affected LC-FAOD patients in early 2014. The effects of treatment on clinical and physiologic disease will be assessed in three areas: skeletal myopathy, liver disease, and cardiac disease. A principal goal of the study is to determine the appropriate clinical endpoints and patient population for testing in potential later-stage pivotal studies.

Triheptanoin (UX007) for the treatment of Glut1 DS

We are also developing triheptanoin for patients with glucose transporter type-1 deficiency syndrome, or Glut1 DS. Glut1 DS is caused by a mutation affecting the gene that codes for Glut1, which is a protein that

transports glucose from blood into the brain. Because glucose is the primary source of energy for the brain, Glut1 DS results in a chronic state of energy deficiency in the brain and is characterized by seizures, developmental delay, and movement disorder. There are currently no approved drugs specific to Glut1 DS. The current standard of care for Glut1 DS is the ketogenic diet, an extreme high-fat (70-80% of daily calories as fat)/low-carbohydrate diet, which generates ketone bodies as an alternative energy source to glucose. The ketogenic diet is difficult to comply with and has demonstrated limited effectiveness in the treatment of developmental delay and movement disorder.

Triheptanoin is intended as a substrate replacement therapy to provide an alternative source of energy to the brain in Glut1 DS patients. Although an open-label investigator-sponsored clinical study is ongoing and the results have not yet been reported, there are anecdotal reports of benefit in terms of reduced seizures and improved development rate in some Glut1 DS subjects taking triheptanoin. We are planning to initiate a clinical development program to study the effects of triheptanoin in Glut1 DS in the first half of 2014. We anticipate that the program will initially consist of a Phase 2 adaptive, randomized, double-blind, placebo-controlled, parallel-group study of at least 30 patients between three and 17 years of age inclusive who are currently not on, or not fully compliant with, ketogenic diet.

SA-ER (UX001) for the treatment of HIBM

We are developing an extended-release, oral formulation of sialic acid, or SA-ER, for the treatment of hereditary inclusion body myopathy, or HIBM, which is also known as GNE myopathy. HIBM is characterized by severe progressive muscular myopathy, or disease in which muscle fibers do not function properly, with onset typically in the late teens or twenties. Patients with HIBM have a genetic defect in the gene coding for a particular enzyme that is involved in the first step in the biosynthesis of sialic acid. Therefore, HIBM patients have a sialic acid deficiency, which interferes with muscle function, leading to myopathy and atrophy. Patients typically become wheelchair bound within ten to 20 years from onset. There is no approved drug therapy for HIBM.

SA-ER is intended as a substrate replacement therapy designed to address sialic acid deficiency and restore muscle function in HIBM patients. We have conducted a Phase 2 randomized, double-blind, placebo-controlled study of SA-ER in 46 HIBM patients. Top-line results after 48 weeks of treatment showed a modest increase in upper extremity muscle strength composite at the higher dose and a statistically significant difference versus the decline observed at the lower dose. A positive trend was seen in a patient-reported outcome of functional activity. The results were consistent with the 24-week analysis. SA-ER appears to be well tolerated with no serious adverse events observed to date in either dose group. We plan to continue to treat these patients in an extension study with an increased dosage of sialic acid based on the dose dependence observed at weeks 24 and 48. We anticipate that data from the extension study should be available in late 2014.

Our Strategy

Our strategy is to identify, acquire, develop, and commercialize novel products for the treatment of rare and ultra-rare diseases in the United States, the European Union, and select international markets, with the goal of becoming a leading rare disease company. The critical components of our business strategy include the following:

- Focus on rare and ultra-rare diseases with significant unmet medical need;
- Focus on diseases and therapies with clear mechanisms of action;
- Leverage our experience and relationships to in-license promising product candidates;
- Develop and commercialize multiple product candidates in parallel;
- Focus on excellent and rapid clinical and regulatory execution; and
- Seek to retain global commercialization rights to product candidates.

Risks Associated with Our Business

Our ability to implement our business strategy is subject to numerous risks that you should be aware of before making an investment decision. These risks are described more fully in the section entitled "Risk Factors" immediately following this prospectus summary. These risks include, among others:

- We are a development-stage company and have a limited operating history on which to assess our business, have incurred significant losses since our inception, and anticipate that we will continue to incur significant losses for the foreseeable future;
- Even if this offering is successful, we expect that we will need to raise additional funding before we can expect to become profitable from sales of our products;
- We are heavily dependent upon the success of our product candidates, which are in the early stages of clinical development, and we cannot provide any assurance that any of our product candidates will receive regulatory approval;
- Because the target patient populations of our product candidates are small, we must be able to successfully identify patients and acquire a significant market share to achieve profitability and growth;
- The insurance coverage and reimbursement status of newly-approved orphan products is uncertain and failure to obtain or maintain adequate coverage and reimbursement for our product candidates could limit our ability to market those products and decrease our ability to generate revenue;
- If we are unable to obtain and maintain effective intellectual property rights for our technologies, product candidates, or any future product candidates, we may not be able to compete effectively in our markets; and
- Our future success depends in part upon our ability to retain our Founder, President, and Chief Executive Officer and to attract, retain, and motivate other qualified personnel.

Our Corporate Information

We were founded in April 2010 as a California corporation, and we reincorporated as a Delaware corporation in June 2011. Our principal executive offices are located at 60 Leveroni Court, Novato, CA 94949, and our telephone number is (415) 483-8800. Our web site address is www.ultragenyx.com. The information on, or that can be accessed through, our web site is not part of this prospectus. We have included our web site address as an inactive textual reference only.

We have filed trademark applications with the U.S. Patent and Trademark Office for the marks Ultragenyx™ and Ultragenyx Pharmaceutical™, and we are developing commercial names for our product candidates. This prospectus also contains trademarks of others, including Aldurazyme®, Naglazyme®, Kuvan®, Vimizim™, Lumizyme®, Myozyme® and asfotase alpha. We do not intend our use or display of other companies' trade names or trademarks to imply a relationship with, or endorsement or sponsorship of us by, any other companies.

THE OFFERING

Common stock offered by us	4,838,710 shares
Common stock to be outstanding after this offering	28,140,212 shares (or 28,866,018 shares if the underwriters exercise their option to purchase additional shares in full)
Underwriters' option to purchase additional shares	725,806 shares
Use of proceeds	We estimate that the net proceeds from this offering will be approximately $66.8 million, or approximately $77.2 million if the underwriters exercise their option to purchase additional shares in full, at an assumed initial public offering price of $15.50 per share, the midpoint of the price range set forth on the cover of this prospectus, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. We intend to use the net proceeds from this offering, together with our existing cash, cash equivalents, and marketable securities to advance our ongoing clinical programs for KRN23, rhGUS, triheptanoin in both LC-FAOD and Glut1 DS, and SA-ER, to pay a cash dividend to holders of our preferred stock payable upon conversion of the shares to common stock, and any remaining proceeds for preclinical research, working capital, and other general corporate purposes. See "Use of Proceeds."
Risk factors	You should read the "Risk Factors" section of this prospectus for a discussion of factors to consider carefully before deciding to invest in shares of our common stock.
Directed share program	At our request, the underwriters have reserved up to 241,935 shares of our common stock offered by this prospectus for sale, at the initial public offering price, to our directors and officers and certain employees and other parties related to us. Shares purchased by our directors and officers will be subject to the 180-day lock-up restriction described in the "Underwriting" section of this prospectus. The number of shares of common stock available for sale to the general public will be reduced to the extent these individuals purchase such reserved shares. Any reserved shares that are not so purchased will be offered by the underwriters to the general public on the same basis as the other shares offered by this prospectus.
Proposed NASDAQ Global Market symbol	"RARE"

The number of shares of common stock to be outstanding after this offering is based on 3,703,016 shares of common stock outstanding as of September 30, 2013 and 19,598,486 additional shares of our common stock issuable upon conversion of all of our outstanding shares of preferred stock upon closing of this offering.

The number of shares of our common stock to be outstanding after this offering excludes the following:

- 1,526,772 shares of common stock issuable upon the exercise of outstanding stock options as of September 30, 2013 having a weighted-average exercise price of $0.86 per share;
- 327,853 shares of common stock issuable upon the exercise of outstanding warrants as of September 30, 2013 having a weighted-average exercise price of $3.241 per share;

- 1,565,352 shares of common stock reserved for issuance pursuant to future equity awards under our 2011 Equity Incentive Plan, as amended, as of September 30, 2013, which will become available for issuance under our 2014 Incentive Plan after the completion of this offering;
- 2,250,000 shares of common stock reserved for issuance (including the above-referenced shares reserved for issuance under our 2011 Equity Incentive Plan, as amended) pursuant to future equity awards under our 2014 Incentive Plan, as well as any future increases in the number of shares of our common stock reserved for future issuance under this plan, which will become effective immediately prior to the completion of this offering; and
- 600,000 shares of common stock reserved for future issuance under our 2014 Employee Stock Purchase Plan, or 2014 ESPP, as well as any future increases in the number of shares of our common stock reserved for future issuance under the 2014 ESPP, which will become effective immediately prior to the completion of this offering.

Except as otherwise indicated, all information contained in this prospectus:

- reflects a 1-for-3.1345 reverse stock split of our common stock that we effected on January 17, 2014;
- reflects the conversion of all of our outstanding shares of preferred stock into an aggregate of 19,598,486 shares of common stock immediately prior to the completion of this offering;
- assumes the effectiveness of our amended and restated certificate of incorporation and amended and restated by-laws immediately prior to the completion of this offering;
- assumes that the underwriters do not exercise their option to purchase additional shares; and
- assumes no exercise of outstanding options or warrants after September 30, 2013.

SUMMARY FINANCIAL DATA

The following table summarizes our statements of operations and balance sheet data. We have derived the following statements of operations data for the years ended December 31, 2011 and 2012 from our audited financial statements appearing elsewhere in this prospectus. The statements of operations data for the nine months ended September 30, 2012 and 2013 and the balance sheet data as of September 30, 2013 are derived from our unaudited financial statements appearing elsewhere in this prospectus. In our opinion, these unaudited financial statements have been prepared on a basis consistent with our audited financial statements and contain all adjustments, consisting only of normal and recurring adjustments, necessary for a fair presentation of such financial data. You should read this data together with our financial statements and related notes appearing elsewhere in this prospectus and the information under the captions "Selected Financial Data" and "Management's Discussion and Analysis of Financial Condition and Results of Operations." Our historical results are not necessarily indicative of our future results, and our operating results for the nine-month period ended September 30, 2013 are not necessarily indicative of the results that may be expected for the year ended December 31, 2013 or any other interim periods or any future year or period.

	Year Ended December 31,		Nine Months Ended September 30,	
	2011	2012	2012	2013
	(In thousands, except share and per share amounts)		(unaudited)	
Statements of Operations Data:				
Operating expenses:				
Research and development	$ 4,717	$ 12,641	$ 8,866	$ 19,625
General and administrative	1,844	3,344	2,441	3,130
Total operating expenses	6,561	15,985	11,307	22,755
Loss from operations	(6,561)	(15,985)	(11,307)	(22,755)
Interest income	4	1	—	157
Interest expense	(270)	—	—	—
Other expense	(22)	(350)	(97)	(1,155)
Net loss	$ (6,849)	$ (16,334)	$ (11,404)	$ (23,753)
Net loss attributable to common stockholders [1]	$ (7,466)	$ (19,561)	$ (12,749)	$ (31,624)
Net loss per share attributable to common stockholders, basic and diluted	$ (4.62)	$ (14.20)	$ (12.35)	$ (9.70)
Shares used to compute net loss per share attributable to common stockholders, basic and diluted	1,617,384	1,377,207	1,032,159	3,260,484
Pro forma net loss per share attributable to common stockholders, basic and diluted (unaudited) [1]		$ (2.02)		$ (1.16)
Shares used to compute pro forma net loss per share attributable to common stockholders, basic and diluted (unaudited) [1]		9,999,398		23,126,389

	As of September 30, 2013		
	Actual	Pro Forma[2]	Pro Forma as Adjusted[3][4]
		(unaudited) (in thousands)	
Balance Sheet Data:			
Cash, cash equivalents and marketable securities	$ 63,657	$ 63,657	$ 126,262
Working capital	61,067	56,922	123,672
Total assets	68,592	68,592	131,197
Convertible preferred stock warrant liability	1,596	—	—
Convertible preferred stock	118,002	—	—
Deficit accumulated during the development stage	(56,846)	(56,846)	(56,846)
Total stockholders' (deficit) equity	(56,848)	58,605	125,355

(1) See Notes 2 and 14 to our audited financial statements and Note 8 of our unaudited financial statements included elsewhere in this prospectus for an explanation of the calculations of our basic and diluted net loss per share attributable to common stockholders and pro forma net loss per share attributable to common stockholders.

(2) Pro forma to reflect (i) the conversion of all of our outstanding shares of convertible preferred stock into an aggregate of 19,598,486 shares of our common stock, (ii) the reclassification to additional paid-in capital of our preferred stock warrant liability in connection with the conversion of our outstanding preferred stock warrants into common stock warrants, and (iii) a dividend of $4.1 million payable concurrent with the conversion of our preferred stock to common stock to the holders of our preferred stock, which has been calculated as if the conversion of preferred stock into common stock occurred as of January 17, 2014, in each case, immediately prior to the completion of this offering. Since the dividend represents distributions to existing stockholders to be made from the proceeds of the offering, the pro forma balance sheet data reflects the accrual of the estimated dividend to be paid.

(3) Pro forma as adjusted to further reflect (i) the sale of 4,838,710 shares of common stock in this offering at an assumed initial public offering price of $15.50 per share, the midpoint of the price range set forth on the cover of this prospectus, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us and (ii) the payment of the $4.1 million dividend payable described above.

(4) A $1.00 increase (decrease) in the assumed initial public offering price of $15.50 per share, the midpoint of the price range set forth on the cover of this prospectus, would increase (decrease) each of cash, cash equivalents and marketable securities, working capital, total assets, and total stockholders' equity by approximately $4.5 million, assuming that the number of shares offered by us, as set forth on the cover of this prospectus, 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 would increase each of cash, cash equivalents and marketable securities, working capital, total assets, and total stockholders' equity by approximately $14.4 million after deducting estimated underwriting discounts and commissions and any estimated offering expenses payable by us. Conversely, a 1,000,000 share decrease in the number of shares offered by us would decrease each of cash, cash equivalents and marketable securities, working capital, total assets, and total stockholders' equity by approximately $14.4 million after deducting estimated underwriting discounts and commissions and any estimated offering expenses payable by us.

RISK FACTORS

An investment in shares of our common stock involves a high degree of risk. You should carefully consider the following information about these risks, together with the other information appearing elsewhere in this prospectus, including our financial statements and related notes thereto, before deciding to invest in our common stock. The occurrence of any of the following risks could have a material adverse effect on our business, financial condition, results of operations and future growth prospects. In these circumstances, the market price of our common stock could decline, and you may lose all or part of your investment.

Risks Related to Our Financial Condition and Capital Requirements

We are a development-stage company and have a limited operating history on which to assess our business, have incurred significant losses since our inception, and anticipate that we will continue to incur significant losses for the foreseeable future.

We are a development-stage biopharmaceutical company with a limited operating history. We have incurred net losses in each year since our inception in April 2010, including net losses of $6.8 million and $16.3 million for the years ended December 31, 2011 and 2012, respectively, and $23.8 million for the nine months ended September 30, 2013. As of September 30, 2013, we had a deficit accumulated during the development stage of $56.8 million.

We have devoted substantially all of our financial resources to identify, acquire, and develop our product candidates, including conducting clinical studies and providing general and administrative support for these operations. To date, we have financed our operations primarily through the sale of equity securities and convertible promissory notes. The amount of our future net losses will depend, in part, on the rate of our future expenditures and our ability to obtain funding through equity or debt financings, strategic collaborations, or grants. Biopharmaceutical product development is a highly speculative undertaking and involves a substantial degree of risk. We are in the early stages of clinical development for our product candidates, we have not yet commenced pivotal clinical studies for any product candidate and it may be several years, if ever, before we complete pivotal clinical studies and have a product candidate approved for commercialization. If we obtain regulatory approval to market a product candidate, our future revenue will depend upon the size of any markets in which our product candidates may receive approval, and our ability to achieve sufficient market acceptance, pricing, reimbursement from third-party payors, and adequate market share for our product candidates in those markets. However, even if we obtain adequate market share for our product candidates, because the potential markets in which our product candidates may ultimately receive regulatory approval are very small, we may never become profitable despite obtaining such market share and acceptance of our products.

We expect to continue to incur significant expenses and increasing operating losses for the foreseeable future. We anticipate that our expenses will increase substantially if and as we:

- continue our research and nonclinical and clinical development of our product candidates;
- expand the scope of our current clinical studies for our product candidates;
- advance our programs into more expensive clinical studies;
- initiate additional nonclinical, clinical, or other studies for our product candidates;
- change or add additional manufacturers or suppliers;
- seek regulatory and marketing approvals for our product candidates that successfully complete clinical studies;
- establish a sales, marketing, and distribution infrastructure to commercialize any products for which we may obtain marketing approval;
- seek to identify, assess, acquire, and/or develop other product candidates;
- make milestone or other payments under any license agreements;

- seek to maintain, protect, and expand our intellectual property portfolio;
- seek to attract and retain skilled personnel;
- create additional infrastructure to support our operations as a public company and our product development and planned future commercialization efforts; and
- experience any delays or encounter issues with any of the above, including but not limited to failed studies, complex results, safety issues, or other regulatory challenges that require longer follow-up of existing studies, additional major studies, or additional supportive studies in order to pursue marketing approval.

Further, the net losses we incur may fluctuate significantly from quarter to quarter and year to year, such that a period-to-period comparison of our results of operations may not be a good indication of our future performance.

We have never generated any revenue from product sales and may never be profitable.

We have no products approved for commercialization and have never generated any revenue. Our ability to generate revenue and achieve profitability depends on our ability, alone or with strategic collaboration partners, to successfully complete the development of, and obtain the regulatory and marketing approvals necessary to commercialize one or more of our product candidates. We do not anticipate generating revenue from product sales for the foreseeable future. Our ability to generate future revenue from product sales depends heavily on our success in many areas, including but not limited to:

- completing research and nonclinical and clinical development of our product candidates;
- obtaining regulatory and marketing approvals for product candidates for which we complete clinical studies;
- developing a sustainable and scalable manufacturing process for any approved product candidates and establishing and maintaining supply and manufacturing relationships with third parties that can conduct the process and provide adequate (in amount and quality) products to support clinical development and the market demand for our product candidates, if approved;
- launching and commercializing product candidates for which we obtain regulatory and marketing approval, either directly or with a collaborator or distributor;
- obtaining market acceptance of our product candidates as viable treatment options;
- addressing any competing technological and market developments;
- identifying, assessing, acquiring and/or developing new product candidates;
- negotiating favorable terms in any collaboration, licensing, or other arrangements into which we may enter;
- maintaining, protecting, and expanding our portfolio of intellectual property rights, including patents, trade secrets, and know-how; 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, the European Medicines Agency, or the EMA, or other regulatory agencies, domestic or foreign, to change our manufacturing processes or assays, or to perform clinical, nonclinical, or other types of studies in addition to those that we currently anticipate. In cases where we are successful in obtaining regulatory approvals to market one or more of our product candidates, our revenue will be dependent, in part, upon the size of the markets in the territories for which we gain regulatory approval, the accepted price for the product, the ability to get reimbursement at any price, and whether we own the commercial rights for that territory. If the number of our

addressable rare disease patients is not as significant as we estimate, the indication approved by regulatory authorities is narrower than we expect, or the reasonably accepted population for treatment is narrowed by competition, physician choice or treatment guidelines, we may not generate significant revenue from sales of such products, even if approved. For example, the development of KRN23, rhGUS, and triheptanoin for pediatric use is an important part of our current business strategy; if we are unable to obtain regulatory approval for the desired age ranges, our business may suffer. Additionally, if we are not able to generate revenue from the sale of any approved products, we may never become profitable.

Even if this offering is successful, we expect that we will need to raise additional funding before we can expect to become profitable from sales of our products. This additional financing may not be available on acceptable terms, or at all. Failure to obtain this necessary capital when needed may force us to delay, limit, or terminate our product development efforts or other operations.

We are currently advancing our KRN23, rhGUS, triheptanoin, and SA-ER product candidates through clinical development and our other product candidate, rhPPCA, as well as our other early stage research projects, through preclinical development. Developing our product candidates is expensive, and we expect our research and development expenses to increase substantially in connection with our ongoing activities, particularly as we advance our product candidates through clinical studies.

As of September 30, 2013, our cash, cash equivalents and marketable securities were $63.7 million. We expect that our existing cash, cash equivalents and marketable securities, not including the proceeds we receive from this offering, will be sufficient to fund our current operations for at least the next 12 months; however, we expect that we will require additional capital to obtain regulatory approval for, and to commercialize, our product candidates. In addition, our operating plans may change as a result of many factors that may currently be unknown to us, and we may need to seek additional funds sooner than planned. Our future funding requirements will depend on many factors, including but not limited to:

- the scope, rate of progress, results and cost of our clinical studies, nonclinical testing, and other related activities;
- the cost of manufacturing clinical supplies, and establishing commercial supplies, of our product candidates and any products that we may develop;
- the number and characteristics of product candidates that we pursue;
- the cost, timing, and outcomes of regulatory approvals;
- the cost and timing of establishing sales, marketing, and distribution capabilities; and
- the terms and timing of any collaborative, licensing, and other arrangements that we may establish, including any required milestone and royalty payments thereunder.

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

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

Risks Related to the Discovery and Development of Our Product Candidates

We are heavily dependent on the success of our product candidates, which are in the early stages of clinical development. We cannot give any assurance that any of our product candidates will receive regulatory approval, which is necessary before they can be commercialized.

To date, we have invested substantially all of our efforts and financial resources to identify, acquire, and develop our product candidates, including conducting clinical studies and providing general and administrative support for these operations. Our future success is dependent on our ability to successfully develop, obtain regulatory approval for, and then successfully commercialize one or more product candidates. We currently generate no revenue from sales of any drugs, and we may never be able to develop or commercialize a marketable drug.

Each of our product candidates is in the early stages of development and will require additional clinical development, management of nonclinical, clinical, and manufacturing activities, regulatory approval, obtaining adequate manufacturing supply, building of a commercial organization, and significant marketing efforts before we generate any revenue from product sales. We currently have four product candidates in Phase 1/2 or Phase 2 clinical studies. None of our product candidates have advanced into a pivotal study and it may be years before such study is initiated, if at all. We are not permitted to market or promote any of our product candidates before we receive regulatory approval from the FDA or comparable foreign regulatory authorities, and we may never receive such regulatory approval for any of our product candidates.

Although certain of our employees have prior experience with submitting marketing applications to the FDA or comparable foreign regulatory authorities, we as a company have not submitted such applications for our product candidates. We cannot be certain that any of our product candidates will be successful in clinical studies or receive regulatory approval. Further, our product candidates may not receive regulatory approval even if they are successful in clinical studies. If we do not receive regulatory approvals for our product candidates, we may not be able to continue our operations.

We generally plan to seek regulatory approval to commercialize our product candidates in the United States, the European Union, or EU, and in additional foreign countries where we have commercial rights. To obtain regulatory approval in other countries, we must comply with numerous and varying regulatory requirements of such other countries regarding safety, efficacy, chemistry, manufacturing and controls, clinical studies, commercial sales, pricing, and distribution of our product candidates. Even if we are successful in obtaining approval in one jurisdiction, we cannot ensure that we will obtain approval in any other jurisdictions. If we are unable to obtain approval for our product candidates in multiple jurisdictions, our revenue and results of operations could be negatively affected.

The regulatory approval processes of the FDA and comparable foreign authorities are lengthy, time consuming, and inherently unpredictable. If we are ultimately unable to obtain regulatory approval for our product candidates, our business will be substantially harmed.

The time required to obtain approval by the FDA and comparable foreign authorities is unpredictable, typically takes many years following the commencement of clinical studies, and depends upon numerous factors. In addition, approval policies, regulations, or the type and amount of clinical data necessary to gain approval may change during the course of a product candidate's clinical development and may vary among jurisdictions, which may cause delays in the approval or the decision not to approve an application. We have not obtained regulatory approval for any product candidate, and it is possible that none of our existing product candidates or any product candidates we may seek to develop in the future will ever obtain regulatory approval.

Applications for our product candidates could fail to receive regulatory approval for many reasons, including but not limited to the following:

- the FDA or comparable foreign regulatory authorities may disagree with the design or implementation of our clinical studies;
- the population studied in the clinical program may not be sufficiently broad or representative to assure safety in the full population for which we seek approval;
- the FDA or comparable foreign regulatory authorities may disagree with our interpretation of data from nonclinical studies or clinical studies;
- the data collected from clinical studies of our product candidates may not be sufficient to support the submission of a new drug application, or NDA, or biologics license application, or BLA, or other submission or to obtain regulatory approval in the United States or elsewhere;
- we may be unable to demonstrate to the FDA or comparable foreign regulatory authorities that a product candidate's risk-benefit ratio for its proposed indication is acceptable;
- the FDA or comparable foreign regulatory authorities may fail to approve the manufacturing processes, test procedures and specifications, or facilities of third-party manufacturers with which we contract for clinical and commercial supplies; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient for approval.

This lengthy approval process, as well as the unpredictability of the results of clinical studies, may result in our failing to obtain regulatory approval to market any of our product candidates, which would significantly harm our business, results of operations, and prospects.

Clinical drug development involves a lengthy and expensive process with an uncertain outcome, and results of earlier studies may not be predictive of future study results.

Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the clinical study process. The results of preclinical studies and early clinical studies of our product candidates may not be predictive of the results of later-stage clinical studies. Product candidates that have shown promising results in early-stage clinical studies may still suffer significant setbacks in subsequent registration clinical studies. For example, the safety or efficacy results generated to date in clinical studies for KRN23, triheptanoin, and SA-ER do not ensure that later clinical studies will demonstrate similar results. There is a high failure rate for drugs and biologics proceeding through clinical studies, and product candidates in later stages of clinical studies may fail to show the desired safety and efficacy traits despite having progressed through preclinical studies and initial clinical studies. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical studies due to lack of efficacy or adverse safety profiles, notwithstanding promising results in earlier studies. Moreover, nonclinical and clinical data are often susceptible to varying interpretations and analyses. We do not know whether any Phase 2, Phase 3, or other clinical studies we may conduct will demonstrate consistent or adequate efficacy and safety sufficient to obtain regulatory approval to market our drug candidates.

We may find it difficult to enroll patients in our clinical studies given the limited number of patients who have the diseases for which our product candidates are being studied. Difficulty in enrolling patients could delay or prevent clinical studies of our product candidates.

Identifying and qualifying patients to participate in clinical studies of our product candidates is critical to our success. The timing of our clinical studies depends in part on the speed at which we can recruit patients to participate in testing our product candidates, and we may experience delays in our clinical studies if we encounter difficulties in enrollment.

Each of the conditions for which we plan to evaluate our current product candidates is a rare genetic disease. Accordingly, there are limited patient pools from which to draw for clinical studies. For our current product candidates:

- we estimate that several thousand patients in the United States suffer from XLH, for which KRN23 is being studied;
- we estimate that up to approximately 200 patients in the developed world may suffer from MPS 7, for which rhGUS is being studied;
- we estimate that several thousand patients in the United States suffer from LC-FAOD, for which triheptanoin is being studied;
- we estimate that several thousand patients in the United States suffer from Glut1 DS, for which triheptanoin is being studied; and
- we estimate that about 1,200 to 2,000 patients in the developed world suffer from HIBM, for which SA-ER is being studied.

In addition to the rarity of these diseases, the eligibility criteria of our clinical studies will further limit the pool of available study participants as we will require that patients have specific characteristics that we can measure or to assure their disease is either severe enough or not too advanced to include them in a study. Additionally, the process of finding and diagnosing patients may prove costly. We also may not be able to identify, recruit, and enroll a sufficient number of patients to complete our clinical studies because of the perceived risks and benefits of the product candidate under study, the availability and efficacy of competing therapies and clinical studies, the proximity and availability of clinical study sites for prospective patients, and the patient referral practices of physicians. If patients are unwilling to participate in our studies for any reason, the timeline for recruiting patients, conducting studies, and obtaining regulatory approval of potential products may be delayed.

If we experience delays in the completion of, or termination of, any clinical study of our product candidates, the commercial prospects of our product candidates will be harmed, and our ability to generate product revenue from any of these product candidates could be delayed or prevented. In addition, any delays in completing our clinical studies will increase our costs, slow down our product candidate development and approval process, and jeopardize our ability to commence product sales and generate revenue. Any of these occurrences may harm our business, financial condition, and prospects significantly. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical studies may also ultimately lead to the denial of regulatory approval of our product candidates.

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

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

- inability to generate sufficient preclinical, toxicology, or other *in vivo* or *in vitro* data to support the initiation of human clinical studies;
- delays in reaching a consensus with regulatory agencies on study design;
- delays in reaching agreement on acceptable terms with prospective contract research organizations, or CROs, and clinical study sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and clinical study sites;

- delays in obtaining required Institutional Review Board, or IRB, approval at each clinical study site;
- imposition of a clinical hold by regulatory agencies, after review of an investigational new drug, or IND, application or amendment, or equivalent application or amendment, or an inspection of our clinical study operations or study sites;
- delays in recruiting suitable patients to participate in our clinical studies;
- difficulty collaborating with patient groups and investigators;
- failure by our CROs, other third parties, or us to adhere to clinical study requirements;
- failure to perform in accordance with the FDA's good clinical practices requirements, or applicable regulatory guidelines in other countries;
- delays in having patients complete participation in a study or return for post-treatment follow-up;
- patients dropping out of a study;
- occurrence of adverse events associated with the product candidate that are viewed to outweigh its potential benefits;
- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols;
- the cost of clinical studies of our drug candidates being greater than we anticipate;
- clinical studies of our drug candidates producing negative or inconclusive results, which may result in us deciding, or regulators requiring us, to conduct additional clinical studies or abandon drug development programs; and
- delays in manufacturing, testing, releasing, validating, or importing/exporting sufficient stable quantities of our product candidates for use in clinical studies or the inability to do any of the foregoing.

Any inability to successfully complete nonclinical and clinical development could result in additional costs to us or impair our ability to generate revenue. In addition, if we make manufacturing or formulation changes to our product candidates, such as our plan to manufacture a combination extended release and immediate release version of sialic acid, we may need to conduct additional studies to bridge our modified product candidates to earlier versions. Clinical study delays could also shorten any periods during which our products have patent protection and may allow our competitors to bring products to market before we do, which could impair our ability to obtain orphan exclusivity and to successfully commercialize our product candidates and may harm our business and results of operations.

Our product candidates may cause undesirable side effects or have other properties that could delay or prevent their regulatory approval, limit the commercial profile of an approved label, or result in significant negative consequences following marketing approval, if any.

Undesirable side effects caused by our product candidates could cause us or regulatory authorities to interrupt, delay, or halt clinical studies and could result in a more restrictive label or the delay or denial of regulatory approval by the FDA or other comparable foreign authorities. Patients treated with KRN23 have experienced nausea, headache, elevated serum amylase, and back pain. Most of these adverse events were mild and no serious adverse events have been observed. Only single-dose Phase 1 data for KRN23 has been reported to date and other side effects may result from repeated dosing and/or longer-term exposure. Patients treated with triheptanoin have experienced drug-related side effects such as cramping, diarrhea, and loose stools. In addition, during a 13-year study of approximately 130 human subjects, including 65 with LC-FAOD, three serious adverse events were classified as possibly related to triheptanoin treatment (muscle cell rupture and elevated creatine kinase reported for two subjects and myoglobinuria in one subject); however, these serious adverse events can be considered typical of the underlying disease. While we have not initiated our own clinical studies for

triheptanoin, there may be other side effects associated with its use that we discover. Additionally, patients treated with SA-ER have experienced drug-related side effects including mild gastrointestinal discomfort. Enzyme replacement therapies have been associated with infusion-associated reactions due to a developing allergy to the product, which can cause rashes, pain, significant clinical disease, or even death. Our rhGUS and rhPPCA product candidates may also cause these or similar side effects when clinical trials are initiated. Results of our studies could reveal a high and unacceptable severity and prevalence of these or other side effects. In such an event, our studies could be suspended or terminated, and the FDA or comparable foreign regulatory authorities could order us to cease further development of or deny or withdraw approval of our product candidates for any or all targeted indications.

The drug-related side effects could affect patient recruitment, the ability of enrolled patients to complete the study, or result in potential product liability claims. We currently carry product liability insurance in the amount of $5.0 million in the aggregate, and we are required to maintain product liability insurance pursuant to certain of our license agreements. We believe our product liability insurance coverage is sufficient in light of our current clinical programs; however, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. A successful product liability claim or series of claims brought against us could cause our stock price to decline and, if judgments exceed our insurance coverage, could adversely affect our results of operations and business. In addition, regardless of merit or eventual outcome, product liability claims may result in impairment of our business reputation, withdrawal of clinical study participants, costs due to related litigation, distraction of management's attention from our primary business, initiation of investigations by regulators, substantial monetary awards to patients or other claimants, the inability to commercialize our product candidates, and decreased demand for our product candidates, if approved for commercial sale.

Additionally, if one or more of our product candidates receives marketing approval, and we or others later identify undesirable side effects caused by such products, a number of potentially significant negative consequences could result, including but not limited to:

- regulatory authorities may withdraw approvals of such product;
- regulatory authorities may require additional warnings on the label;
- we may be required to create a Risk Evaluation and Mitigation Strategy, or REMS, plan, which could include a medication guide outlining the risks of such side effects for distribution to patients, a communication plan for healthcare providers, and/or other elements to assure safe use;
- 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 the particular product candidate, if approved, and could significantly harm our business, results of operations, and prospects.

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

If our product candidates are approved, they will be subject to ongoing regulatory requirements for manufacturing, labeling, packaging, storage, advertising, promotion, sampling, record-keeping, conduct of post-marketing studies, and submission of safety, efficacy, and other post-market information, including both federal and state requirements in the United States and requirements of comparable foreign regulatory authorities.

Manufacturers and manufacturers' facilities are required to comply with extensive FDA, and comparable foreign regulatory authority, requirements, including ensuring that quality control and manufacturing procedures conform to current Good Manufacturing Practices, or cGMP, regulations. As such, we and our contract manufacturers will be subject to continual review and inspections to assess compliance with cGMP and adherence to commitments made in any NDA, BLA or marketing authorization application, or MAA. Accordingly, we and others with whom we work must continue to expend time, money, and effort in all areas of regulatory compliance, including manufacturing, production, and quality control.

Any regulatory approvals that we receive for our product candidates may be subject to 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 IV clinical trials, and surveillance to monitor the safety and efficacy of the product candidate. We will be required to report certain adverse reactions and production problems, if any, to the FDA and comparable foreign regulatory authorities. Any new legislation addressing drug safety issues could result in delays in product development or commercialization, or increased costs to assure compliance. We will have to comply with requirements concerning advertising and promotion for our products. Promotional communications with respect to prescription drugs are subject to a variety of legal and regulatory restrictions and must be consistent with the information in the product's approved label. As such, we may not promote our products for indications or uses for which they do not have approval. The holder of an approved NDA, BLA, or MAA must submit new or supplemental applications and obtain approval for certain changes to the approved product, product labeling, or manufacturing process. We could also be asked to conduct post-marketing clinical studies to verify the safety and efficacy of our products in general or in specific patient subsets. If original marketing approval were obtained via the accelerated approval pathway, we could be required to conduct a successful post-marketing clinical study to confirm clinical benefit for our products. An unsuccessful post-marketing study or failure to complete such a study could result in the withdrawal of marketing approval.

If a regulatory agency discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, or disagrees with the promotion, marketing or labeling of a product, such regulatory agency may impose restrictions on that product or us, including requiring withdrawal of the product from the market. If we fail to comply with applicable regulatory requirements, a regulatory agency or enforcement authority may, among other things:

- issue warning letters;
- impose civil or criminal penalties;
- suspend or withdraw regulatory approval;
- suspend any of our ongoing clinical studies;
- refuse to approve pending applications or supplements to approved applications submitted by us;
- impose restrictions on our operations, including closing our contract manufacturers' facilities; or
- seize or detain products, or require a product recall.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response, and could generate negative publicity. Any failure to comply with ongoing regulatory requirements may significantly and adversely affect our ability to commercialize and generate revenue from our products. If regulatory sanctions are applied or if regulatory approval is withdrawn, the value of our company and our operating results will be adversely affected.

Risks Related to our Reliance on Third Parties

We rely on third parties to conduct our nonclinical and clinical studies and perform other tasks for us. If these third parties do not successfully carry out their contractual duties, meet expected deadlines, or comply with regulatory requirements, we may not be able to obtain regulatory approval for or commercialize our product candidates and our business could be substantially harmed.

We have relied upon and plan to continue to rely upon third-party CROs to monitor and manage data for our ongoing nonclinical and clinical programs. We rely on these parties for execution of our nonclinical and clinical studies, and control only certain aspects of their activities. Nevertheless, we are responsible for ensuring that each of our 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. We and our CROs and other vendors are required to comply with cGMP, current good clinical practices, or cGCP, and Good Laboratory Practices, or

GLP, which are regulations and guidelines enforced by the FDA, the Competent Authorities of the Member States of the European Economic Area, or EEA, and comparable foreign regulatory authorities for all of our product candidates in clinical development. Regulatory authorities enforce these regulations through periodic inspections of study sponsors, principal investigators, study sites, and other contractors. If we or any of our CROs or vendors fail to comply with applicable regulations, the data generated in our nonclinical and clinical studies may be deemed unreliable and the FDA, EMA, or comparable foreign regulatory authorities may require us to perform additional nonclinical and clinical studies before approving our marketing applications. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical studies comply with cGCP regulations. In addition, our clinical studies must be conducted with product produced under cGMP regulations. Our failure to comply with these regulations may require us to repeat clinical studies, which would delay the regulatory approval process.

If any of our relationships with these third-party CROs terminate, we may not be able to enter into arrangements with alternative CROs or do so on commercially reasonable terms. In addition, our CROs are not our employees, and except for remedies available to us under our agreements with such CROs, we cannot control whether or not they devote sufficient time and resources to our on-going nonclinical and clinical programs. If CROs do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced or if the quality or accuracy of the data they obtain is compromised due to the failure to adhere to our protocols, regulatory requirements, or for other reasons, our clinical studies may be extended, delayed, or terminated and we may not be able to obtain regulatory approval for or successfully commercialize our product candidates. CROs may also generate higher costs than anticipated. As a result, our results of operations and the commercial prospects for our product candidates would be harmed, our costs could increase, and our ability to generate revenue could be delayed.

Switching or adding additional CROs involves additional cost and requires management time and focus. In addition, there is a natural transition period when a new CRO commences work. As a result, delays occur, which can materially impact our ability to meet our desired clinical development timelines. Though we carefully manage our relationships with our CROs, there can be no assurance that we will not encounter similar challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition, and prospects.

We are dependent on KHK for the development and commercialization of KRN23 in certain major markets, and KHK's failure to commercialize KRN23 in those markets would result in a material adverse effect on our business and operating results.

Under our agreement with KHK, KHK has the sole right to commercialize KRN23 in Europe and, at a specified time, in the United States and Canada subject to a limited promotion right retained by us. Our development partnership with KHK may not be successful, and we may not realize the expected benefits from such partnership, due to a number of important factors, including but not limited to the following:

- KHK has no obligation under our agreement to use diligent efforts to commercialize KRN23 in Europe. The timing and amount of any royalty payments we may receive under our agreement will depend on, among other things, the efforts, allocation of resources, and successful commercialization of KRN23 by KHK in Europe. Additionally, if KHK were to decide not to commercialize KRN23 in Europe, and we nevertheless wished to commercialize KRN23 in Europe, we would need to renegotiate with KHK certain terms of our agreement but may be unable to do so on reasonable terms, in a timely manner, or at all;
- the timing and amount of any royalty payments we may receive under our agreement with KHK will depend on, among other things, the efforts, allocation of resources, and successful commercialization of KRN23 by KHK in the United States and Canada under our agreement;
- KHK may change the focus of its commercialization efforts or pursue higher-priority programs;
- KHK may fail to manufacture or supply sufficient drug product of KRN23 for our development and clinical use, which could result in program delays;

- KHK may fail to manufacture or supply sufficient drug product of KRN23 for our commercial use, if approved, which could result in lost revenue;
- KHK may elect to develop and commercialize KRN23 indications with a larger market than XLH and at a lower price, thereby reducing the profit margin on sales of KRN23 for any orphan indications, including XLH;
- if KHK were to breach or terminate the agreement with us, we would no longer have any rights to develop or commercialize KRN23 or such rights would be limited to non-terminated countries;
- KHK may terminate its agreement with us, adversely impacting our potential revenue from licensed products; and
- the timing and amounts of expense reimbursement that we may receive are uncertain, and the total expenses for which we are obligated to reimburse KHK may be greater than anticipated.

We rely completely on third parties to manufacture our nonclinical and clinical drug supplies. Our business could be harmed if those third parties fail to provide us with sufficient quantities of drug product, or fail to do so at acceptable quality levels or prices.

We do not currently have, nor do we plan to acquire, the infrastructure or capability internally to manufacture our nonclinical and clinical drug supplies for use in the conduct of our clinical studies, and we lack the resources and the capability to manufacture any of our product candidates on a clinical or commercial scale. We rely on our manufacturers to purchase from third-party suppliers the materials necessary to produce our product candidates for our clinical studies. There are a limited number of suppliers for raw materials that we use to manufacture our drugs, and there may be a need to identify alternate suppliers to prevent a possible disruption of the manufacture of the materials necessary to produce our product candidates for our clinical studies, and, if approved, ultimately for commercial sale. We do not have any control over the process or timing of the acquisition of these raw materials by our manufacturers. Although we generally do not begin a clinical study unless we believe we have a sufficient supply of a product candidate to complete such study, any significant delay or discontinuity in the supply of a product candidate, or the raw material components thereof, for an ongoing clinical study due to the need to replace a third-party manufacturer could considerably delay completion of our clinical studies, product testing, and potential regulatory approval of our product candidates, which could harm our business and results of operations.

We are subject to a multitude of manufacturing risks, any of which could substantially increase our costs and limit supply of our product candidates.

The process of manufacturing our product candidates is complex, highly regulated, and subject to several risks, including but not limited to:

- the process of manufacturing our product candidates is extremely susceptible to product loss due to contamination, equipment failure or improper installation or operation of equipment, or vendor or operator error. Even minor deviations from normal manufacturing processes for any of our product candidates could result in reduced production yields, product defects, and other supply disruptions. If microbial, viral, or other contaminations are discovered in our product candidates or in the manufacturing facilities in which our product candidates are made, such manufacturing facilities may need to be closed for an extended period of time to investigate and remedy the contamination; and
- the manufacturing facilities in which our product candidates are made could be adversely affected by equipment failures, labor shortages, natural disasters, power failures, and numerous other factors.

Although we have not experienced any contaminations, equipment failures, or other similar manufacturing problems, any adverse developments affecting manufacturing operations for our product candidates may result in shipment delays, inventory shortages, lot failures, withdrawals or recalls, or other interruptions in the supply of

our product candidates. We may also have to take inventory write-offs and incur other charges and expenses for product candidates that fail to meet specifications, undertake costly remediation efforts, or seek more costly manufacturing alternatives.

The drug substance and drug product for our product candidates are currently acquired from single-source suppliers. The loss of these suppliers, or their failure to supply us with the drug substance or drug product, could materially and adversely affect our business.

The drug substance and drug product for KRN23 are made by KHK pursuant to our license and collaboration agreement with KHK. The drug substance and drug product for rhGUS are manufactured by Rentschler Biotechnologie GmbH under a development and clinical supply agreement and accompanying purchase orders. The pharmaceutical-grade drug substance for triheptanoin is manufactured by Cremer Oleo GmbH & Co. KG, or Cremer, pursuant to our supply agreement with Cremer, and the drug product for triheptanoin is prepared by Haupt Pharma AG pursuant to purchase orders. The drug substance for SA-ER is manufactured by Sanyo Fine Co., Ltd. under our license agreement and accompanying purchase orders with Nobelpharma Co., Ltd., and the drug product for SA-ER is manufactured by AAIPharma Services Corp., or AAIPharma, pursuant to our license agreement and accompanying purchase orders with AAIPharma. We do not currently have any other suppliers for the drug substance or drug product of our product candidates and, although we believe that there are alternate sources of supply that could satisfy our clinical and commercial requirements, we cannot assure you that identifying alternate sources and establishing relationships with such sources would not result in significant delay in the development of our product candidates. Additionally, we may not be able to enter into supply arrangements with alternative suppliers on commercially reasonable terms, or at all. A delay in the development of our product candidates or having to enter into a new agreement with a different third party on less favorable terms than we have with our current suppliers could have a material adverse impact upon on our business.

We and our collaborators and contract manufacturers are subject to significant regulation with respect to manufacturing our product candidates. The manufacturing facilities on which we rely may not continue to meet regulatory requirements or may not be able to meet supply demands.

All entities involved in the preparation of therapeutics for clinical studies or commercial sale, including our existing contract manufacturers for our product candidates, are subject to extensive regulation. Components of a finished therapeutic product approved for commercial sale or used in late-stage clinical studies must be manufactured in accordance with cGMP. These regulations govern manufacturing processes and procedures (including record keeping) and the implementation and operation of quality systems to control and assure the quality of investigational products and products approved for sale. Poor control of production processes can lead to the introduction of contaminants or to inadvertent changes in the properties or stability of our product candidates that may not be detectable in final product testing. We, our collaborators, or our contract manufacturers must supply all necessary documentation in support of an NDA, BLA, or MAA on a timely basis and must adhere to GLP and cGMP regulations enforced by the FDA and other regulatory agencies through their facilities inspection program. Some of our contract manufacturers have never produced a commercially approved pharmaceutical product and therefore have not obtained the requisite regulatory authority approvals to do so. The facilities and quality systems of some or all of our collaborators and third-party contractors must pass a pre-approval inspection for compliance with the applicable regulations as a condition of regulatory approval of our product candidates or any of our other potential products. In addition, the regulatory authorities may, at any time, audit or inspect a manufacturing facility involved with the preparation of our product candidates or our other potential products or the associated quality systems for compliance with the regulations applicable to the activities being conducted. Although we oversee the contract manufacturers, we cannot control the manufacturing process of, and are completely dependent on, our contract manufacturing partners for compliance with the regulatory requirements. If these facilities do not pass a pre-approval plant inspection, regulatory approval of the products may not be granted or may be substantially delayed until any violations are corrected to the satisfaction of the regulatory authority, if ever.

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

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

Additionally, if supply from one approved manufacturer is interrupted, an alternative manufacturer would need to be qualified through an NDA or BLA supplement or MAA variation, or equivalent foreign regulatory filing, which could result in further delay. The regulatory agencies may also require additional studies if a new manufacturer is relied upon for commercial production. Switching manufacturers may involve substantial costs and is likely to result in a delay in our desired clinical and commercial timelines.

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

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

Because we rely on third parties to develop and manufacture our product candidates, we must, at times, share trade secrets with them. We seek to protect our proprietary technology in part by entering into confidentiality agreements and, if applicable, material transfer agreements, collaborative research agreements, consulting agreements, or other similar agreements with our collaborators, advisors, employees, and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information, such as trade secrets. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are inadvertently incorporated into the technology of others, or are disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may have a material adverse effect on our business.

Risks Related to Commercialization of Our Product Candidates

If the market opportunities for our product candidates are smaller than we believe they are, our revenue may be adversely affected, and our business may suffer. Because the target patient populations of our product candidates are small, we must be able to successfully identify patients and acquire a significant market share to achieve profitability and growth.

We focus our research and product development on treatments for rare and ultra-rare genetic diseases. Given the small number of patients who have the diseases that we are targeting, it is critical to our ability to grow and become profitable that we continue to successfully identify patients with these rare and ultra-rare genetic diseases. Our projections of both the number of people who have these diseases, as well as the subset of people with these diseases who have the potential to benefit from treatment with our product candidates, are based on

our beliefs and estimates. These estimates have been derived from a variety of sources, including the scientific literature, surveys of clinics, patient foundations, or market research, and may prove to be incorrect. Further, new studies may change the estimated incidence or prevalence of these diseases. The number of patients may turn out to be lower than expected. The effort to identify patients with diseases we seek to treat is in early stages, and we cannot accurately predict the number of patients for whom treatment might be possible. Additionally, the potentially addressable patient population for each of our product candidates may be limited or may not be amenable to treatment with our product candidates, and new patients may become increasingly difficult to identify or gain access to, which would adversely affect our results of operations and our business. Further, even if we obtain significant market share for our product candidates, because the potential target populations are very small, we may never achieve profitability despite obtaining such significant market share.

We intend to rely on third-party manufacturers to produce our product candidates, but we have not entered into binding agreements with any such manufacturers to support commercialization. Additionally, these manufacturers do not have experience producing our product candidates at commercial levels and may not achieve the necessary regulatory approvals or produce our product candidates at the quality, quantities, locations, and timing needed to support commercialization.

We have not yet secured manufacturing capabilities for commercial quantities of our product candidates. Although we intend to rely on third-party manufacturers for commercialization, we have only entered into agreements with such manufacturers to support our clinical studies. We may be unable to negotiate binding agreements with the manufacturers to support our commercialization activities at commercially reasonable terms.

Manufacturers may not have the experience or ability to produce our product candidates at commercial levels. We may run into technical or scientific issues related to manufacturing or development that we may be unable to resolve in a timely manner or with available funds. We also have not completed all of the characterization and validation activities necessary for commercialization and regulatory approvals. If our manufacturing partners do not conduct all such necessary activities in accordance with applicable regulations, our commercialization efforts will be harmed.

Even if our third-party product manufacturers develop an acceptable manufacturing process, if such third-party manufacturers are unable to produce the necessary quantities of our product candidates, or in compliance with cGMP or other pertinent regulatory requirements, and within our planned timeframe and cost parameters, the development and sales of our products, if approved, may be materially harmed.

We face intense competition and rapid technological change and the possibility that our competitors may develop therapies that are similar, more advanced, or more effective than ours, which may adversely affect our financial condition and our ability to successfully commercialize our product candidates.

The biotechnology and pharmaceutical industries are intensely competitive and subject to rapid and significant technological change. We are currently aware of various existing therapies that may compete with our product candidates. For example, XLH is currently treated with oral phosphate and Vitamin D therapy, which may compete with KRN23. Furthermore, B. Braun Medical Inc., or B. Braun, has received orphan drug designation for triheptanoin in Europe for certain LC-FAOD indications and we believe that B. Braun is evaluating whether or not to initiate clinical development; triheptanoin is also available and is currently being studied in food-grade form, which may compete with our pharmaceutical-grade product. LC-FAOD is currently treated with diet therapy and medium-chain triglyceride oil, which may compete with triheptanoin. Glut1 DS is currently treated primarily with the ketogenic diet and anti-epileptic drugs, which may also compete with triheptanoin. Additionally, we are aware of a program at the National Institutes of Health, whose intellectual property rights are licensed to a company in New Zealand that is investigating the use of another metabolite in the sialic acid pathway, ManNAc, for the treatment of HIBM, which could compete with SA-ER. ManNAc may have a potential advantage over SA-ER in that it is not a charged molecule like sialic acid is, which might improve its distribution and uptake. Gene therapy and other approaches may also emerge for the treatment of any of the disease areas in which we focus.

We have competitors both in the United States and internationally, including major multinational pharmaceutical companies, specialty pharmaceutical companies, and biotechnology companies. Some of the pharmaceutical and biotechnology companies we expect to compete with include Shire, Sanofi, BioMarin, Alexion, and Roche, as well as other smaller companies or biotechnology startups and large multinational pharmaceutical companies. Many of our competitors have substantially greater financial, technical, and other resources, such as larger research and development staff and experienced marketing and manufacturing organizations. Additional mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated in our competitors. As a result, these companies may obtain regulatory approval more rapidly than we are able to and may be more effective in selling and marketing their products as well. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large, established companies. Competition may increase further as a result of advances in the commercial applicability of technologies and greater availability of capital for investment in these industries. Our competitors may succeed in developing, acquiring, or licensing on an exclusive basis, products that are more effective or less costly than any product candidate that we may develop, or achieve earlier patent protection, regulatory approval, product commercialization, and market penetration than we do. 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.

We currently have no marketing and sales organization. If we are unable to establish sales and marketing capabilities or enter into agreements with third parties to market and sell our product candidates, we may be unable to generate any revenue.

Although our employees may have sold other similar products in the past while employed at other companies, we as a company have no experience selling and marketing our product candidates and we currently have no marketing or sales organization. To successfully commercialize any products that may result from our development programs, we will need to develop these capabilities, either on our own or with others. If our product candidates receive regulatory approval, we intend to establish a sales and marketing organization with technical expertise and supporting distribution capabilities to commercialize our product candidates in major markets, which will be expensive, difficult, and time consuming. Any failure or delay in the development of our internal sales, marketing, and distribution capabilities would adversely impact the commercialization of our products.

Further, given our lack of prior experience in marketing and selling biopharmaceutical products, our initial estimate of the size of the required sales force may be materially more or less than the size of the sales force actually required to effectively commercialize our product candidates. As such, we may be required to hire substantially more sales representatives to adequately support the commercialization of our product candidates or we may incur excess costs as a result of hiring more sales representatives than necessary. With respect to certain geographical markets, we may enter into collaborations with other entities to utilize their local marketing and distribution capabilities, but we may be unable to enter into such agreements on favorable terms, if at all. If our future collaborators do not commit sufficient resources to commercialize our future products, if any, and we are unable to develop the necessary marketing capabilities on our own, we will be unable to generate sufficient product revenue to sustain our business. We may be competing with companies that currently have extensive and well-funded marketing and sales operations. 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.

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

Even with the requisite approvals from the FDA and comparable foreign regulatory authorities, the commercial success of our product candidates will depend in part on the medical community, patients, and third-party payors accepting our product candidates as medically useful, cost-effective, and safe. Any product that we bring to the market may not gain market acceptance by physicians, patients, third-party payors, and others in the

medical community. The degree of market acceptance of any of our product candidates, if approved for commercial sale, will depend on a number of factors, including:

- the efficacy of the product as demonstrated in clinical studies and potential advantages over competing treatments;
- the prevalence and severity of any side effects, including any limitations or warnings contained in a product's approved labeling;
- the clinical indications for which approval is granted;
- relative convenience and ease of administration;
- the cost of treatment, particularly in relation to competing treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the strength of marketing and distribution support and timing of market introduction of competitive products;
- publicity concerning our products or competing products and treatments; and
- sufficient third-party insurance coverage and reimbursement.

Even if a potential product displays a favorable efficacy and safety profile in nonclinical and clinical studies, market acceptance of the product will not be fully known until after it is launched. Our efforts to educate the medical community and third-party payors on the benefits of the product candidates may require significant resources and may never be successful. If our product candidates are approved but fail to achieve an adequate level of acceptance by physicians, patients, third-party payors, and others in the medical community, we will not be able to generate sufficient revenue to become or remain profitable.

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

Our target patient populations are small, and accordingly the pricing, coverage, and reimbursement of our product candidates, if approved, must be adequate to support our commercial infrastructure. Our per-patient prices must be sufficient to recover our development and manufacturing costs and potentially achieve profitability. Accordingly, the availability and adequacy of coverage and reimbursement by governmental and private payors are essential for most patients to be able to afford expensive treatments such as ours, assuming approval. 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 for by health maintenance, managed care, pharmacy benefit, and similar healthcare management organizations, or reimbursed by government authorities, private health insurers, and other third-party payors. If coverage and reimbursement are not available, or are available only to 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 high enough to allow us to establish or maintain pricing sufficient to realize a return on our investment.

There is significant uncertainty related to the insurance coverage and reimbursement of newly approved products. In the United States, the principal decisions about coverage and reimbursement for new drugs are typically made by the Centers for Medicare & Medicaid Services, or CMS, an agency within the U.S. Department of Health and Human Services, as CMS decides whether and to what extent a new drug will be covered and reimbursed under Medicare. Private payors tend to follow the coverage reimbursement policies established by CMS to a substantial degree. It is difficult to predict what CMS will decide with respect to reimbursement for products such as ours.

Outside the United States, international operations are generally subject to extensive governmental price controls and other market regulations, and we believe the increasing emphasis on cost-containment initiatives in

Europe, Canada, and other countries has and will continue to put pressure on the pricing and usage of our product candidates. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems. Other countries allow companies to fix their own prices for medicinal 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 revenue and profits.

Moreover, increasing efforts by governmental 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. We expect to experience pricing pressures in connection with the sale of any of our product candidates due to the trend toward managed healthcare, the increasing influence of health maintenance organizations, and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs and surgical procedures and other treatments, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products.

Risks Related to Our Intellectual Property

If we are unable to obtain and maintain effective patent rights for our product candidates or any future product candidates, we may not be able to compete effectively in our markets.

We rely upon a combination of patents, trade secret protection, and confidentiality agreements to protect the intellectual property related to our technologies and product candidates. Our success depends in large part on our and our licensors' ability to obtain and maintain patent and other intellectual property protection in the United States and in other countries with respect to our proprietary technology and products.

We have sought to protect our proprietary position by filing patent applications in the United States and abroad related to our novel technologies and products that are important to our business. This process is expensive and time consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. 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 and involves complex legal and factual questions for which legal principles remain unsolved. The patent applications that we own or in-license may fail to result in issued patents with claims that cover our product candidates in the United States or in other foreign countries. There is no assurance that all potentially relevant prior art relating to our patents and patent applications has been found, which can invalidate a patent or prevent a patent from issuing from a pending patent application. Even if patents do successfully issue, and even if such patents cover our product candidates, third parties may challenge their validity, enforceability, or scope, which may result in such patents being narrowed, found unenforceable or invalidated. Furthermore, even if they are unchallenged, our patents and patent applications may not adequately protect our intellectual property, provide exclusivity for our product candidates, or prevent others from designing around our claims. Any of these outcomes could impair our ability to prevent competition from third parties, which may have an adverse impact on our business.

We, independently or together with our licensors, have filed several patent applications covering various aspects of our product candidates. We cannot offer any assurances about which, if any, patents will issue, the breadth of any such patent or whether any issued patents will be found invalid and unenforceable or will be threatened by third parties. Any successful opposition to these patents or any other patents owned by or licensed to us after patent issuance could deprive us of rights necessary for the successful commercialization of any product candidates that we may develop. Further, if we encounter delays in regulatory approvals, the period of time during which we could market a product candidate under patent protection could be reduced.

Although we have a number of patents covering methods of use and certain compositions of matter, we do not have complete patent protection for our product candidates. For example, there is no patent coverage for

KRN23 in Latin America, where we have rights to commercialize the compound. Therefore, a competitor could develop the same or similar antibody as well as other approaches that target FGF23. Additionally, none of the current intellectual property relating to rhGUS covers composition of matter, and there are currently no patents that cover rhPPCA. Therefore, it is possible that a competitor could develop the same or similar enzyme with respect to rhGUS and/or rhPPCA, subject to any regulatory exclusivities. With respect to triheptanoin, although some of the patents relating to triheptanoin cover aspects of composition of matter, it is possible that a competitor could develop the same or similar molecule. With respect to SA-ER, none of the patents relating to SA-ER cover composition of matter. Therefore, it is possible that a competitor could develop the same or similar molecule. If we cannot obtain and maintain effective patent rights for our product candidates, we may not be able to compete effectively and our business and results of operations would be harmed.

We may not have sufficient patent terms to effectively protect our products and business.

Patents have a limited lifespan. In the United States, the natural expiration of a patent is generally 20 years after it is filed. Although various extensions may be available, the life of a patent, and the protection it affords, is limited. Even if patents covering our product candidates are obtained, once the patent life has expired for a product, we may be open to competition from generic medications.

While patent term extensions under the Hatch-Waxman Act in the United States and under supplementary protection certificates in Europe may be available to extend the patent exclusivity term for KRN23, rhGUS, triheptanoin, and SA-ER, we cannot provide any assurances that any such patent term extension will be obtained and, if so, for how long. In addition, upon issuance in the United States any patent term can be adjusted based on certain delays caused by the applicant(s) or the United States Patent and Trademark Office, or USPTO. For example, a patent term can be reduced based on certain delays caused by the patent applicant during patent prosecution. If we do not have sufficient patent terms or regulatory exclusivity to protect our products, our business and results of operations will be adversely affected.

Patent policy and rule changes could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents.

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. The laws of foreign countries may not protect our rights to the same extent as the laws of the United States. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. We therefore cannot be certain that we or our licensors were the first to make the invention claimed in our owned and licensed patents or pending applications, or that we or our licensor were the first to file for patent protection of such inventions. Assuming the other requirements for patentability are met, in the United States prior to March 15, 2013, the first to make the claimed invention is entitled to the patent, while outside the United States, the first to file a patent application is entitled to the patent. After March 15, 2013, under the Leahy-Smith America Invents Act, or the Leahy-Smith Act, enacted on September 16, 2011, the United States has moved to a first to file system. The Leahy-Smith Act also includes a number of significant changes that affect the way patent applications will be prosecuted and may also affect patent litigation. The effects of these changes are currently unclear as the USPTO must still implement various regulations, the courts have yet to address any of these provisions and the applicability of the act and new regulations on specific patents discussed herein have not been determined and would need to be reviewed. In general, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business and financial condition.

If we are unable to maintain effective proprietary rights for our product candidates or any future product candidates, we may not be able to compete effectively in our markets.

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. 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.

Although we expect all of our employees and consultants to assign their inventions to us, and all of our employees, consultants, advisors, and any third parties who have access to our proprietary know-how, information, or technology to enter into confidentiality agreements, we cannot provide any assurances that all such agreements have been duly executed or that our trade secrets and other confidential proprietary information will not be disclosed or that competitors will not otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques. Misappropriation or unauthorized disclosure of our trade secrets could impair our competitive position and may have a material adverse effect on our business. Additionally, if the steps taken to maintain our trade secrets are deemed inadequate, we may have insufficient recourse against third parties for misappropriating the trade secret.

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

Our commercial success depends in part on our avoiding infringement of the patents and proprietary rights of third parties. There have been many lawsuits and other proceedings involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries, including patent infringement lawsuits, interferences, oppositions, and reexamination proceedings before the USPTO and corresponding foreign patent offices. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we are developing product candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our product candidates may be subject to claims of infringement of the patent rights of third parties.

Third parties may assert that we are employing their proprietary technology without authorization. There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture, or methods for treatment related to the use or manufacture of our product candidates. We have conducted freedom to operate analyses with respect to only certain of our product candidates, and therefore we do not know whether there are any third-party patents that would impair our ability to commercialize these product candidates. We also cannot guarantee that any of our analyses are complete and thorough, nor can we be sure that we have identified each and every patent and pending application in the United States and abroad that is relevant or necessary to the commercialization of our product candidates. Because patent applications can take many years to issue, there may be currently pending patent applications that may later result in issued patents that our product candidates may infringe.

In addition, third parties may obtain patents in the future and claim that use of our technologies infringes upon these patents. If any third-party patents were held by a court of competent jurisdiction to cover aspects of our formulations, the manufacturing process of any of our product candidates, methods of use, any molecules formed during the manufacturing process or any final product itself, the holders of any such patents may be able to block our ability to commercialize such product candidate unless we obtained a license under the applicable patents, or until such patents expire or are finally determined to be invalid or unenforceable. Such a license may not be available on commercially reasonable terms, or at all.

Parties making claims against us may obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize one or more of our product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. In the event of a successful claim of infringement against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, pay royalties, redesign our infringing products or obtain one or more licenses from third parties, which may be impossible or require substantial time and monetary expenditure.

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

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

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

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

We may face competition from biosimilars, which may have a material adverse impact on the future commercial prospects of KRN23, rhGUS, and rhPPCA.

Even if we are successful in achieving regulatory approval to commercialize a product candidate faster than our competitors, we may face competition from biosimilars with respect to KRN23, rhGUS, and rhPPCA. In the United States, the Biologics Price Competition and Innovation Act of 2009 created an abbreviated approval pathway for biological products that are demonstrated to be "highly similar," or biosimilar, to or "interchangeable" with an FDA-approved biological product. This new pathway could allow competitors to reference data from innovative biological products 12 years after the time of approval of the innovative biological product. This data exclusivity does not prevent another company from developing a product that is highly similar to the innovative product, generating its own data, and seeking approval. Data exclusivity only assures that another company cannot rely upon the data within the innovator's application to support the biosimilar product's approval. In his proposed budget for fiscal year 2014, President Obama proposed to cut this 12-year period of exclusivity down to seven years. He also proposed to prohibit additional periods of exclusivity due to minor changes in product formulations, a practice often referred to as "evergreening." It is possible that Congress may take these or other measures to reduce or eliminate periods of exclusivity. The Biologics Price Competition and Innovation Act of 2009 is complex and only beginning to be interpreted and implemented by

the FDA. As a result, its ultimate impact, implementation, and meaning is subject to uncertainty. While it is uncertain when any such processes may be fully adopted by the FDA, any such processes could have a material adverse effect on the future commercial prospects for KRN23, rhGUS, and rhPPCA.

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

If competitors are able to obtain marketing approval for biosimilars referencing our products, our products may become subject to competition from such biosimilars, with the attendant competitive pressure and consequences.

Additional competitors could enter the market with generic versions of our small-molecule product candidates, which may result in a material decline in sales of triheptanoin and SA-ER.

Under the Hatch-Waxman Act, a pharmaceutical manufacturer may file an abbreviated new drug application, or ANDA, seeking approval of a generic copy of an approved innovator product. Under the Hatch-Waxman Act, a manufacturer may also submit an NDA under section 505(b)(2) that references the FDA's finding of safety and effectiveness of a previously approved drug. A 505(b)(2) NDA product may be for a new or improved version of the original innovator product. Innovative small molecule drugs may be eligible for certain periods of regulatory exclusivity (e.g., five years for new chemical entities, three years for changes to an approved drug requiring a new clinical study, seven years for orphan drugs), which preclude FDA approval (or in some circumstances, FDA filing and review of) an ANDA or 505(b)(2) NDA relying on the FDA's finding of safety and effectiveness for the innovative drug. In addition to the benefits of regulatory exclusivity, an innovator NDA holder may have patents claiming the active ingredient, product formulation or an approved use of the drug, which would be listed with the product in the FDA publication, "Approved Drug Products with Therapeutic Equivalence Evaluations," known as the "Orange Book." If there are patents listed in the Orange Book, a generic applicant that seeks to market its product before expiration of the patents must include in the ANDA or 505(b)(2) what is known as a "Paragraph IV certification," challenging the validity or enforceability of, or claiming non-infringement of, the listed patent or patents. Notice of the certification must be given to the innovator, too, and if within 45 days of receiving notice the innovator sues to protect its patents, approval of the ANDA is stayed for 30 months, or as lengthened or shortened by the court.

Accordingly, if triheptanoin and SA-ER are approved, competitors could file ANDAs for generic versions of triheptanoin and SA-ER, or 505(b)(2) NDAs that reference triheptanoin and SA-ER, respectively. If there are patents listed for triheptanoin and SA-ER in the Orange Book, those ANDAs and 505(b)(2) NDAs would be required to include a certification as to each listed patent indicating whether the ANDA applicant does or does not intend to challenge the patent. We cannot predict whether any patents issuing from our pending patent applications will be eligible for listing in the Orange Book, how any generic competitor would address such patents, whether we would sue on any such patents, or the outcome of any such suit.

We may not be successful in securing or maintaining proprietary patent protection for products and technologies we develop or license. Moreover, if any patents that are granted and listed in the Orange Book are successfully challenged by way of a Paragraph IV certification and subsequent litigation, the affected product could more immediately face generic competition and its sales would likely decline materially. Should sales decline, we may have to write off a portion or all of the intangible assets associated with the affected product and our results of operations and cash flows could be materially and adversely affected.

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

While we normally seek and gain the right to fully prosecute the patents relating to our product candidates, there may be times when patents relating to our product candidates are controlled by our licensors. This is the case with our agreement with KHK, who is primarily responsible for the prosecution of patents and patent applications licensed to us under the collaboration agreement. If KHK or any of our future licensing partners fail to appropriately prosecute and maintain patent protection for patents covering any of our product candidates, our ability to develop and commercialize those product candidates may be adversely affected and we may not be able to prevent competitors from making, using, and selling competing products. In addition, even where we now have the right to control patent prosecution of patents and patent applications we have licensed from third parties, we may still be adversely affected or prejudiced by actions or inactions of our licensors and their counsel that took place prior to us assuming control over patent prosecution.

If we fail to comply with our obligations in the agreements under which we license intellectual property and other rights from third parties or otherwise experience disruptions to our business relationships with our licensors, we could lose license rights that are important to our business.

We are a party to a number of intellectual property license agreements that are important to our business and expect to enter into additional license agreements in the future. Our existing license agreements impose, and we expect that future license agreements will impose, various diligence, milestone payment, royalty, and other obligations on us. If we fail to comply with our obligations under these agreements, or we are subject to a bankruptcy, we may be required to make certain payments to the licensor, we may lose the exclusivity of our license, or the licensor may have the right to terminate the license, in which event we would not be able to develop or market products covered by the license. Additionally, the milestone and other payments associated with these licenses will make it less profitable for us to develop our drug candidates. See “Business—License Agreements” for a description of our license agreements with KHK, Baylor Research Institute, Nobelpharma, AAIPharma, HIBM Research Group, St. Louis University and St. Jude Children’s Research Hospital, which includes a description of the termination provisions of these agreements.

In some cases, patent prosecution of our licensed technology is controlled solely by the licensor. If our licensors fail to obtain and maintain patent or other protection for the proprietary intellectual property we license from them, we could lose our rights to the intellectual property or our exclusivity with respect to those rights, and our competitors could market competing products using the intellectual property. In certain cases, we control the prosecution of patents resulting from licensed technology. In the event we breach any of our obligations related to such prosecution, we may incur significant liability to our licensing partners. Licensing of intellectual property is of critical importance to our business and involves complex legal, business, and scientific issues. Disputes may arise regarding intellectual property subject to a licensing agreement, including but not limited to:

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

If disputes over intellectual property and other rights 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.

Although we are not currently involved in any litigation, we may be involved in lawsuits to protect or enforce our patents or the patents of our licensors, which could be expensive, time consuming, and unsuccessful.

Competitors may infringe our patents or the patents of our licensors. Although we are not currently involved in any litigation, if we or one of our licensing partners were to 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 and/or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity and/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, or non-enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO, or made a misleading statement, during prosecution. The outcome following legal assertions of invalidity and unenforceability is unpredictable.

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

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

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

We employ individuals who 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 independent contractors do not use the proprietary information or know-how of others in their work for us, and we are not currently subject to any claims that our employees, consultants, or independent contractors have wrongfully used or disclosed confidential information of third parties, we may in the future be subject to such claims. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel, which could adversely impact our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

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

Although we are not currently experiencing any claims challenging the inventorship of our patents or ownership of our intellectual property, we may in the future be subject to claims that former employees, collaborators or other third parties have an interest in our patents or other intellectual property as an inventor or co-inventor. For example, we may have inventorship disputes arise from conflicting obligations of consultants or others who are involved in developing our product candidates. Litigation may be necessary to defend against these and other claims challenging inventorship. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on our business. Even if

we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

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

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biotechnology industry involves both technological and legal complexity. Therefore, obtaining and enforcing biotechnology patents is costly, time consuming, and inherently uncertain. In addition, the United States has recently enacted and is currently implementing wide-ranging patent reform legislation. Recent U.S. Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on future actions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future.

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 can be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Further, licensing partners such as KHK may not prosecute patents in certain jurisdictions in which we may obtain commercial rights, thereby precluding the possibility of later obtaining patent protection in these countries. 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 may also export infringing products to territories where we have patent protection, but enforcement is not as strong as that in the United States. These products may compete with our products and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets, and other intellectual property protection, particularly those relating to biotechnology products, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. Proceedings to enforce our patent rights in foreign jurisdictions, whether or not successful, 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.

Risks Related to Our Business Operations

Our future success depends in part on our ability to retain our Founder, President, and Chief Executive Officer and to attract, retain, and motivate other qualified personnel.

We are highly dependent on Emil D. Kakkis, M.D., Ph.D., our Founder, President, and Chief Executive Officer, the loss of whose services may adversely impact the achievement of our objectives. Dr. Kakkis could

leave our employment at any time, as he is an "at will" employee. Recruiting and retaining other qualified employees, consultants, and advisors for our business, including scientific and technical personnel, will also be critical to our success. There is currently a shortage of skilled personnel in our industry, which is likely to continue. As a result, competition for skilled personnel is intense and the turnover rate can be high. We may not be able to attract and retain personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for individuals with similar skill sets. In addition, failure to succeed in preclinical or clinical studies may make it more challenging to recruit and retain qualified personnel. The inability to recruit and retain qualified personnel, or the loss of the services of Dr. Kakkis, may impede the progress of our research, development, and commercialization objectives.

If we fail to obtain or maintain orphan drug exclusivity for our products, our competitors may sell products to treat the same conditions and our revenue will be reduced.

Our business strategy focuses on the development of drugs that are eligible for FDA and EU orphan drug designation. Under the Orphan Drug Act, the FDA may designate a product as an orphan drug if it is intended to treat a rare disease or condition, defined as a patient population of fewer than 200,000 in the United States, or a patient population greater than 200,000 in the United States where there is no reasonable expectation that the cost of developing the drug will be recovered from sales in the United States. In the European Union, the EMA's Committee for Orphan Medicinal Products, or COMP, 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, designation is granted for products intended for the diagnosis, prevention, or treatment of a life-threatening, seriously debilitating or serious and chronic condition 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 biological product or where there is no satisfactory method of diagnosis, prevention, or treatment, or, if such a method exists, the medicine must be of significant benefit to those affected by the condition.

In the United States, orphan drug designation entitles a party to financial incentives such as opportunities for grant funding towards clinical trial costs, tax advantages, and user-fee waivers. In addition, if a product receives the first FDA approval for the indication for which it has orphan designation, the product is entitled to orphan drug exclusivity, which means the FDA may not approve any other application to market the same drug for the same indication for a period of seven years, except in limited circumstances, such as a showing of clinical superiority over the product with orphan exclusivity or where the manufacturer is unable to assure sufficient product quantity. In the European Union, orphan drug designation entitles a party to financial incentives such as reduction of fees or fee waivers and ten years of market exclusivity following drug or biological product approval. This period may be reduced to six years if the orphan drug designation criteria are no longer met, including where it is shown that the product is sufficiently profitable not to justify maintenance of market exclusivity.

Because the extent and scope of patent protection for our products may in some cases be limited, orphan drug designation is especially important for our products for which orphan drug designation may be available. For eligible drugs, we plan to rely on the exclusivity period under the Orphan Drug Act to maintain a competitive position. If we do not obtain orphan drug exclusivity for our drug products and biologic products that do not have broad patent protection, our competitors may then sell the same drug to treat the same condition sooner than if we had obtained orphan drug exclusivity and our revenue will be reduced.

Even though we have orphan drug designation for KRN23 in the United States, and rhGUS and SA-ER in the United States and Europe, we may not be the first to obtain marketing approval for any particular orphan indication due to the uncertainties associated with developing pharmaceutical products. Further, even if we obtain orphan drug exclusivity for a product, that exclusivity may not effectively protect the product from competition because different drugs with different active moieties can be approved for the same condition. Even after an orphan drug is approved, the FDA or EMA can subsequently approve the same drug with the same active moiety for the same condition if the FDA or EMA concludes that the later drug is safer, more effective, or makes

a major contribution to patient care. Orphan drug designation neither shortens the development time or regulatory review time of a drug nor gives the drug any advantage in the regulatory review or approval process.

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

As of December 31, 2013, we had 59 full-time employees. As our development and commercialization plans and strategies develop, we expect to need additional managerial, operational, sales, marketing, financial, legal, and other resources. Our management may need to divert a disproportionate amount of its attention away from our day-to-day activities and devote a substantial amount of time to managing these growth activities. We may not be able to effectively manage the expansion of our operations, which may result in weaknesses in our infrastructure, operational mistakes, loss of business opportunities, loss of employees, and reduced productivity among remaining employees. Our expected growth could require significant capital expenditures and may divert financial resources from other projects, such as the development of additional product candidates. If our management is unable to effectively manage our growth, our expenses may increase more than expected, our ability to generate and/or grow revenue could be reduced and we may not be able to implement our business strategy. Our future financial performance and our ability to commercialize product candidates and compete effectively will depend, in part, on our ability to effectively manage any future growth.

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

Although a substantial amount of our effort will focus on the continued clinical testing, potential approval, and commercialization of our existing product candidates, the success of our business also depends upon our ability to identify, license, discover, develop, or commercialize additional product candidates. Research programs to identify new product candidates require substantial technical, financial, and human resources. We may focus our efforts and resources on potential programs or product candidates that ultimately prove to be unsuccessful. Our research programs or licensing efforts may fail to yield additional product candidates for clinical development and commercialization for a number of reasons, including but not limited to the following:

- our research or business development methodology or search criteria and process may be unsuccessful in identifying potential product candidates;
- we may not be able or willing to assemble sufficient resources to acquire or discover additional product candidates;
- our product candidates may not succeed in preclinical or clinical testing;
- our potential product candidates may be shown to have harmful side effects or may have other characteristics that may make the products unmarketable or unlikely to receive marketing approval;
- competitors may develop alternatives that render our product candidates obsolete or less attractive;
- product candidates we develop may be covered by third parties' patents or other exclusive rights;
- the market for a product candidate may change during our program so that such a product may become unreasonable to continue to develop;
- a product candidate may not be capable of being produced in commercial quantities at an acceptable cost, or at all; and
- a product candidate may not be accepted as safe and effective by patients, the medical community, or third-party payors.

If any of these events occur, we may be forced to abandon our development efforts for a program or programs, or we may not be able to identify, license, discover, develop, or commercialize additional product candidates, which would have a material adverse effect on our business and could potentially cause us to cease operations.

We will incur significant 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, we will incur significant legal, accounting, and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act, as well as rules subsequently implemented by the Securities and Exchange Commission, or SEC, and The NASDAQ Global Market have imposed various requirements on public companies. In July 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act, or the Dodd-Frank Act, was enacted. There are significant corporate governance and executive compensation related provisions in the Dodd-Frank Act that require the SEC to adopt additional rules and regulations in these areas such as "say on pay" and pay parity. Recent legislation permits smaller "emerging growth companies" to implement many of these requirements over a longer period and up to five years from the pricing of this offering. We intend to take advantage of this new legislation but cannot guarantee that we will not be required to implement these requirements sooner than budgeted or planned and thereby incur unexpected expenses. Stockholder activism, the current political environment, and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact the manner in which we operate our business in ways we cannot currently anticipate. 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 these rules and regulations to make it more difficult and more expensive for us to obtain director and officer liability insurance and we may be required to incur substantial costs to maintain our current levels of such coverage.

The Sarbanes-Oxley Act requires, among other things, that we maintain effective internal controls for financial reporting and disclosure controls and procedures. In particular, we will be required to perform system and process evaluation and testing of our internal controls over financial reporting to allow management to report, commencing in our annual report on Form 10-K for the year ending December 31, 2014, on the effectiveness of our internal controls over financial reporting, if then required by Section 404 of the Sarbanes-Oxley Act. Our testing may reveal deficiencies in our internal controls over financial reporting that are deemed to be material weaknesses. Our compliance with Section 404 will require that we incur substantial accounting expense and expend significant management efforts. We currently do not have an internal audit group, and we will need to hire additional accounting and financial staff with appropriate public company experience and technical accounting knowledge. Moreover, if we are not able to comply with the requirements of Section 404 in a timely manner or if we identify or our independent registered public accounting firm identifies deficiencies in our internal controls over financial reporting that are deemed to be material weaknesses, the market price of our stock could decline and we could be subject to sanctions or investigations by NASDAQ, the SEC, or other regulatory authorities, which would require additional financial and management resources.

New laws and regulations as well as changes to existing laws and regulations affecting public companies, including the provisions of the Sarbanes-Oxley Act and rules adopted by the SEC and by NASDAQ, would likely result in increased costs to us as we respond to their requirements.

Healthcare legislative reform measures may have a material adverse effect on our business and results of operations.

In the United States, there have been and continue to be a number of 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 Health Care Reform Law, was passed, which substantially changes the way health care is financed by both governmental and private insurers, and significantly impacts the U.S. pharmaceutical industry. The Health Care Reform Law, among other things, subjects biologic products to potential competition by lower-cost biosimilars, addresses a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted, or injected, increases the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extends the rebate program to individuals enrolled in Medicaid managed

care organizations, establishes annual fees and taxes on manufacturers of certain branded prescription drugs, and promotes a new Medicare Part D coverage gap discount program.

In addition, other legislative changes have been proposed and adopted in the United States since the Health Care Reform Law was enacted. On August 2, 2011, the Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. This includes aggregate reductions of Medicare payments to providers up to 2% per fiscal year. On January 2, 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, or the ATRA, which, among other things, delayed for another two months the budget cuts mandated by these sequestration provisions of the Budget Control Act of 2011. On March 1, 2013, the President signed an executive order implementing sequestration, and on April 1, 2013, the 2% Medicare payment reductions went into effect. 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 may be subject, directly or indirectly, to federal and state healthcare 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 may be directly, or indirectly through our customers, subject to various federal and state fraud and abuse laws, including, without limitation, the federal Anti-Kickback Statute, the federal False Claims Act, and physician sunshine laws and regulations. These laws may impact, among other things, our proposed sales, marketing, and education programs. In addition, we may be subject to patient privacy regulation by both the federal government and the states in which we conduct our business. The laws that may affect our ability to operate include:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons from knowingly and willfully soliciting, receiving, offering or paying remuneration, directly or indirectly, to induce, or in return for, the purchase or recommendation of an item or service reimbursable under a federal healthcare program, such as the Medicare and Medicaid programs;
- federal civil and criminal false claims laws and civil monetary penalty laws, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment from Medicare, Medicaid, or other third-party payors that are false or fraudulent;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created new federal criminal statutes that prohibit executing a scheme to defraud any healthcare benefit program and making false statements relating to healthcare matters;
- HIPAA, as amended by the Health Information Technology and Clinical Health Act, or HITECH, and its implementing regulations, which imposes certain requirements relating to the privacy, security, and transmission of individually identifiable health information;
- the federal physician sunshine requirements under the Health Care Reform Laws requires manufacturers of drugs, devices, biologics, and medical supplies to report annually to the U.S. Department of Health and Human Services information related to payments and other transfers of value to physicians, other healthcare providers, 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; and
- state law equivalents of each of the above federal laws, such as anti-kickback and false claims laws that may apply to items or services reimbursed by any third-party payor, including commercial insurers, state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary

compliance guidelines and the relevant compliance guidance promulgated by the federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; 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, and state 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.

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. In addition, recent health care reform legislation has strengthened these laws. For example, the Health Care Reform Law, among other things, amends the intent requirement of the federal anti-kickback and criminal healthcare fraud statutes. A person or entity no longer needs to have actual knowledge of this statute or specific intent to violate it. Moreover, the Health Care Reform Law provides that the government may assert that a claim including items or services resulting from a violation of the federal anti-kickback statute constitutes a false or fraudulent claim for purposes of the False Claims Act.

If our operations are found to be in violation of any of the laws described above or any other governmental 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, 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.

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

We currently have limited international operations, but our business strategy incorporates potentially significant international expansion, particularly in anticipation of approval of our product candidates. We plan to maintain sales representatives and conduct physician and patient association outreach activities, as well as clinical trials, outside of the United States. Doing business internationally involves a number of risks, including but not limited to:

- multiple, conflicting, and changing laws and regulations such as privacy regulations, tax laws, export and import restrictions, employment laws, regulatory requirements, and other governmental approvals, permits, and licenses;
- failure by us to obtain and maintain regulatory approvals for the use of our products in various countries;
- additional potentially relevant third-party patent rights;
- complexities and difficulties in obtaining protection and enforcing our intellectual property;
- difficulties in staffing and managing foreign operations;
- complexities associated with managing multiple payor reimbursement regimes, government payors, or patient self-pay systems;
- limits in our ability to penetrate international markets;
- financial risks, such as longer payment cycles, difficulty collecting accounts receivable, the impact of local and regional financial crises on demand and payment for our products, and exposure to foreign currency exchange rate fluctuations;
- natural disasters, political and economic instability, including wars, terrorism, and political unrest, outbreak of disease, boycotts, curtailment of trade, and other business restrictions;
- certain expenses including, among others, expenses for travel, translation, and insurance; and

- regulatory and compliance risks that relate to maintaining accurate information and control over sales and activities that may fall within the purview of the U.S. Foreign Corrupt Practices Act, or FCPA, its books and records provisions, or its anti-bribery provisions.

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

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could have a material adverse effect on the success of our business.

Our research and development activities and our third-party manufacturers' and suppliers' activities involve the controlled storage, use, and disposal of hazardous materials, including the components of our product candidates and other hazardous compounds. We and our manufacturers and suppliers are subject to laws and regulations governing the use, manufacture, storage, handling, and disposal of these hazardous materials. In some cases, these hazardous materials and various wastes resulting from their use are stored at our and our manufacturers' facilities pending their use and disposal. We cannot eliminate the risk of contamination, which could cause an interruption of our commercialization efforts, research and development efforts and business operations, environmental damage resulting in costly clean-up and liabilities under applicable laws and regulations governing the use, storage, handling, and disposal of these materials and specified waste products. Although we believe that the safety procedures utilized by us and our third-party manufacturers for handling and disposing of these materials generally comply with the standards prescribed by these laws and regulations, we cannot guarantee that this is the case or eliminate the risk of accidental contamination or injury from these materials. In such an event, we may be held liable for any resulting damages and such liability could exceed our resources and state or federal or other applicable authorities may curtail our use of certain materials and/or interrupt our business operations. Furthermore, environmental laws and regulations are complex, change frequently, and have tended to become more stringent. We cannot predict the impact of such changes and cannot be certain of our future compliance. We do not currently carry biological or hazardous waste insurance coverage.

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

Our corporate headquarters and laboratory are located in the San Francisco Bay Area, and our collaboration partner for KRN23, KHK, is located in Japan, which have both in the past experienced severe earthquakes and other natural disasters. We do not carry earthquake insurance. Earthquakes or other natural disasters could severely disrupt our operations or those of our collaborators, and have a material adverse effect on our business, results of operations, financial condition, and prospects. If a natural disaster, power outage, or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure (such as the manufacturing facilities of our third-party contract manufacturers) or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place currently are limited and are unlikely to prove adequate in the event of a serious disaster or similar event. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which, particularly when taken together with our lack of earthquake insurance, could have a material adverse effect on our business.

Risks Related to this Offering and Ownership of Our Common Stock

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

Prior to this offering, there has not been a public market for our common stock. An active trading market for our common stock may not develop following this offering. You may not be able to sell your shares quickly or at

the market price if trading in our common stock is not active. The initial public offering price for the shares will be determined by negotiations between us and the representative of the underwriters and may not be indicative of prices that will prevail in the trading market.

The market price of our common stock is likely to be volatile. Our stock price could be subject to wide fluctuations in response to a variety of factors, including but not limited to the following:

- adverse results or delays in preclinical or clinical studies;
- any inability to obtain additional funding;
- any delay in filing an IND, NDA, BLA, or other regulatory submission for any of our product candidates and any adverse development or perceived adverse development with respect to the applicable regulatory agency's review of that IND, NDA, BLA, or other regulatory submission;
- the perception of limited market sizes or pricing for our product candidates;
- failure to successfully develop and commercialize our product candidates;
- post-marketing safety issues;
- failure to maintain our existing strategic collaborations or enter into new collaborations;
- failure by us or our licensors and strategic collaboration partners to prosecute, maintain, or enforce our intellectual property rights;
- changes in laws or regulations applicable to our products;
- any inability to obtain adequate product supply for our product candidates or the inability to do so at acceptable prices;
- adverse regulatory decisions;
- introduction of new products, services, or technologies by our competitors;
- failure to meet or exceed financial projections we may provide to the public;
- failure to meet or exceed the financial projections of the investment community;
- the perception of the pharmaceutical industry by the public, legislatures, regulators, and the investment community;
- announcements of significant acquisitions, strategic partnerships, joint ventures, or capital commitments by us, our strategic collaboration partner, or our competitors;
- disputes or other developments relating to proprietary rights, including patents, litigation matters, and our ability to obtain patent protection for our technologies;
- additions or departures of key scientific or management personnel;
- significant lawsuits, including patent or stockholder litigation;
- if securities or industry analysts do not publish research or reports about our business, or if they issue an adverse or misleading opinion regarding our stock;
- changes in the market valuations of similar companies;
- general market or macroeconomic conditions;
- sales of our common stock by us or our stockholders in the future; and
- trading volume of our common stock.

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

Our principal stockholders and management own a significant percentage of our stock and will be able to exert significant control over matters subject to stockholder approval.

As of January 10, 2014, our executive officers, directors, five percent stockholders, and their affiliates beneficially owned approximately 73% of our voting stock and, upon closing of this offering, that same group will beneficially own approximately 60% of our outstanding voting stock (assuming no exercise of the underwriters' option to purchase additional shares and no exercise of outstanding options and warrants and no purchasing of shares by such persons in the directed share program). Therefore, even after this offering, these stockholders will have the ability to influence us through their ownership positions, which may prevent or discourage unsolicited acquisition proposals or offers for our common stock that you may believe are in your best interest as one of our stockholders.

We are an "emerging growth company" and, due to the reduced reporting requirements applicable to emerging growth companies, certain investors may find investing in our common stock less attractive.

We are an "emerging growth company," as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies, including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. We could be an emerging growth company for up to five years, although circumstances could cause us to lose that status earlier, including if the market value of our common stock held by non-affiliates exceeds $700.0 million as of any June 30 before that time or if we have total annual gross revenue of $1.0 billion or more during any fiscal year before that time, in which cases we would no longer be an emerging growth company as of the following December 31 or, if we issue more than $1.0 billion in non-convertible debt during any three-year period before that time, we would cease to be an emerging growth company immediately. We cannot predict if investors will find our common stock less attractive because we may rely on this exemption. 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.

If you purchase our common stock in this offering, you will incur immediate and substantial dilution in the book value of your shares.

Investors purchasing shares of common stock in this offering will pay a price per share that substantially exceeds the pro forma book value per share of our tangible assets after subtracting our liabilities and the preferred stock dividend that we will pay concurrent with this offering. As a result, investors purchasing shares of common stock in this offering will incur immediate dilution of $11.09 per share, based on an assumed initial public offering price of $15.50 per share, the midpoint of the price range set forth on the cover of this prospectus, and our pro forma net tangible book value as of September 30, 2013. For information on how the foregoing amounts were calculated, see "Dilution."

This dilution is due to the substantially lower price paid by our investors who purchased shares prior to this offering as compared to the price offered to the public in this offering, and the exercise of stock options granted to our employees. In addition, as of September 30, 2013, we had outstanding options and warrants to purchase 1,854,625 shares of our capital stock; the exercise of any of these options or warrants would result in additional dilution. As a result of the dilution to investors purchasing shares in this offering, investors may receive significantly less than the purchase price paid in this offering, if anything, in the event of our liquidation.

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 September 30, 2013, upon the closing of this offering we will have outstanding a total of 28,140,212 shares of common stock, assuming no exercise of the underwriters' option to purchase additional shares. Of these shares, as of the date of this prospectus, approximately 4,838,710 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 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 September 30, 2013, up to an additional 23.3 million shares of common stock will be eligible for sale in the public market, of which approximately 17.0 million shares are held by directors, executive officers and other affiliates and will be subject to the manner of sale, volume limitations, and public reporting requirements of Rule 144 under the Securities Act of 1933, as amended, or the Securities Act. J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC, 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.

In addition, as of September 30, 2013, approximately 4.1 million 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 19.6 million shares of our common stock, or 19.9 million including the shares underlying outstanding warrants, 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 material adverse effect on the market price of our common stock.

Future sales and issuances of our common stock or rights to purchase common stock, including pursuant to our equity incentive plans, could result in additional dilution of the percentage ownership of our stockholders and could cause our stock price to fall.

We will need additional capital in the future to continue our planned operations. To the extent we raise additional capital by issuing equity securities, our stockholders may experience substantial dilution. We may sell common stock, convertible securities, or other equity securities in one or more transactions at prices and in a manner we determine from time to time. If we sell common stock, convertible securities, or other equity securities in more than one transaction, investors may be materially diluted by subsequent sales. These sales may also result in material dilution to our existing stockholders, and new investors could gain rights superior to our existing stockholders.

Pursuant to our 2014 Incentive Plan, or the 2014 Plan, which will become effective immediately prior to the completion of this offering, our management is authorized to grant stock options and other equity-based awards to our employees, directors, and consultants. An aggregate of 2,250,000 shares will be available for issuance under the 2014 Plan. The number of shares available for future grant under the 2014 Plan will automatically increase on January 1 of each year by up to the least of 2,500,000 shares and 4% of all shares of our capital stock outstanding as of December 31 of the prior calendar year, subject to the ability of our compensation committee to take action to reduce the size of the increase in any given year. Currently, we plan to register the increased number of shares available for issuance under the 2014 Plan each year. Pursuant to our 2014 Employee Stock Purchase Plan, or 2014 ESPP, which will become effective immediately prior to the completion of this offering, eligible employees will be able to acquire shares of our common stock at a discount to the prevailing market price, and an aggregate of 600,000 shares will be available for issuance under the 2014 ESPP. The number of shares available for issuance under the 2014 ESPP will automatically increase on January 1 of each year by up to

the least of 1,200,000 shares and 1% of all shares of our capital stock outstanding as of December 31 of the prior calendar year, subject to the ability of our compensation committee to take action to reduce the size of the increase in any given year. If our board of directors elects to increase the number of shares available for future grant under the 2014 Plan or the 2014 ESPP, our stockholders may experience additional dilution, which could cause our stock price to fall.

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

Our management will have broad discretion in the application of the net proceeds from this offering, including for any of the purposes described in the section entitled "Use of proceeds," and you will not have the opportunity as part of your investment decision to assess whether the net proceeds are being used appropriately. Because of the number and variability of factors that will determine our use of the net proceeds from this offering, their ultimate use may vary from their currently intended use. The failure by our management to apply these funds effectively could harm our business. Pending their use, we may invest the net proceeds from this offering in investment-grade, interest-bearing securities. These investments may not yield a favorable return to our stockholders.

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

We have incurred substantial losses during our history and do not expect to become profitable in the near future and we may never achieve profitability. To the extent that we continue to generate taxable losses, unused losses will carry forward to offset future taxable income, if any, until such unused losses expire. Under Sections 382 and 383 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 its equity ownership over a three-year period, the corporation's ability to use its pre-change net operating loss carryforwards, or NOLs, and other pre-change tax attributes (such as research tax credits) to offset its post-change income may be limited. We may experience ownership changes in the future as a result of subsequent shifts in our stock ownership. As a result, if we earn net taxable income, our ability to use our pre-change net operating loss carryforwards to offset U.S. federal taxable income may be subject to limitations, which could potentially result in increased future tax liability to us. In addition, at the state level, there may be periods during which the use of NOLs is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed.

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

We have never declared or paid any cash dividends on our common stock. Although we will pay a cash dividend to our existing holders of preferred stock, which was agreed to at the time of the private placement financings, in connection with the consummation of this offering, we currently anticipate that we will retain future earnings for the development, operation, and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. Any return to stockholders will therefore be limited to the appreciation of their stock.

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

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

- authorize "blank check" preferred stock, which could be issued by our board of directors without stockholder approval and may contain voting, liquidation, dividend, and other rights superior to our common stock;

- create a classified board of directors whose members serve staggered three-year terms;
- specify that special meetings of our stockholders can be called only by our board of directors or the chairperson of our board of directors;
- prohibit stockholder action by written consent;
- establish an advance notice procedure for stockholder approvals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to our board of directors;
- provide that our directors may be removed only for cause;
- provide that vacancies on our board of directors may be filled only by a majority of directors then in office, even though less than a quorum;
- specify that no stockholder is permitted to cumulate votes at any election of directors;
- expressly authorize our board of directors to modify, alter or repeal our amended and restated by-laws; and
- require holders of 75% of our outstanding common stock to amend specified provisions of our amended and restated certificate of incorporation and amended and restated by-laws.

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

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

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

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements that involve risks and uncertainties. All statements other than statements of historical facts contained in this prospectus are forward-looking statements. In some cases, you can identify forward-looking statements by words such as "anticipate," "believe," "contemplate," "continue," "could," "estimate," "expect," "intend," "may," "plan," "potential," "predict," "project," "seek," "should," "target," "will," "would," or the negative of these words or other comparable terminology. These forward-looking statements include, but are not limited to, statements about:

- our expectations regarding the timing of reporting results from our clinical studies of rhGUS, triheptanoin and SA-ER;
- our expectations regarding the timing of commencing clinical studies with respect to KRN23, rhPPCA, and triheptanoin;
- the likelihood of regulatory approvals for our product candidates;
- the potential market opportunities for commercializing our product candidates;
- our expectations regarding the potential market size and the size of the patient populations for our product candidates, if approved for commercial use;
- estimates of our expenses, future revenue, capital requirements, and our needs for additional financing;
- our ability to develop, acquire, and advance product candidates into, and successfully complete, clinical studies;
- the implementation of our business model and strategic plans for our business and product candidates;
- the initiation, timing, progress, and results of future preclinical studies and clinical studies, and our research and development programs;
- the scope of protection we are able to establish and maintain for intellectual property rights covering our product candidates;
- our ability to maintain and establish collaborations or obtain additional funding;
- our expectations regarding the time during which we will be an emerging growth company under the JOBS Act;
- our expectations regarding the composition of our board of directors;
- our use of proceeds from this offering;
- our financial performance; and
- developments and projections relating to our competitors and our industry.

Any forward-looking statements in this prospectus reflect our current views with respect to future events or to our future financial performance and involve known and unknown risks, uncertainties, and other factors that may cause our actual results, performance, or achievements to be materially different from any future results, performance, or achievements expressed or implied by these forward-looking statements. Factors that may cause actual results to differ materially from current expectations include, among other things, those listed under "Risk Factors" and elsewhere in this prospectus. Given these uncertainties, you should not place undue reliance on these forward-looking statements. Except as required by law, we assume no obligation to update or revise these forward-looking statements for any reason, even if new information becomes available in the future.

This prospectus also contains estimates, projections, and other information concerning our industry, our business, and the markets for certain diseases, including data regarding the estimated size of those markets, and the incidence and prevalence of certain medical conditions. Information that is based on estimates, forecasts, projections, market research, or similar methodologies is inherently subject to uncertainties and actual events or circumstances may differ materially from events and circumstances reflected in this information. Unless otherwise expressly stated, we obtained this industry, business, market, and other data from reports, research surveys, studies, and similar data prepared by market research firms and other third parties, industry, medical and general publications, government data, and similar sources.

USE OF PROCEEDS

We estimate that the net proceeds from the sale of 4,838,710 shares of common stock in this offering will be approximately $66.8 million at an assumed initial public offering price of $15.50 per share, the midpoint of the price range set forth on the cover of this prospectus, 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, we estimate that the net proceeds will be approximately $77.2 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 $15.50 per share would increase (decrease) our net proceeds by $4.5 million, assuming the number of shares offered by us, as set forth on the cover of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. We may also increase or decrease the number of shares we are offering. An increase (decrease) of 1,000,000 in the number of shares we are offering would increase (decrease) the net proceeds to us from this offering, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, by approximately $14.4 million, assuming the assumed initial public offering price stays the same.

We are undertaking this offering in order to access the public capital markets and to increase our liquidity. As of September 30, 2013, we had cash, cash equivalents and marketable securities of approximately $63.7 million. We intend to use the net proceeds of this offering, together with our existing cash, cash equivalents and marketable securities, as follows:

- Approximately $9 million to advance our ongoing clinical program for KRN23, net of cost-share reimbursement from our partner KHK;
- Approximately $23 million to advance our ongoing clinical program for rhGUS;
- Approximately $41 million to advance our ongoing clinical program for triheptanoin in both LC-FAOD and Glut1 DS;
- Approximately $15 million to advance our ongoing clinical program for SA-ER;
- Approximately $4.1 million as a cash dividend to the holders of our preferred stock payable upon conversion of the preferred stock to common stock; and
- The remainder for preclinical research, working capital, and other general corporate purposes.

Our expected use of net proceeds from this offering represents our current intentions based upon our present plans and business condition. As of the date of this prospectus, we cannot predict with complete certainty all of the particular uses for the net proceeds to be received upon the completion of this offering or the actual amounts that we will spend on the uses set forth above. We may also use a portion of the net proceeds to in-license, acquire, or invest in additional businesses, technologies, products, or assets. Although we have no specific agreements, commitments, or understandings with respect to any in-license or acquisition, we evaluate such opportunities and engage in related discussions with other companies from time to time. Due to the many variables inherent to the development of our product candidates, we cannot currently predict the stage of development we expect the net proceeds of this offering to achieve for our clinical studies and product candidates.

The amount and timing of our actual expenditures will depend upon numerous factors, including the results of our research and development efforts, the timing and success of preclinical studies, our ongoing clinical studies or clinical studies we may commence in the future and the timing of regulatory submissions. As a result, our management will have broad discretion over the use of the net proceeds from this offering.

Pending the use of the proceeds from this offering, we intend to invest the net proceeds in interest-bearing, investment-grade securities, certificates of deposit, or government securities.

DIVIDEND POLICY

We have never declared or paid cash dividends on our common stock. Although we will pay a cash dividend to our existing holders of preferred stock, which was agreed to at the time of the private placement financings, in connection with the consummation of this offering, 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 on our common stock in the foreseeable future. Any future determination to pay dividends will be made at the discretion of our board of directors or any authorized committee thereof.

CAPITALIZATION

The following table sets forth our cash, cash equivalents and marketable securities and capitalization as of September 30, 2013:

- on an actual basis;
- on a pro forma basis to reflect (i) the conversion of all outstanding shares of our convertible preferred stock into an aggregate of 19,598,486 shares of our common stock, (ii) the reclassification to additional paid-in capital of our preferred stock warrant liability in connection with the conversion of our outstanding preferred stock warrants into common stock warrants, and (iii) the accrual of a dividend of $4.1 million which is payable concurrent with the conversion of our preferred stock to common stock to the holders of our preferred stock, which has been calculated as if the conversion of preferred stock into common stock occurred as of January 17, 2014, in each case, immediately prior to the completion of this offering; and
- on a pro forma as adjusted basis to additionally reflect (i) the issuance and sale of 4,838,710 shares of common stock in this offering at an assumed initial public offering price of $15.50 per share, the midpoint of the price range set forth on the cover of this prospectus, after deducting the estimated underwriting discount and commissions and estimated offering expenses payable by us and (ii) the payment of the $4.1 million dividend payable described above.

You should read this information together with our audited financial statements and related notes appearing elsewhere in this prospectus and the information set forth under the heading “Selected Financial Data” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.”

	As of September 30, 2013		
	Actual	Pro Forma	Pro Forma as Adjusted
		(in thousands, except share and per share data) (unaudited)	
Cash, cash equivalents and marketable securities	$ 63,657	$ 63,657	$ 126,262
Preferred stock warrant liability	$ 1,596	—	—
Convertible preferred stock, par value $0.001 per share: 62,459,236 shares authorized, 61,431,574 shares issued and outstanding, actual; no shares authorized, issued and outstanding, pro forma and pro forma as adjusted	118,002	—	—
Stockholders’ deficit:			
Preferred stock, par value $0.001 per share: no shares authorized, issued or outstanding, actual; 25,000,000 shares authorized and no shares issued or outstanding, pro forma and pro forma as adjusted	—	—	—
Common stock, par value $0.001 per share: 85,000,000 shares authorized, 3,703,016 shares issued and outstanding, actual; 250,000,000 shares authorized, 23,301,502 shares issued and outstanding pro forma, and 28,140,212 shares issued and outstanding, pro forma as adjusted	4	23	28
Additional paid-in capital	8	115,442	182,187
Accumulated other comprehensive loss	(14)	(14)	(14)
Deficit accumulated during the development stage	(56,846)	(56,846)	(56,846)
Total stockholders’ (deficit) equity	(56,848)	58,605	125,355
Total capitalization	$ 62,750	$ 58,605	$ 125,355

Each $1.00 increase (decrease) in the assumed initial public offering price of $15.50 per share, the midpoint of the price range set forth on the cover of this prospectus, would increase (decrease) each of pro forma as adjusted cash, cash equivalents and marketable securities, additional paid-in capital, total stockholders’ equity, and total capitalization by approximately $4.5 million, assuming that the number of shares offered by us, as set

forth on the cover of this prospectus, remains the same. We may also increase or decrease the number of shares we are offering. An increase (decrease) of 1,000,000 in the number of shares we are offering would increase (decrease) each of pro forma as adjusted cash, cash equivalents and marketable securities, additional paid-in capital, total stockholders' equity, and total capitalization by approximately $14.4 million, assuming the assumed initial public offering price per share, as set forth on the cover of this prospectus, remains the same. The pro forma as adjusted information is illustrative only, and we will adjust this information based on the actual initial public offering price and other terms of this offering determined at pricing.

The number of shares of common stock issued and outstanding in the table above excludes the following shares as of September 30, 2013:

- 1,526,772 shares of common stock issuable upon the exercise of outstanding stock options having a weighted-average exercise price of $0.86 per share;
- 327,853 shares of common stock issuable upon the exercise of outstanding warrants having a weighted-average exercise price $3.241 per share;
- 1,565,352 shares of common stock reserved for issuance pursuant to future equity awards under our 2011 Equity Incentive Plan, as amended, which will become available for issuance under our 2014 Incentive Plan after completion of this offering;
- 2,250,000 shares of common stock reserved for issuance (including the above-referenced shares reserved for issuance under our 2011 Equity Incentive Plan, as amended) pursuant to future equity awards under our 2014 Incentive Plan, as well as any future increases in the number of shares of our common stock reserved for future issuance under this plan, which will become effective immediately prior to the completion of this offering; and
- 600,000 shares of common stock reserved for future issuance under our 2014 Employee Stock Purchase Plan, or 2014 ESPP, as well as any future increases in the number of shares of our common stock reserved for future issuance under the 2014 ESPP, 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 assumed 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 as of September 30, 2013 was $(58.2) million, or $(15.72) per share. Our pro forma net tangible book value as of September 30, 2013 was $57.2 million, or $2.46 per share, based on the total number of shares of our common stock outstanding as of September 30, 2013. Pro forma net tangible book value, before the issuance and sale of shares in this offering, gives effect to:

- the conversion of all outstanding shares of our convertible preferred stock into an aggregate of 19,598,486 shares of our common stock;
- the reclassification to additional paid-in capital of our preferred stock warrant liability in connection with the conversion of our outstanding preferred stock warrants into common stock warrants; and
- a $4.1 million dividend payable concurrent with the conversion of the convertible preferred stock, which has been calculated as if the conversion of preferred stock into common stock occurred on January 17, 2014.

Dilution per share to new investors represents the difference between the amount per share paid by purchasers of shares of common stock in this offering and the pro forma as adjusted net tangible book value per share of common stock immediately after completion of this offering. After giving effect to our sale of shares of common stock in this offering at an assumed initial public offering price of $15.50 per share, the midpoint of the price range set forth on the cover of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, and the payment of the $4.1 million dividend payable, our pro forma as adjusted net tangible book value as of September 30, 2013 would have been $124.0 million, or $4.41 per share. This represents an immediate increase in pro forma net tangible book value of $1.95 per share to existing stockholders and an immediate dilution of $11.09 per share to investors participating in this offering, as illustrated in the following table:

Assumed initial public offering price per share		$15.50
Historical net tangible book value per share as of September 30, 2013	$(15.72)	
Pro forma increase in net tangible book value per share as of September 30, 2013	18.18	
Pro forma net tangible book value per share as of September 30, 2013	2.46	
Increase in pro forma net tangible book value per share attributable to new investors	1.95	
Pro forma as adjusted net tangible book value per share after this offering		4.41
Dilution per share to investors participating in this offering		$11.09

Each $1.00 increase (decrease) in the assumed public offering price of $15.50 per share, the midpoint of the price range set forth on the cover of this prospectus, would increase (decrease) our pro forma as adjusted net tangible book value by $4.5 million, or $0.16 per share, and the dilution per share to investors in this offering by $0.84, assuming that the number of shares offered by us, as set forth on the cover of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. We may also increase or decrease the number of shares we are offering. An increase (decrease) of 1,000,000 in the number of shares we are offering would increase (decrease) our pro forma as adjusted net tangible book value as of September 30, 2013 after this offering by approximately $14.4 million, or approximately $0.34 per share, and would decrease (increase) dilution per share to investors in this offering by approximately $0.34, assuming the assumed initial public offering price per share remains the same, after

deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. The pro forma as adjusted information is illustrative only, and we will adjust this information based on the actual initial public offering price and other terms of this offering determined at pricing.

If the underwriters' option to purchase additional shares from us is exercised in full, the pro forma as adjusted net tangible book value per share after this offering would be $4.66 per share, the increase in pro forma net tangible book value per share to existing stockholders would be $2.20 per share and the dilution to investors participating in this offering would be $10.84 per share.

The following table presents, on a pro forma as adjusted basis described above, the differences between the existing stockholders and the purchasers of shares in this offering with respect to the number of shares purchased from us, the total consideration paid, which includes net proceeds received from the issuance of common and convertible preferred stock, cash received from the exercise of stock options and warrants, and the value of any stock issued for services and the average price paid per share (in thousands, except per share amounts and percentages):

	Shares Purchased		Total Consideration		Average Price per Share
	Number	Percent	Amount	Percent	
Existing stockholders	23,301,502	83%	$109,030	59%	$ 4.68
New investors	4,838,710	17	75,000	41	$ 15.50
Totals	28,140,212	100%	$184,030	100%	$ 6.54

The foregoing calculations exclude the following shares as of September 30, 2013:

- 1,526,772 shares of common stock issuable upon the exercise of outstanding stock options having a weighted-average exercise price of $0.86 per share;
- 327,853 shares of common stock issuable upon the exercise of outstanding warrants having a weighted-average exercise price of $3.241 per share;
- 1,565,352 shares of common stock reserved for issuance pursuant to future awards under our 2011 Equity Incentive Plan, as amended, which will become available for issuance under our 2014 Incentive Plan after completion of this offering;
- 2,250,000 shares of common stock reserved for issuance (including the above-referenced shares reserved for issuance under our 2011 Equity Incentive Plan, as amended) pursuant to future equity awards under our 2014 Equity Incentive Plan, as well as any future increases in the number of shares of our common stock reserved for future issuance under this plan, which will become effective immediately prior to the completion of this offering; and
- 600,000 shares of common stock reserved for future issuance under our 2014 Employee Stock Purchase Plan, or 2014 ESPP, as well as any future increases in the number of shares of our common stock reserved for future issuance under the 2014 ESPP, which will become effective immediately prior to the completion of this offering.

Furthermore, we may choose to raise additional capital through the sale of equity or convertible debt securities due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. New investors will experience further dilution if any of our outstanding options or warrants 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

The selected statements of operations data for the years ended December 31, 2011 and 2012 and the selected balance sheet data as of December 31, 2011 and 2012 are derived from our audited financial statements included elsewhere in this prospectus. The selected statements of operations data for the nine months ended September 30, 2012 and 2013 and the selected balance sheet data as of September 30, 2013 have been derived from our unaudited financial statements included elsewhere in this prospectus. The unaudited interim financial information has been prepared on the same basis as the annual financial information and, in the opinion of management, reflects all adjustments, which include only normal recurring adjustments, necessary to present fairly our financial position as of September 30, 2013 and the results of operations for the nine months ended September 30, 2012 and 2013. Our historical results are not necessarily indicative of the results that may be expected in the future and interim results are not necessarily indicative of results to be expected for the full year. You should read the selected historical financial data below in conjunction with the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and the financial statements and related notes included elsewhere in this prospectus.

	Year Ended December 31,		Nine Months Ended September 30,	
	2011	2012	2012	2013
	(in thousands, except share and per share amounts)		(unaudited)	
Statements of Operations Data:				
Operating expenses:				
Research and development	$ 4,717	$ 12,641	$ 8,866	$ 19,625
General and administrative	1,844	3,344	2,441	3,130
Total operating expenses	6,561	15,985	11,307	22,755
Loss from operations	(6,561)	(15,985)	(11,307)	(22,755)
Interest income	4	1	—	157
Interest expense	(270)	—	—	—
Other expense	(22)	(350)	(97)	(1,155)
Net loss	$ (6,849)	$ (16,334)	$ (11,404)	$ (23,753)
Net loss attributable to common stockholders[1]	$ (7,466)	$ (19,561)	$ (12,749)	$ (31,624)
Net loss per share attributable to common stockholders, basic and diluted	$ (4.62)	$ (14.20)	$ (12.35)	$ (9.70)
Shares used to compute net loss per share attributable to common stockholders, basic and diluted	1,617,384	1,377,207	1,032,159	3,260,484
Pro forma net loss per share attributable to common stockholders, basic and diluted (unaudited)[1]		$ (2.02)		$ (1.16)
Shares used to compute pro forma net loss per share attributable to common stockholders, basic and diluted (unaudited)[1]		9,999,398		23,126,389

(1) See Notes 2 and 14 to our audited financial statements and Note 8 of our unaudited financial statements included elsewhere in this prospectus for an explanation of the calculations of basic and diluted net loss per share attributable to common stockholders and pro forma net loss per share attributable to common stockholders.

	As of December 31,		As of September 30,
	2011	2012	2013
		(in thousands)	(unaudited)
Balance Sheet Data:			
Cash, cash equivalents and marketable securities	$10,645	$ 86,190	$ 63,657
Working capital	9,954	83,257	61,067
Total assets	12,129	88,316	68,592
Convertible preferred stock warrant liability	216	518	1,596
Convertible preferred stock	18,604	111,387	118,002
Deficit accumulated during the development stage	(8,155)	(27,058)	(56,846)
Total stockholders' deficit	(7,961)	(27,047)	(56,848)

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 the section of this prospectus entitled "Selected Financial Data" and our financial statements and related notes included elsewhere in this prospectus. This discussion and other parts of this prospectus contain forward-looking statements that involve risk and uncertainties, such as statements of our plans, objectives, expectations, and intentions. As a result of many factors, including those factors set forth in the "Risk Factors" section of this prospectus, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

We are a development-stage biopharmaceutical company focused on the identification, acquisition, development, and commercialization of novel products for the treatment of rare and ultra-rare diseases, with an initial focus on serious, debilitating metabolic genetic diseases. We focus on diseases for which the unmet medical need is high, the biology for treatment is clear, and for which there are no approved therapies. Since our inception in 2010, we have in-licensed potential treatments for five different diseases that are or we expect will be in Phase 1/2 or Phase 2 clinical studies by early 2014. Our strategy, which is predicated upon time- and cost-efficient drug development, allows us to pursue multiple programs in parallel with the goal of delivering safe and effective therapies to patients with the utmost urgency.

Our current pipeline consists of two product categories: biologics, including a monoclonal antibody and enzyme replacement therapies; and small-molecule substrate replacement therapies. Enzymes are proteins that the body uses to process materials needed for normal cellular function, and substrates are the materials upon which enzymes act. When enzymes or substrates are missing, the body is unable to perform its normal cellular functions, often leading to significant clinical disease. Several of our therapies are intended to replace deficient enzymes or substrates.

Our biologics pipeline includes the following three product candidates:

- KRN23, or UX023, is an antibody targeting fibroblast growth factor 23, or FGF23, intended for the treatment of X-linked hypophosphatemia, or XLH, a rare genetic disease that impairs bone growth. We are developing KRN23 pursuant to our collaboration with Kyowa Hakko Kirin Co., Ltd., or KHK. KHK has conducted one Phase 1 study, one Phase 1/2 study and one Phase 1/2 extension study of KRN23 in adults with XLH. We expect to continue the clinical development of KRN23 in adults as well as initiate pediatric clinical development in 2014.
- rhGUS, or UX003, is an enzyme replacement therapy we are developing for the treatment of mucopolysaccharidosis 7, or MPS 7, a rare lysosomal storage disease that often leads to multi-organ dysfunction, pervasive skeletal disease, and death. We initiated a Phase 1/2 clinical study in MPS 7 in December 2013.
- rhPPCA, or UX004, is an enzyme replacement therapy in preclinical development for galactosialidosis, a rare lysosomal storage disease that can cause multi-system clinical disease similar to MPS 7 including enlarged liver, joint disease, abnormal bone development, short stature, and death. We plan to continue preclinical development of rhPPCA during 2014.

Our substrate replacement therapy pipeline includes the following product candidates in development for three diseases:

- Triheptanoin, or UX007, is a synthetic oil with a specifically designed chemical composition being studied in an investigator-sponsored Phase 2 study for the treatment of long-chain fatty acid oxidation disorders, or LC-FAOD. This is a set of rare metabolic diseases that prevent the conversion of fat into energy and can cause low blood sugar, muscle rupture, and heart and liver disease. We plan to initiate our own Phase 2 study in LC-FAOD in early 2014.

- Triheptanoin is also in an investigator-sponsored Phase 2 study for the treatment of glucose transporter type-1 deficiency syndrome, or Glut1 DS, a rare metabolic disease of brain energy deficiency that can result in seizures, developmental delay, and movement disorder. We plan to initiate our own Phase 2 clinical study in Glut1 DS in the first half of 2014.
- SA-ER, or UX001, is an extended-release form of sialic acid in a Phase 2 study for the treatment of hereditary inclusion body myopathy, or HIBM, a neuromuscular disorder that causes muscle weakness and wasting. We reported 24-week data from our ongoing Phase 2 study in HIBM in July 2013 and reported top-line 48-week data in December 2013.

We are considered a development-stage company under U.S. generally accepted accounting principles, or U.S. GAAP, and have only a limited operating history. Since our inception in 2010, we have devoted substantially all of our resources to identify, acquire, and develop our product candidates, including conducting clinical studies and providing general and administrative support for these operations. We have funded our operations to date primarily from the issuance and sale of convertible preferred stock and convertible promissory notes.

We have never been profitable and have incurred net losses in each year since inception. Our net losses were $6.8 million and $16.3 million for the years ended December 31, 2011 and 2012, and $11.4 million and $23.8 million for the nine months ended September 30, 2012 and 2013. As of September 30, 2013 we had a deficit accumulated during the development stage of $56.8 million. Substantially all of our net losses have resulted from costs incurred in connection with our research and development programs and from general and administrative costs associated with our operations.

Financial Operations Overview

Revenue

To date, we have not generated any revenue. We do not expect to receive any revenue from any product candidates that we develop until we obtain regulatory approval and commercialize our products or enter into collaborative agreements with third parties.

Research and Development Expenses

Research and development expenses consist primarily of costs incurred for the development of our product candidates, which include:

- expenses incurred under agreements with clinical study sites that conduct research and development activities on our behalf;
- expenses incurred under license agreements with third parties;
- employee and consultant-related expenses, which include salaries, benefits, travel, and stock-based compensation;
- laboratory and vendor expenses related to the execution of preclinical, non-clinical, and clinical studies;
- the cost of acquiring, developing, and manufacturing clinical study materials; and
- facilities, depreciation, and other expenses, which include direct and allocated expenses for rent and maintenance of facilities, insurance, and other supply costs.

We expense all research and development costs in the periods in which they are incurred. Costs for certain development activities are recognized based on an evaluation of the progress to completion of specific tasks using information and data provided to us by our vendors and clinical sites. Nonrefundable advance payments for goods or services to be received in future periods for use in research and development activities are deferred and capitalized. The capitalized amounts are then expensed as the related goods are delivered and the services are performed.

The largest component of our total operating expenses has historically been our investment in research and development activities, including the clinical development of our product candidates. We allocate research and development salaries, benefits, stock-based compensation, and indirect costs to our product candidates on a program-specific basis, and we include these costs in the program-specific expenses. We expect our research and development expenses will increase in absolute dollars in future periods as we continue to invest in research and development activities related to developing our product candidates, and as programs advance into later stages of development and we enter into larger clinical studies. The process of conducting the necessary clinical research to obtain FDA approval is costly and time consuming and the successful development of our product candidates is highly uncertain. As a result, we are unable to determine the duration and completion costs of our research and development projects or when and to what extent we will generate revenue from the commercialization and sale of any of our product candidates.

General and Administrative Expenses

General and administrative expenses consist primarily of personnel costs, allocated facilities costs, and other expenses for outside professional services, including legal, human resources, audit, and accounting services. Personnel costs consist of salaries, benefits, and stock-based compensation. We expect that our general and administrative expenses will increase in the future to support continued research and development activities, and as a result of operating as a public company, including expenses related to compliance with the rules and regulations of the Securities and Exchange Commission, or SEC, and those of any national securities exchange on which our securities are traded, additional insurance expenses, investor relations activities, and other administration and professional services.

Interest income

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

Interest expense

Interest expense consists of interest on outstanding borrowings under convertible promissory notes. We had no outstanding debt as of December 31, 2011 and thereafter as our convertible promissory notes and accrued interest were all converted into shares of Series A convertible preferred stock in 2011.

Other expense

Other expense primarily consists of gains and losses resulting from the remeasurement of our convertible preferred stock warrant liability. We will continue to record adjustments to the estimated fair value of the convertible preferred stock warrants until they are exercised, expired, or converted into warrants to purchase shares of our common stock upon the completion of a liquidity event, including the completion of an initial public offering. At that time, we will reclassify the convertible preferred stock warrant liability as additional paid-in capital and we will no longer record any related periodic fair value adjustments.

Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our financial statements, which have been prepared in accordance with U.S. GAAP. The preparation of these financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported expenses incurred during the reporting periods. Our estimates are based on our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. We

believe that the accounting policies discussed below are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management's judgments and estimates.

Accrued Research and Development Expenses

As part of the process of preparing financial statements, we are required to estimate and accrue expenses, the largest of which is related to accrued research and development expenses. This process involves reviewing contracts and purchase orders, identifying 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 costs.

We record accruals for estimated costs of research, preclinical and clinical studies, and manufacturing development. These costs are a significant component of our research and development expenses. A substantial portion of our ongoing research and development activities is conducted by third-party service providers. We accrue the costs incurred under our agreements with these third parties based on actual work completed in accordance with agreements established with these third parties. We determine the actual costs through discussions with internal personnel and external service providers as to the progress or stage of completion of the services and the agreed-upon fee to be paid for such services. We make significant judgments and estimates in determining the accrual balance in each reporting period. As actual costs become known, we adjust our accruals. Although we do not expect our estimates to be materially different from amounts actually incurred, our understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and could result in us reporting amounts that are too high or too low in any particular period. Our accrual is dependent, in part, upon the receipt of timely and accurate reporting from clinical research organizations and other third-party vendors. To date, there have been no material differences from our accrued estimated expenses to the actual clinical trial expenses.

Estimated Fair Value of Convertible Preferred Stock Warrant Liability

Warrants for the purchase of Series A convertible preferred stock that are contingently redeemable are classified as liabilities on the balance sheet at their estimated fair value. At the end of each reporting period, changes in estimated fair value during the period are recorded in other expense, net. We will continue to adjust the carrying value of the warrants until the earlier of the exercise of the warrants or the completion of a liquidity event, including the completion of an initial public offering, at which time the liabilities will be reclassified to additional paid-in capital.

We estimate the fair values of our convertible preferred stock warrants using an option-pricing model based on inputs as of the valuation measurement dates, including our estimated equity value at the valuation measurement dates, the estimated volatility of the price of our convertible preferred stock, the remaining contractual terms of the warrants, and the risk-free interest rates.

Stock-Based Compensation

Stock-based compensation costs related to stock options granted to employees are measured at the date of grant based on the estimated fair value of the award, net of estimated forfeitures. We estimate the grant date fair value, and the resulting stock-based compensation expense, using the Black-Scholes option-pricing model. The grant date fair value of the stock-based awards is recognized on a straight-line basis over the requisite service period, which is generally the vesting period of the respective awards.

The Black-Scholes option-pricing model requires the use of highly subjective assumptions which determine the fair value of stock-based awards. These assumptions include:

- *Expected term* — The expected term represents the period that the stock-based awards are expected to be outstanding and is determined using the simplified method (based on the midpoint between the vesting date and the end of the contractual term).

- *Expected volatility* — Since we are privately held and do not have any trading history for our common stock, the expected volatility was estimated based on the average volatility for comparable publicly traded biopharmaceutical companies over a period equal to the expected term of the stock option grants. When selecting comparable publicly traded biopharmaceutical companies on which we based our expected stock price volatility, we selected companies with comparable characteristics to us, including enterprise value, risk profiles, position within the industry, and with historical share price information sufficient to meet the expected life of the stock-based awards. The historical volatility data was computed using the daily closing prices for the selected companies' shares during the equivalent period of the calculated expected term of the stock-based awards. We will continue to apply this process until a sufficient amount of historical information regarding the volatility of our own stock price becomes available.
- *Risk-free interest rate* — The risk-free interest rate is based on the U.S. Treasury zero coupon issues in effect at the time of grant for periods corresponding with the expected term of option.
- *Expected dividend* — We have never paid dividends on our common stock and have no plans to pay dividends on our common stock. Therefore, we used an expected dividend yield of zero.

In addition to the assumptions used in the Black-Scholes option-pricing model, we must also estimate a forfeiture rate to calculate the stock-based compensation for our awards. We will continue to use judgment in evaluating the expected volatility, expected terms, and forfeiture rates utilized for our stock-based compensation calculations on a prospective basis.

For the years ended December 31, 2011 and 2012, stock-based compensation expense was $0.3 million and $0.9 million, respectively. For the nine month periods ended September 30, 2012 and 2013, stock-based compensation expense was $0.7 million and $0.4 million, respectively. As of September 30, 2013, we had $0.8 million of total unrecognized stock-based compensation costs, net of estimated forfeitures, which we expect to recognize over a weighted-average period of 2.4 years.

Fair Value of Common Stock

We are required to estimate the fair value of the common stock underlying our stock-based awards when performing the fair value calculations with the Black-Scholes option-pricing model. The fair value of the common stock underlying our stock-based awards was determined on each grant date by our board of directors, with input from management. Given the absence of a public trading market of our common stock, and in accordance with the American Institute of Certified Public Accountants, or AICPA, Practice Guide, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation*, our board of directors exercised reasonable judgment and considered numerous objective and subjective factors to estimate the fair value of our common stock.

All options to purchase shares of our common stock have been granted with an exercise price per share no less than the fair value per share of our common stock underlying those options on the date of grant. To assist our board of directors with the determination of the exercise price of our stock options and the fair value of the common stock underlying the options, we obtained third-party valuations of our common stock as of June 30, 2012, December 31, 2012, June 30, 2013, September 30, 2013, and November 30, 2013. Our board of directors considered the fair values of the common stock derived in the third-party valuations as one of the factors it considered when setting the exercise prices for options granted. Our board of directors also considered a range of objective and subjective factors and assumptions in estimating the fair value of our common stock on the date of grant, including:

- progress of our research and development efforts;
- our operating results and financial condition, including our levels of available capital resources;
- rights and preferences of our common stock compared to the rights and preferences of our other outstanding equity securities;
- our stages of development and material risks related to our business;

- the achievement of enterprise milestones, including entering into collaboration or license agreements and our progress in clinical trials;
- the valuation of publicly-traded companies in the life sciences and biotechnology sectors, as well as recently completed mergers and acquisitions of peer companies;
- equity market conditions affecting comparable public companies;
- the likelihood of achieving a liquidity event for the shares of common stock, such as an initial public offering given prevailing market and biotechnology sector conditions; and
- that the grants involved illiquid securities in a private company.

Contemporaneous Valuations

We obtained third-party valuations of our common stock as of June 30, 2012, December 31, 2012, June 30, 2013, and September 30, 2013 to assist our board of directors in estimating the fair value of our common stock at subsequent grant dates.

June 2012 and December 2012 Contemporaneous Valuations. The June 2012 and December 2012 valuations used 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 equity security. The June 2012 valuation, which was completed in July 2012, was based on the price of Series A convertible preferred stock that we sold to investors in July 2012. The December 2012 valuation was based on the price of Series B convertible preferred stock that we sold in December 2012. In both valuations, the contemporaneous transaction occurred in close proximity and involved third-party investors. Given the arm's-length nature of these financings, the close proximity of the Series A and Series B convertible preferred stock financings to the respective valuation dates, and the fair value hierarchy as described in FASB Accounting Standards Codification Topic 820, *Fair Value*, we believe the per share issuance prices of the Series A and Series B convertible preferred stock provide an indication of our equity value, as well as the fair value of common stock, as of June 30, 2012 and December 31, 2012, respectively.

The OPM treats common stock and preferred stock as call options on the total equity value of a company, with exercise prices based on the liquidation preference of the preferred stock. Under this method, the common stock has value only if the funds available for distribution to the stockholders exceed the value of the liquidation preference at the time of a liquidity event such as a merger, sale, or IPO, assuming the enterprise has funds available to make a liquidation preference meaningful and collectible by the stockholders. The common stock is modeled as a call option on the underlying equity value at a predetermined exercise price. In the 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. The OPM uses the Black-Scholes option-pricing model to price the call option. 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.

For purposes of the June 2012 valuation, we estimated the time to liquidity as 1.5 years based on then-current plans and estimates of our board of directors and management regarding a liquidity event. The volatility assumption was based on an analysis of guideline companies' historical equity volatility factors for a period of 1.5 years, which is the term assumption. Based on this analysis of the guideline companies, a volatility assumption of 67% was selected and utilized. The risk-free rate was estimated as the interpolated 1.5 year U.S. Treasury yield. A discount for lack of marketability of 31% was then applied to the value indicated in our common stock. Based on these factors, the third party valuation concluded that our common stock had a fair value of $0.81 per share as of June 30, 2012.

For purposes of the December 2012 valuation, we estimated the time to liquidity as 2.0 years based on then-current plans and estimates of our board of directors and management regarding a liquidity event. The time to

liquidity increased from 1.5 years from June 2012 to 2.0 years in December 2012 due to the completion of the Series B convertible preferred stock financing in December 2012, which provided us with the funds to be able to have a liquidity event at a later date. The volatility assumption was based on an analysis of guideline companies' historical equity volatility factors for a period of 2.0 years, which is the term assumption. Based on this analysis of the guideline companies, a volatility assumption of 75% was selected and utilized. The risk-free rate was estimated as the interpolated 2.0 year U.S. Treasury yield. A discount for lack of marketability of 40% was then applied to the value indicated in our common stock. Based on these factors, the third-party valuation concluded that our common stock had a fair value of $1.82 per share as of December 31, 2012.

June 2013 Contemporaneous Valuation. For purposes of the June 2013 valuation, a hybrid method was used to determine our equity value, which is a hybrid between the probability-weighted return methodology, or PWERM, and the OPM. The PWERM is a scenario-based analysis that estimates the value per share based on the probability-weighted present value of expected future investment returns, considering each of the possible outcomes available to us, as well as the economic and control rights of each share class. In the hybrid method, the OPM is used to estimate the allocation of value within one or more of PWERM scenarios. The hybrid method can be a useful alternative to explicitly modeling all PWERM scenarios in situations when the company has transparency into one or more near-term exits but is unsure about what will occur if the current plans fall through. The hybrid model was selected at this time for the reasons described below relating to our plans for a potential IPO.

The OPM was used to allocate the equity value to the various securities under two scenarios. The first scenario assumed we would complete an IPO within 12 months and the second scenario assumed we would remain private beyond 12 months with a potential sale or merger in 2.0 years. The estimated time to liquidity was 1.0 year and 2.0 years based on timing of a liquidity event in the two scenarios. Based on an analysis of the guideline companies, a volatility assumption of 75% was selected and utilized for both scenarios. The risk-free rate was estimated based on the applicable U.S. Treasury yield. A discount for lack of marketability of 20% and 35% was applied to the value indicated in our common stock under the first scenario and the second scenario, respectively. As of June 30, 2013 our board of directors had not authorized our management to begin preparations for a potential IPO. The board made this decision in late July, and that is when we initiated our preparation process. The increased probability of an IPO was retroactively taken into consideration in the June 30, 2013 valuation, which is a critical factor contributing to the increase in the fair value of our common stock as of that date. Based on these factors, the third-party valuation concluded that our common stock had a fair value of $4.07 per share as of June 30, 2013.

September 2013 Contemporaneous Valuation. For purposes of the September 2013 valuation, a hybrid method was used to determine our equity value, which is consistent with the method used in the June 2013 valuation.

The OPM was used to allocate the equity value to the various securities under two scenarios. The first scenario assumed we would complete an IPO within six months and the second scenario assumed we would remain private beyond 12 months with a potential sale or merger in 1.5 years. We estimated a probability of 60% for the first scenario and 40% for the second scenario compared to a 50% weighting for each in the June 2013 valuation. The increase in the probability of an IPO was because, at the July 2013 meeting of our board of directors, preparations for a potential IPO were authorized, we subsequently selected a banking syndicate, and on September 6, 2013 an organizational meeting was held in order to begin the IPO process. The estimated time to liquidity was six months and 1.5 years based on timing of a liquidity event in the two scenarios. Based on an analysis of the guideline companies, a volatility assumption of 75% was selected and utilized for both scenarios. The risk-free rate was estimated based on the applicable U.S. Treasury yield. A discount for lack of marketability of 10% and 30% was applied to the value indicated in our common stock under the first scenario and the second scenario, respectively. In addition, in July 2013, we announced that we would initiate development of triheptanoin for a new indication, Glut1 DS, which was incorporated into the valuation. In August 2013, we entered into a collaboration agreement with KHK, which was also incorporated into the valuation. Based on these factors, the third-party valuation concluded that our common stock had a fair value of $6.86 per share as of September 30, 2013.

November 2013 Contemporaneous Valuation. For purposes of the November 2013 valuation, a hybrid method was used to determine our equity value, which is consistent with the method used in the June 2013 and September 2013 valuations.

The OPM was used to allocate the equity value to the various securities under two scenarios. The first scenario assumed we would complete an IPO within three months and the second scenario assumed we would remain private beyond 12 months with a potential sale or merger in 1.5 years. We estimated a probability of 75% for the first scenario and 25% for the second scenario compared to 60% and 40%, respectively, in the September 2013 valuation. The increase in the probability of an IPO was due to the progress we have made since September 2013 in preparing for a potential IPO and in our development programs. In December 2013, we announced the dosing of the first patient in a Phase 1/2 study of rhGUS for MPS 7, our IND for triheptanoin for the treatment of Glut1 DS went into effect, and we released topline results from a 48-week Phase 2 clinical study of SA-ER showing apparent activity at the higher dose level. These developments were anticipated and taken into consideration in the November 2013 valuation. The estimated time to liquidity was three months and 1.5 years based on timing of a liquidity event in the two scenarios. Based on an analysis of the guideline companies, a volatility assumption of 70% was selected and utilized for both scenarios. The risk-free rate was estimated based on the applicable U.S. Treasury yield. A discount for lack of marketability of 5% and 30% was applied to the value indicated in our common stock under the first scenario and the second scenario, respectively. Based on these factors, the third-party valuation concluded that our common stock had a fair value of $11.19 per share as of November 30, 2013.

Stock Option Grants

Information regarding our stock option grants along with the estimated fair value per share of the underlying common stock, for stock options granted since January 1, 2012 is summarized in the table below:

Grant date	Number of common shares underlying options granted	Exercise price per common share	Estimated fair value per share of common stock
August 2, 2012	451,425	$ 0.81	$ 0.81
September 13, 2012	28,712	0.81	0.81
October 25, 2012	19,141	0.81	0.81
March 21, 2013	82,944	1.82	1.82
April 25, 2013	79,757	1.82	1.82
May 23, 2013	285,531	1.82	1.82
August 15, 2013	54,234	4.07	4.07
November 1, 2013	519,685	6.86	6.86
December 19, 2013	245,650	11.19	11.19

The intrinsic value of all outstanding options as of September 30, 2013 was $22.4 million based on the estimated fair value of our common stock of $15.50 per share, the midpoint of the estimated price range set forth on the cover of this prospectus.

The estimated fair value per share of the common stock in the table above represents the determination by our board of directors of the fair value of our common stock as of the date of the grant, as discussed below.

Stock Options Granted in August, September, and October 2012. Our board of directors granted stock options on August 2, 2012, September 13, 2012, and October 25, 2012, each having an exercise price of $0.81 per share. In establishing this exercise price, our board of directors considered input from management, the results of our June 30, 2012 third-party valuation, the objective and subjective criteria discussed above as well as the following: (i) in September 2012, we obtained the rights to rhPPCA and in-licensed North American rights to triheptanoin; (ii) triheptanoin had primarily been studied in academic settings with data available only from uncontrolled clinical studies or in anecdotal form; and (iii) rhPPCA has only ever been studied in mice and *in*

vitro, and we have made very limited investments in the development of this compound to date. As each of these compounds was speculative, early stage, and would require significant funds and risk on our part to advance, our board of directors did not believe that these events increased our equity value.

In the judgment of our board of directors, there were no internal or external developments that would indicate that the fair value of our common stock would have increased from June 30, 2012. As a result, our board of directors concluded that the fair value of our common stock at each of these grant dates was $0.81 per share.

Stock Options Granted in March, April, and May 2013. Our board of directors granted stock options on March 21, 2013, April 25, 2013, and May 23, 2013, each having an exercise price of $1.82 per share. In establishing this exercise price, our board of directors considered input from management, the results of our December 31, 2012 third-party valuation, the objective and subjective criteria discussed above as well as the following: (i) a toxicology study for rhGUS, a retrospective study for triheptanoin, and the Phase 2 study for SA-ER were all ongoing during this time period, but no results had yet been generated; and (ii) these studies were all either underway or already contemplated at the time of the financing upon which the December 31, 2012 valuation was based. Given the lack of clarity around a future liquidity event, and the lack of any significant clinical data in the first five months of 2013, in the judgment of our board of directors, there were no internal or external developments that would indicate that the fair value of our common stock had increased from December 31, 2012. As a result, our board of directors concluded that the fair value of our common stock at each of these grant dates was $1.82 per share.

Stock Options Granted in August 2013. Our board of directors granted stock options on August 15, 2013, each having an exercise price of $4.07 per share. In establishing this exercise price, our board of directors considered input from management, the results of our June 30, 2013 third-party valuation, the objective and subjective criteria discussed above as well as the following: (i) the probability of an IPO was already taken into consideration in the June 30, 2013 valuation and there was no change in probability as of August 15, 2013; (ii) the interim analysis of the 24-week data in our study of SA-ER showed only modest efficacy; (iii) although we had announced development of triheptanoin for Glut1 DS between June 30, 2013 and August 15, 2013, no clinical development activity had yet commenced as of the latter date; and (iv) our acquisition of ex-U.S. rights to triheptanoin, which was announced in July 2013, was already taken into consideration in the valuation as of June 30, 2013. As a result, our board of directors concluded that the fair value of our common stock at this grant date was $4.07 per share.

Stock Options Granted in November 2013. Our board of directors granted stock options on November 1, 2013, each having an exercise price of $6.86 per share. In establishing this exercise price, our board of directors considered input from management, the results of our September 30, 2013 third-party valuation, and the objective and subjective criteria discussed above. The board of directors considered the increase in the probability of an IPO from 50% as of June 30, 2013 to 60% as of September 30, 2013 and also concluded that no further change in this probability had taken place as of November 1, 2013. In the judgment of our board of directors, there were no internal or external developments that would indicate the fair value of our common stock would have increased from September 30, 2013. As a result, our board of directors concluded that the fair value of our common stock at this grant date was $6.86 per share.

Stock Options Granted in December 2013. Our board of directors granted stock options on December 19, 2013, each having an exercise price of $11.19 per share. In establishing this exercise price, our board of directors considered input from management, the results of our November 30, 2013 third-party valuation, and the objective and subjective criteria discussed above. The board of directors considered the increase in the probability of an IPO from 60% as of September 30, 2013 to 75% as of November 30, 2013 and also determined that there were no internal or external developments that would indicate the fair value of our common stock would have increased from November 30, 2013, as all developments in December had been anticipated and taken into consideration at that date. As a result, our board of directors concluded that the fair value of our common stock at this grant date was $11.19 per share.

Initial Public Offering Price

In consultation with the underwriters for this offering, we determined the estimated price range for this offering, as set forth on the cover page of this prospectus. The midpoint of the price range is $15.50 per share. In comparison, our estimate of the fair value of our common stock was $11.19 per share as of November 30, 2013. We note that, as is typical in initial public offerings, the estimated price range for this offering was not derived using a formal determination of fair value, but was determined by negotiation between us and the underwriters. Among the factors that were considered in setting this range were the following:

- an analysis of the typical valuation ranges seen in recent initial public offerings for companies in our industry;
- the general condition of the securities markets and the recent market prices of, and the demand for, publicly traded common stock of generally comparable companies;
- an assumption that there would be a receptive public trading market for pre-commercial biotechnology companies such as us; and
- an assumption that there would be sufficient demand for our common stock to support an offering of the size contemplated by this prospectus.

The midpoint of the estimated price range for this offering reflects an approximate $4.30 increase over the estimated valuation as of November 30, 2013 of $11.19 per share. Investors should be aware of this difference and recognize that the price range for this offering is in excess of our prior valuations. Further, investors are cautioned not to place undue reliance on the valuation methodologies discussed above as an indicator of future stock prices. We believe the difference may be due to the following factors:

- The contemporaneous valuation prepared as of November 30, 2013 contained two liquidity scenarios, including an initial public offering to be completed within three months of November 30, 2013, to which we assigned a probability weighting of 75%. We also applied a discount for lack of marketability of 5% in the initial public offering scenario of our November 30, 2013 valuation, which discount is not applied when determining the estimated price range for this offering. When the 5% discount for lack of marketability is not applied, the fair value per share of common stock in the initial public offering scenario as of November 30, 2013 would be $13.29, which is approximately $2.00 less than the estimated price range for this offering.
- We also believe that continued progress in the development of our product candidates between December 19, 2013 (our most recent option grant date) and consummation of this offering accounts for part of the increase between the estimated value at November 30, 2013 and the estimated price range for this offering. For example, we have further developed the clinical and regulatory strategy with respect to KRN23, and we have dosed our first patients in a Phase 1/2 study of rhGUS with no serious adverse events reported to date. We are also advancing our clinical programs for triheptanoin in both Glut1 DS and LC-FAOD, with enrollment expected to begin shortly in both trials. In addition, we have begun treating patients with higher doses of SA-ER with no serious adverse events reported to date.
- The initial offering price range necessarily assumes that this offering has occurred, a public market for our common stock has been created and that our preferred stock has converted into common stock in connection with this offering and, therefore, excludes the marketability or illiquidity discounts associated with the timing or likelihood of an initial public offering, the superior rights and preferences of our preferred stock and the alternative scenarios considered in the contemporaneous valuations over the past 18 months. Our November 30, 2013 valuation included an illiquidity discount of 5%.
- In the public markets we believe there are investors who may apply more qualitative and subjective valuation criteria to certain of our clinical assets than the valuation methods applied in our valuations, although there can be no assurance that this will in fact be the case. As described above, as a private company we used a more quantitative methodology to determine the fair value of our common stock and this methodology differs from the methodology used to determine the estimated price range for this

offering. The estimated price range for this offering was not derived using a formal determination of fair value, but rather was determined by negotiation between us and the underwriters. In particular, the estimate of fair value of our common stock as of November 30, 2013 was not a factor in setting the estimated price range for this offering.

- The price that investors are willing to pay in this offering, for which the price range is intended to serve as an estimate, may take into account other things that have not been expressly considered in our prior valuations, are not objectively determinable and that valuation models are not able to quantify.

Income Taxes

We use the liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial reporting and the tax bases of assets and liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. We assess the likelihood that the resulting deferred tax assets will be realized. A valuation allowance is provided when it is more likely than not that some portion or all of a deferred tax asset will not be realized.

As of December 31, 2012, our total deferred tax assets were $10.1 million. Due to our lack of earnings history and uncertainties surrounding our ability to generate future taxable income, the net deferred tax assets have been fully offset by a valuation allowance. The deferred tax assets were primarily comprised of federal and state tax net operating losses and tax credit carryforwards. Utilization of the net operating loss and tax credit carryforwards may be subject to an annual limitation due to historical or future ownership percentage change rules provided by the Internal Review Code of 1986, and similar state provisions. The annual limitation may result in the expiration of certain net operating loss and tax credit carryforwards before their utilization.

Results of Operations

Comparison of the nine months ended September 30, 2012 and 2013

	Nine Months Ended September 30,		Dollar Change	% Change
	2012	2013		
	(dollars in thousands)			
Operating expenses:				
Research and development	$ 8,866	$ 19,625	$ 10,759	121%
General and administrative	2,441	3,130	689	28%
Total operating expenses	11,307	22,755	11,448	101%
Loss from operations	(11,307)	(22,755)	(11,448)	101%
Interest income	—	157	157	*
Other expense	(97)	(1,155)	(1,058)	*
Net loss	$ (11,404)	$ (23,753)	$ (12,349)	108%

* *not meaningful*

Research and Development Expenses. Research and development expenses increased $10.8 million, or 121%, for the nine months ended September 30, 2013 compared to the same period in 2012. The following table summarizes our research and development expenses for the nine months ended September 30, 2012 and 2013 and for the period from April 22, 2010 (inception) through September 30, 2013.

	Nine Months Ended September 30,		Period from April 22, 2010 (Inception) Through September 30, 2013
	2012	2013	
	(dollars in thousands)		
Development candidate:			
rhGUS	$ 1,903	$ 5,915	$ 9,561
rhPPCA	141	205	384
Triheptanoin (LC-FAOD)	281	4,074	4,620
Triheptanoin (Glut1 DS)	—	1,032	1,032
SA-ER	5,223	5,942	17,268
KRN23	—	124	124
Preclinical and other research costs	1,318	2,333	4,952
Total research and development expenses	$ 8,866	$ 19,625	$ 37,941

The increase in research and development expenses above is primarily due to:

- for rhGUS, an increase of $4.0 million related to the development and manufacturing associated with supplying the product candidate for our toxicology and clinical studies;
- for triheptanoin (LC-FAOD), an increase of $3.8 million related to the initiation of our program in 2013, which included $0.8 million we paid to exercise the option with Baylor Research Institute, or BRI, pursuant to our license agreement with BRI to license the rights to triheptanoin in all territories outside of North America and $1.0 million in personnel-related costs as we allocated resources to this program, and costs related to the manufacture of clinical supplies;
- for triheptanoin (Glut1 DS), an increase of $1.0 million related to costs associated with the start up of clinical activities, including $0.4 million in personnel costs as we allocated resources to this program;
- for SA-ER, an increase of $0.7 million related to the increase in clinical activities for this program; and
- an increase of $1.0 million in preclinical and other product development costs for various other potential product candidates.

General and Administrative Expenses. General and administrative expenses increased $0.7 million, or 28%, for the nine months ended September 30, 2013 compared to the same period in 2012. The increase in general and administrative expenses was primarily due to increases in professional services costs and in personnel costs in support of our research and development activities.

Interest Income. Interest income increased $0.2 million for the nine months ended September 30, 2013 compared to the same period in 2012, primarily due to funds invested from our Series B convertible stock financing completed in December 2012.

Other Expense. Other expense increased $1.1 million for the nine months ended September 30, 2013 compared to the same period in 2012. The increase was due to the fair value remeasurement of the liability related to our convertible preferred stock warrants.

Comparison of Years Ended December 31, 2011 and 2012

	Year ended December 31,		Dollar Change	% Change
	2011	2012		
	(dollars in thousands)			
Operating expenses:				
Research and development	$ 4,717	$ 12,641	$ 7,924	168%
General and administrative	1,844	3,344	1,500	81%
Total operating expenses	6,561	15,985	9,424	144%
Loss from operations	(6,561)	(15,985)	(9,424)	144%
Interest income	4	1	(3)	*
Interest expense	(270)	—	270	*
Other expense	(22)	(350)	(328)	*
Net loss	$(6,849)	$(16,334)	$ 9,485	138%

* *not meaningful*

Research and Development Expenses. Research and development expenses increased $7.9 million, or 168%, for the year ended December 31, 2012 compared to the same period in 2011. The following table summarizes our research and development expenses for the years ended December 31, 2011 and 2012 and for the period from April 22, 2010 (inception) through September 30, 2013.

	Year Ended December 31,		Period from April 22, 2010 (Inception) through December 31, 2012
	2011	2012	
	(in thousands)		
Development candidate:			
rhGUS	$ 438	$ 3,198	$ 3,646
rhPPCA	7	172	179
Triheptanoin (LC-FAOD)	—	546	546
SA-ER	3,570	6,840	11,326
Preclinical and other research costs	702	1,885	2,619
Total research and development expenses	$4,717	$12,641	$ 18,316

The increase in research and development expenses above is primarily due to:

- for SA-ER, an increase of $3.3 million related to the development and manufacturing costs for our various clinical studies, increase in personnel costs, and the costs for our Phase 2 clinical study;
- for rhGUS, an increase of $2.8 million related to the development and manufacturing costs associated with supplying rhGUS for our various clinical studies;
- for triheptanoin, an increase of $0.5 million related to the increase in clinical activities, as well as $0.3 million paid to BRI to license the rights to triheptanoin; and
- an increase of $1.2 million in preclinical and other research costs for various other potential product candidates.

General and Administrative Expenses. General and administrative expenses increased $1.5 million, or 81%, for the year ended December 31, 2012 compared to the same period in 2011. The increase in general and administrative expenses was primarily due to increases in professional services costs and in personnel costs in support of our research and development activities.

Interest Expense. Interest expense decreased $0.3 million for the year ended December 31, 2012 compared to the same period in 2011. The decrease is due to the conversion of the outstanding convertible promissory notes and related accrued interest into shares of our Series A convertible preferred stock in June 2011.

Other Expense. Other expense increased $0.3 million for the year ended December 31, 2012 compared to the same period in 2011. The increase was primarily due to the fair value remeasurement of the liability related to our convertible preferred stock warrants.

Liquidity and Capital Resources

Since our inception, we have funded our operations primarily with $103.9 million in net proceeds from the sale of convertible preferred stock and $3.6 million in proceeds received from convertible promissory notes. As of September 30, 2013, we had $63.7 million in cash, cash equivalents, and marketable securities and a deficit accumulated during the development stage of $56.8 million.

Our primary use of cash is to fund operating expenses, which consist primarily of research and development expenditures. Due to our significant research and development expenditures, we have generated significant operating losses since our inception. Cash used to fund operating expenses is impacted by the timing of when we pay these expenses, as reflected in the change in our outstanding accounts payable and accrued expenses.

The following table summarizes our cash flows for the periods indicated (in thousands):

	Year Ended December 31,		Nine Months Ended September 30,	
	2011	2012	2012	2013
			(unaudited)	
Cash used in operating activities	$ (5,825)	$ (12,504)	$ (8,790)	$ (21,427)
Cash used in investing activities	(924)	(1,191)	(1,067)	(58,847)
Cash provided by financing activities	17,329	89,240	15,228	133
Net increase (decrease) in cash and cash equivalents	$ 10,580	$ 75,545	$ 5,371	$ (80,141)

Cash Used in Operating Activities

Cash used in operating activities for the nine months ended September 30, 2013 was $21.4 million and reflected net loss of $23.8 million, offset by non-cash charges of $0.3 million for depreciation and amortization, $1.0 million for the amortization of premium paid on purchased marketable securities, $0.4 million for stock-based compensation and $1.1 million for the revaluation of convertible preferred stock warrant liability. Cash used in operating activities also reflected a $2.7 million increase in prepaid expenses and other current assets primarily due to deferred offering costs related to our IPO and an increase in interest income receivable as our invested funds increased with the sale of our Series B convertible preferred stock in December 2012. The increase was offset by a $2.4 million increase in accounts payable and accrued liabilities primarily due to higher clinical study and related costs as we continued to increase our research and development activities.

Cash used in operating activities for the nine months ended September 30, 2012 was $8.8 million and reflected net loss of $11.4 million, offset by non-cash charges of $0.2 million for depreciation and amortization, $0.7 million for stock-based compensation and $0.1 million for the revaluation of convertible preferred stock warrant liability. Cash used in operating activities reflected an increase of $1.6 million in accounts payable and accrued liabilities related to higher clinical study and related costs and other research and development activities.

Cash used in operating activities for the year ended December 31, 2012 was $12.5 million and reflected net loss of $16.3 million, offset by non-cash charges of $0.9 million for stock-based compensation, $0.3 million for depreciation and amortization, and $0.3 million expense for the revaluation of the convertible preferred stock warrant liability. Cash used in operating activities also reflected an increase in accounts payable and accrued and other liabilities of $2.4 million related to higher clinical study and related costs and other research and development activities.

Cash used in operating activities for the year ended December 31, 2011 was $5.8 million and reflected net loss of $6.8 million, offset by non-cash charges of $0.3 million for interest expense related to the convertible promissory notes and $0.3 million for stock-based compensation. Cash used in operating activities also reflected

an increase in accounts payable and accrued and other liabilities of $0.7 million as we continued to increase our research and development activities and the timing of payments made to our vendors, which was partially offset by an increase in prepaid expenses and other current assets of $0.2 million.

Cash Used in Investing Activities

Cash used in investing activities for the nine months ended September 30, 2013 was $58.8 million and related to purchases of marketable securities of $63.1 million, proceeds from maturities of marketable securities of $4.5 million and purchases of property and equipment of $0.3 million.

Cash used in investing activities for the nine months ended September 30, 2012 was $1.1 million and primarily related to purchases of property and equipment related to our move to a new leased facility in March 2012.

Cash used in investing activities for the year ended December 31, 2012 was $1.2 million and related to purchases of property and equipment of $1.1 million related to our move to a new leased facility in March 2012 and an increase in restricted cash of $0.1 million.

Cash used in investing activities for the year ended December 31, 2011 was $0.9 million and was related to purchases of property and equipment of $0.5 million and an increase in restricted cash of $0.4 million.

Cash Flows Provided by Financing Activities

Cash provided by financing activities for the nine months ended September 30, 2013 was $0.1 million related to proceeds from the issuance of common stock for the exercise of stock options.

Cash provided by financing activities for the nine months ended September 30, 2012 was $15.2 million and primarily related to net proceeds from the issuance of convertible preferred stock of $15.1 million.

Cash provided by financing activities for the year ended December 31, 2012 was $89.2 million and primarily related to net proceeds from the issuance of convertible preferred stock of $89.0 million.

Cash provided by financing activities for the year ended December 31, 2011 was $17.3 million and related to net proceeds from the issuance of $14.9 million of convertible preferred stock and $2.4 million of promissory notes.

Funding Requirements

We believe that our existing capital resources, not including the proceeds we receive from this offering, will be sufficient to meet our projected operating requirements for at least the next 12 months. We anticipate that we will continue to generate losses for the foreseeable future, and we expect the losses to increase as we continue the development of, and seek regulatory approvals for, our product candidates, and begin to commercialize any approved products. If we need to raise additional capital to fund our operations and complete our ongoing and planned clinical studies, funding may not be available to us on acceptable terms, or at all. We expect to finance future cash needs through public or private equity or debt offerings. If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, 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.

Our future funding requirements will depend on many factors, including the following:

- the scope, rate of progress, results and cost of our clinical studies, nonclinical testing, and other related activities;
- the cost of manufacturing clinical supplies, and establishing commercial supplies, of our product candidates and any products that we may develop;
- the number and characteristics of product candidates that we pursue;
- the cost, timing, and outcomes of regulatory approvals;

- the cost and timing of establishing sales, marketing, and distribution capabilities; and
- the terms and timing of any collaborative, licensing, and other arrangements that we may establish, including any required milestone and royalty payments thereunder.

Contractual Obligations

The following table summarizes our contractual obligations at December 31, 2012 (in thousands):

	Payments due by period				
	Less than 1 year	1 to 3 years	3 to 5 years	More than 5 years	Total
Operating leases	$ 345	$570	$332	$ —	$1,247

JOBS Act Accounting Election

The Jumpstart our Business Startups Act of 2012, or the JOBS Act, permits an "emerging growth company" such as us to take advantage of an extended transition period to comply with new or revised accounting standards applicable to public companies. We are choosing to "opt out" of this provision and, as a result, we will comply with new or revised accounting standards as required when they are adopted. This decision to opt out of the extended transition period under the JOBS Act is irrevocable.

Newly Adopted Accounting Pronouncements

In February 2013, the Financial Accounting Standards Board issued Accounting Standards Update No. 2013-02, or ASU 2013-02, Reporting of Amounts Reclassified Out of Accumulated Other Comprehensive Income. ASU 2013-02 requires reporting and disclosure about changes in accumulated other comprehensive income balances and reclassifications out of accumulated other comprehensive income. We adopted this guidance as of January 1, 2013 on a prospective basis, and this adoption did not have an impact on our financial statements.

Off-Balance Sheet Arrangements

Since our inception, we have not engaged in any off-balance sheet arrangements, as defined in the rules and regulations of the SEC.

Quantitative and Qualitative Disclosures About Market Risk

Our exposure to market risk for changes in interest rates relates primarily to interest earned on our cash equivalents and marketable securities. The primary objective of our investment activities is to preserve our capital to fund operations. A secondary objective is to maximize income from our investments without assuming significant risk. Our investment policy provides for investments in low-risk, investment-grade debt instruments. As of September 30, 2013, we had cash, cash equivalents, and marketable securities totaling $63.7 million consisting of bank deposits, money market funds, and investment-grade corporate bonds which are subject to default, changes in credit rating, and changes in market value. The securities in our investment portfolio are classified as available for sale and are subject to interest rate risk and will decrease in value if market interest rates increase. A hypothetical 10% change in interest rates during any of the period presented would not have had a material impact on our financial statements. To date, we have not experienced a loss of principal on any of our investments.

We face foreign exchange risk as a result of entering into transactions denominated in currencies other than U.S. dollars. Due to the uncertain timing of expected payments in foreign currencies, we do not utilize any forward exchange contracts. All foreign transactions settle on the applicable spot exchange basis at the time such payments are made. An adverse movement in foreign exchange rates could have a material effect on payments made to foreign suppliers and for license agreements. A hypothetical 10% change in foreign exchange rates during any of the periods presented would not have had a material impact on our financial statements.

BUSINESS

Overview

We are a development-stage biopharmaceutical company focused on the identification, acquisition, development, and commercialization of novel products for the treatment of rare and ultra-rare diseases, with an initial focus on serious, debilitating metabolic genetic diseases. We focus on diseases for which the unmet medical need is high, the biology for treatment is clear, and for which there are no approved therapies. Since our inception in 2010, we have in-licensed potential treatments for five different diseases that are or we expect will be in Phase 1/2 or Phase 2 clinical studies by early 2014. Our strategy, which is predicated upon time- and cost-efficient drug development, allows us to pursue multiple programs in parallel with the goal of delivering safe and effective therapies to patients with the utmost urgency.

Our current pipeline consists of two product categories: biologics, including a monoclonal antibody and enzyme replacement therapies; and small-molecule substrate replacement therapies. Enzymes are proteins that the body uses to process materials needed for normal cellular function, and substrates are the materials upon which enzymes act. When enzymes or substrates are missing, the body is unable to perform its normal cellular functions, often leading to significant clinical disease. Several of our therapies are intended to replace deficient enzymes or substrates. Our biologics pipeline includes the following three product candidates:

- KRN23, or UX023, is an antibody targeting fibroblast growth factor 23, or FGF23, intended for the treatment of X-linked hypophosphatemia, or XLH, a rare genetic disease that impairs bone growth. We are developing KRN23 pursuant to our collaboration with Kyowa Hakko Kirin Co., Ltd., or KHK. KHK has conducted one Phase 1 study, one Phase 1/2 study and one Phase 1/2 extension study of KRN23 in adults with XLH. Data from the Phase 1/2 studies should be available in 2014. We expect to continue the clinical development of KRN23 in adults as well as initiate pediatric clinical development in 2014.
- rhGUS, or UX003, is an enzyme replacement therapy we are developing for the treatment of mucopolysaccharidosis 7, or MPS 7, a rare lysosomal storage disease that often leads to multi-organ dysfunction, pervasive skeletal disease, and death. We initiated a Phase 1/2 clinical study in MPS 7 in December 2013.
- rhPPCA, or UX004, is an enzyme replacement therapy in preclinical development for galactosialidosis, a rare lysosomal storage disease that can cause multi-system clinical disease similar to MPS 7 including enlarged liver, joint disease, abnormal bone development, short stature, and death. We plan to continue preclinical development of rhPPCA during 2014.

Our substrate replacement therapy pipeline includes the following product candidates in development for three diseases:

- Triheptanoin, or UX007, is a synthetic oil with a specifically designed chemical composition being studied in an investigator-sponsored Phase 2 study for the treatment of long-chain fatty acid oxidation disorders, or LC-FAOD. This is a set of rare metabolic diseases that prevent the conversion of fat into energy and can cause low blood sugar, muscle rupture, and heart and liver disease. We plan to initiate our own Phase 2 study in LC-FAOD in early 2014.
- Triheptanoin is also in an investigator-sponsored Phase 2 study for the treatment of glucose transporter type-1 deficiency syndrome, or Glut1 DS, a rare metabolic disease of brain energy deficiency that can result in seizures, developmental delay, and movement disorder. We plan to initiate our own Phase 2 clinical study in Glut1 DS in the first half of 2014.
- SA-ER, or UX001, is an extended-release form of sialic acid in a Phase 2 study for the treatment of hereditary inclusion body myopathy, or HIBM, a neuromuscular disorder that causes muscle weakness and wasting. We reported 24-week data from our ongoing Phase 2 study in HIBM in July 2013 and reported top-line 48-week data in December 2013.

Our current product candidate pipeline has been either in-licensed from academic institutions or derived from partnerships with other pharmaceutical companies. Where possible, our strategy is to acquire and retain

global commercialization rights to our products to maximize long-term value. Over time, we intend to build our own commercial organization, which we believe will be of modest size due to the relatively small number of specialists who treat patients with rare and ultra-rare diseases.

The patients we seek to treat have diseases with limited or no treatment options, and we recognize that their lives and well-being are highly dependent upon our efforts to develop new therapies. For this reason, we are passionate about developing these therapies with the utmost urgency and care. We strive to build a company that is faster, better, and smarter about advancing multiple product candidates through approval.

We were founded in April 2010 by our current President and Chief Executive Officer, Dr. Emil Kakkis, M.D., Ph.D., who is the former Chief Medical Officer of BioMarin Pharmaceutical Inc. We have assembled an experienced team with extensive drug development and commercialization capabilities, particularly in the orphan drug area. Dr. Kakkis and the team at Ultragenyx have been previously involved at other companies, in the development and/or commercialization of many therapies approved or in development for rare metabolic genetic diseases, including Aldurazyme, Naglazyme, Kuvan, and Vimizim (BioMarin); Lumizyme/Myozyme (Sanofi-Genzyme); and asfotase alpha (Enobia; now Alexion). Our investors include, but are not limited to, the following entities or their affiliates or funds advised by them: TPG Biotech, Fidelity Biosciences (Beacon Bioventures), HealthCap, Pappas Ventures, Adage Capital Partners, L.P., Capital Research Global Investors, Columbia Wanger Asset Management, Jennison Associates LLC, BlackRock, Inc., Genzyme Corporation, Shire LLC, and Ramius LLC.

Our Strategy

Our strategy is to identify, acquire, develop, and commercialize novel products for the treatment of rare and ultra-rare diseases in the United States, the European Union, and select international markets, with the goal of becoming a leading rare disease biotechnology company. The critical components of our business strategy include the following:

- ***Focus on rare and ultra-rare diseases with significant unmet medical need.*** There are numerous rare and ultra-rare metabolic genetic diseases that currently have no approved drug therapy and for which no therapies are currently in development. Patients suffering from these diseases often have a high unmet medical need with significant morbidity and/or mortality. We are focused on developing and commercializing therapies for multiple such indications with the utmost urgency.
- ***Focus on diseases and therapies with clear mechanisms of action.*** We also focus on diseases that have biology and root causes that are well understood. For example, several of our product candidates are replacement therapies for a single deficient enzyme or substrate in the body. We believe that developing drugs that directly impact known disease pathways will increase the probability of success of our development programs.
- ***Leverage our experience and relationships to in-license promising product candidates.*** Our management team has strong relationships with key opinion leaders in the metabolic genetic field, as well as a history of success in the development and commercialization of therapies for rare and ultra-rare genetic diseases. Accordingly, we enjoy unique access to many in-licensing opportunities. All of our current product candidates are in-licensed from academic institutions or derived from partnerships with other pharmaceutical companies on attractive terms. We believe these parties have agreed to license product candidates to us because they are confident in our drug development capabilities and experience in bringing rare disease therapies to market.
- ***Develop and commercialize multiple product candidates in parallel.*** Clinical studies for rare and ultra-rare diseases can often be smaller, fewer in number, and less expensive than those for larger market indications. Development of multiple programs in the metabolic genetics field also generates organizational efficiencies and economies of scale. As a result of these efficiencies, we can feasibly develop multiple clinical-stage product candidates in parallel, resulting in a more diversified portfolio that provides multiple opportunities to create value.

- ***Focus on excellent and rapid clinical and regulatory execution.*** We believe that building a successful and sustainable rare disease-focused company requires very specific expertise in the areas of patient identification, clinical study design and conduct, and regulatory strategy. We have assembled a team with a successful track record in managing global clinical development activities in an efficient manner, and with multinational experience in obtaining regulatory approvals for rare disease products.
- ***Seek to retain global commercialization rights to product candidates.*** We intend to seek and retain global commercialization rights to our product candidates whenever possible to maximize the potential value of our product portfolio. Our plan is to establish our own commercial organization in major pharmaceutical markets and develop a network of third-party distributors in smaller markets. We believe this commercial organization can be modest and targeted due to the relatively small number of specialists who typically treat patients with the diseases to be addressed by our product candidates. As a result, we do not expect that we will require pharmaceutical partners for commercialization of our product candidates, although we may consider partnering for certain territories or indications or for other strategic purposes.

Product Candidates

The following table summarizes our product candidate pipeline:

Candidate	Description	Indication	Pre-clinical	Phase 1	Phase 1/2 or Phase 2	Phase 3 or pivotal	Status / Anticipated milestones	Ultragenyx commercial rights
Biologics								
KRN23 (UX023)	Anti-FGF23 monoclonal antibody	XLH					▪ Expect to initiate pediatric clinical development in 2014	▪ U.S. and Canada: Joint with KHK (profit share) ▪ Mexico, Central and South America
rhGUS (UX003)	Enzyme replacement	MPS 7					▪ Expect interim data from Phase 1/2 clinical study in 2014	▪ Worldwide
rhPPCA (UX004)	Enzyme replacement	Galactosialidosis					▪ Expect to continue preclinical development during 2014	▪ Worldwide
Substrate replacement therapies								
Triheptanoin (UX007)	Substrate replacement	LC-FAOD					▪ Expect to initiate Phase 2 clinical trial by early 2014	▪ Worldwide
Triheptanoin	Substrate replacement	Glut1 DS					▪ Expect to initiate Phase 2 clinical trial in the first half of 2014	▪ Worldwide
SA-ER (UX001)	Substrate replacement	HIBM					▪ Expect data from ongoing Phase 2 extension study in late 2014	▪ Worldwide (excluding Japan and certain other Asian territories)

Biologics product candidates

KRN23 (UX023) for the treatment of XLH

KRN23 is a fully human monoclonal antibody administered via subcutaneous injection that is designed to bind and reduce the biological activity of FGF23 to increase abnormally low phosphate levels in patients with XLH. In August 2013, we formed a collaboration with and licensed certain intellectual property from Kyowa Hakko Kirin Co., Ltd., or KHK, to jointly develop and commercialize KRN23 for the treatment of XLH. KHK has conducted one Phase 1 study, one Phase 1/2 study and one Phase 1/2 extension study of KRN23 in adults with XLH. We reviewed data from the Phase 1/2 studies prior to entering into our collaboration with KHK, and we expect to release data for the Phase 1/2 studies in 2014. We expect to continue the clinical development of KRN23 in adults as well as initiate pediatric clinical development in 2014.

XLH disease background

Patients with XLH have low serum phosphate, which can also be referred to as phosphorous, levels due to excessive phosphate loss into the urine, which is directly caused by the effect on kidney function of excess FGF23 production in bone cells. FGF23 is produced by cells responsible for bone formation to manage calcification as part of bone growth and remodeling by signaling to the kidney to promote phosphate excretion and to suppress vitamin D production when phosphate levels are too high. Low phosphate levels lead to poor bone mineralization and a variety of clinical manifestations, including skeletal deformity, bone pain, short stature, gross motor impairment, muscle weakness, and lower than normal bone density. XLH is an inherited genetic disease that can be genetically confirmed and affects both males and females. Diagnosis of the disease typically takes place via assessment of clinical presentation, x-ray of the bones, and urine and blood tests to confirm renal phosphate wasting.

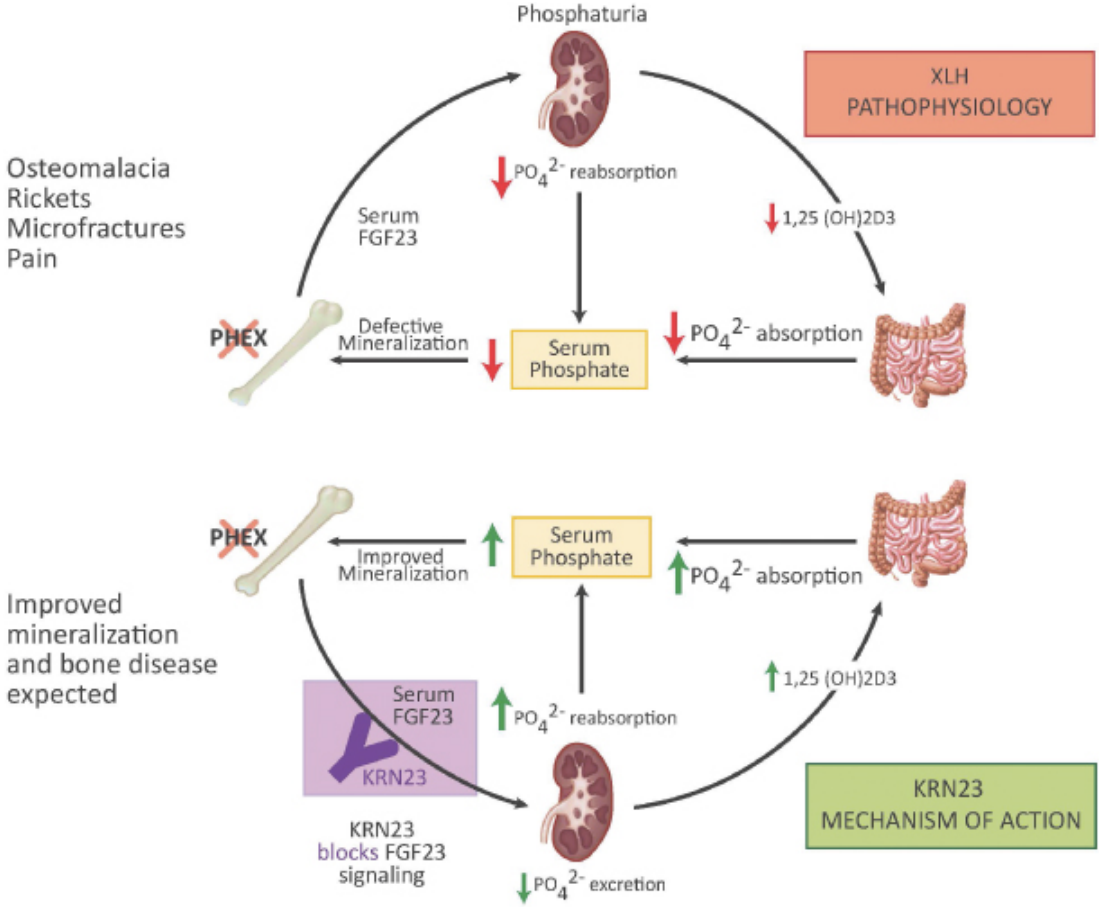
XLH patients have a genetic deficiency in a regulatory system that senses phosphate levels and uses FGF23 to control serum phosphate. The deficiency interferes with this regulatory process and leads to abnormal up-regulation of FGF23, which causes phosphate wasting by the kidney. FGF23 induces profound reductions in serum phosphate levels by two mechanisms simultaneously: reducing renal reabsorption via reducing expression of a sodium phosphate co-transporter, as well as reducing intestinal phosphate reabsorption via a reduction in active vitamin D production.

There is no approved drug therapy or treatment for the underlying cause of XLH. Most patients are managed using oral phosphate replacement and vitamin D therapy, which is only partially effective at restoring bone physiology and growth and has significant side effects. These therapies require extremely close monitoring due to the potential for excessive spikes in phosphate levels, which can result in severe damage to the kidneys from excess calcium and phosphate deposits and other complications. Additionally, some patients are unable to tolerate the regimen due to the chalky stool that results from taking large amounts of oral phosphate or the high frequency of dosing required. We believe XLH patients need a better treatment option that is more specific to the underlying cause of the disease and safer in how it manages phosphate levels.

KRN23 background and clinical development

KRN23 is designed to bind FGF23 and interfere with a required co-stimulatory signaling mechanism. The interference in FGF23 signaling is intended to prevent phosphate wasting in the urine and increase serum phosphate levels. Increased serum phosphate levels are intended to improve bone mineralization and reduce the severity of the clinical manifestations of XLH.

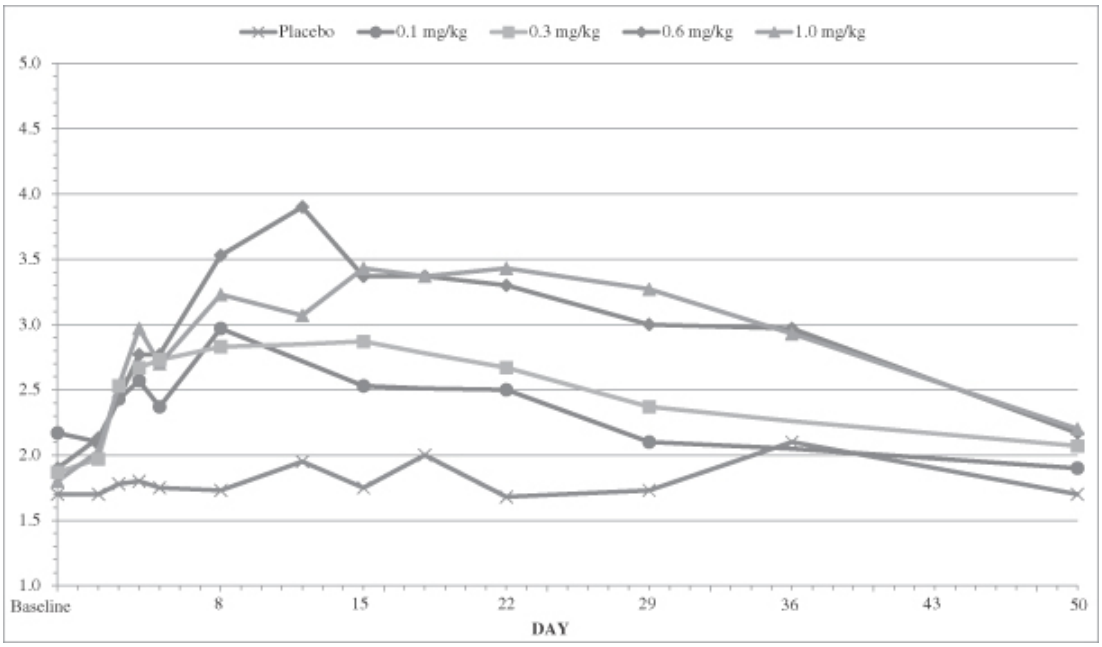
The following graphic illustrates the pathophysiology of XLH and the mechanism of action of KRN23.



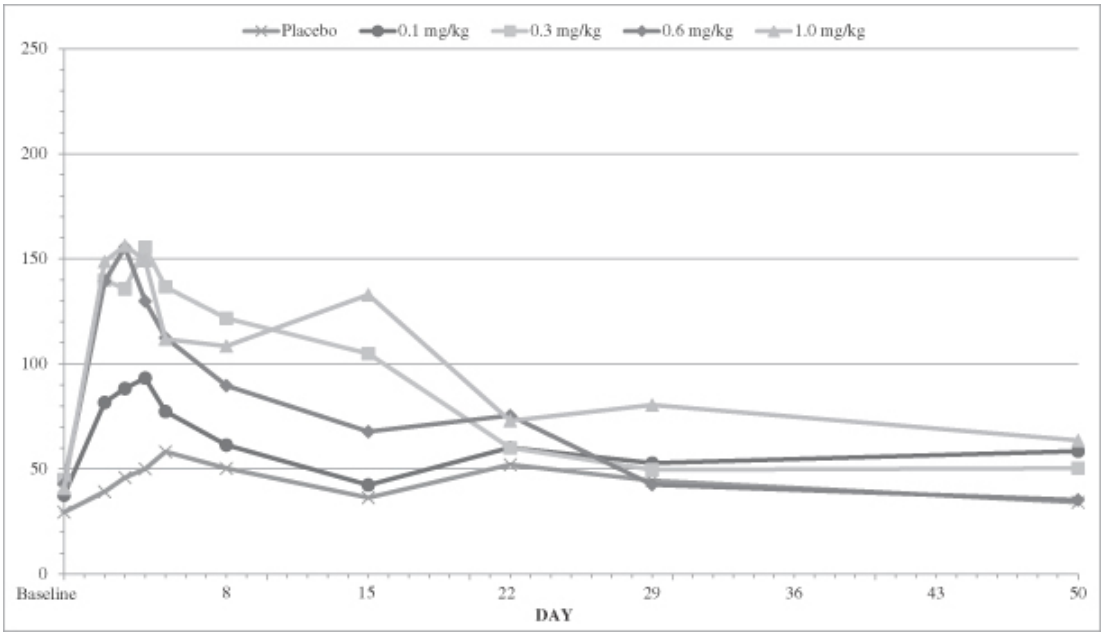
KHK has conducted one Phase 1 study, one Phase1/2 study, and one Phase 1/2 extension study of KRN23 in adults with XLH. Results from the Phase 1 single dose study in 38 adult XLH patients were presented at the American Society for Bone and Mineral Research in October 2013 and demonstrated that KRN23 was well tolerated and increased serum phosphate, or phosphate in the blood, and vitamin D levels. Of the 38 adult XLH patients, 12 received a single subcutaneous injection of KRN23 (at doses of 0.1, 0.3, 0.6, or 1.0 mg/kg), 17 received a single intravenous injection of KRN23 (at doses of 0.003, 0.01, 0.03, 0.1, or 0.3 mg/kg) and 9 received placebo. The effect of KRN23 on the increase in serum phosphate levels was comparable between intravenous and subcutaneous administration; however, time to reach peak effect was slower and duration of effect was greater with subcutaneous administration compared with intravenous administration. Although the phosphate levels did not reach the normal range, the demonstrated improvement suggests that significant benefit could be expected. No serious adverse events were reported in the Phase 1 study, although some patients (approximately 82%) experienced non-serious treatment-emergent adverse events. The most common non-serious treatment-emergent adverse events in the study overall were nausea and headache, although no patients in the placebo or subcutaneous treatment arms reported these events. In the subcutaneous arm, two patients (approximately 17%) experienced elevated levels of the enzyme amylase in the blood, and two patients (approximately 17%) experienced back pain. There did not appear to be a relationship between the incidence and types of adverse events and the dose administered following a single dose of study drug. The following graphics illustrate the results of KHK's Phase 1 single dose study relating to serum phosphate and vitamin D levels after subcutaneous injection, which is the route of administration planned for use in all subsequent clinical trials. Increases were statistically significant at the 0.3, 0.6, and 1.0 mg/kg

subcutaneous dose levels, with p-values less than 0.05 for serum phosphate and less than 0.001 for vitamin D. P-values are an indication of statistical significance reflecting the probability of an observation occurring due to chance alone. Differences with a p-value of less than 0.05 are considered statistically significant.

Serum Phosphate (mg/dL)



Vitamin D (pg/mL)



We expect to continue to develop KRN23 in adults with XLH. We are beginning clinical development for a pediatric indication for KRN23 and plan to initiate a Phase 2 pediatric study in 2014, in patients with radiographic evidence of bone disease, following discussions with multiple regulatory agencies on our pediatric investigation plan. Depending on the results of our Phase 2 pediatric study, we intend to conduct a Phase 3 pediatric trial. Given the high turnover and growth of bone during childhood and the critical role phosphate plays in bone growth, pediatric XLH patients have the highest morbidity and potential for benefit. As a result, pediatric XLH patients may also have the greatest potential for improvement based on third-party data regarding enzyme replacement therapy in hypophosphatasia, which is another genetic bone disease with poor bone mineralization related to phosphate metabolism caused by a different, unrelated mechanism. Furthermore, given the more rapid turnover of bone in children as compared to adults, the timeframe to observe improvement is expected to be more rapid as well. We also plan to conduct an adult Phase 2b study in parallel with our Phase 3 pediatric trial.

Potential market opportunity

Based on incidence and prevalence rates published in a Danish epidemiologic study and surveys of physicians in the United States, we estimate that there are approximately 3,000 cases of XLH in pediatric patients in the United States. Further, there are an estimated 9,000 cases of XLH in adult patients in the United States. However, we expect that many of these adult patients may not seek treatment if their bone disease is not too severe.

rhGUS (UX003) for the treatment of MPS 7

We are developing recombinant human beta-glucuronidase, or rhGUS, as an intravenous, or IV, enzyme replacement therapy for the treatment of MPS 7, also known as Sly Syndrome. Patients with MPS 7 suffer from severe cellular and organ dysfunction that typically leads to death in the teens or early adulthood. MPS 7 is caused by a deficiency of the lysosomal enzyme beta-glucuronidase, or GUS, which is required for the breakdown of certain complex carbohydrates known as glycosaminoglycans, or GAGs. The inability to properly break down GAGs leads to their accumulation in many tissues, resulting in a serious multi-system disease. We licensed exclusive worldwide rights to rhGUS-related know-how and cell lines from Saint Louis University in November 2010. We initiated a Phase 1/2 study of rhGUS in MPS 7 patients in December 2013 and expect to report interim data in 2014.

MPS 7 disease background

Patients with MPS 7 may have abnormal coarsened facial features, enlargement of the liver and spleen, airway obstruction, lung disease, cardiovascular complications, joint stiffness, short stature, and a skeletal disease known as dysostosis multiplex. In addition, many patients experience progressive lung problems as a result of airway obstruction and mucous production, often leading to sleep apnea and pulmonary insufficiency, and eventually requiring tracheostomy. Significant enlargement of the liver and spleen and an abnormal ribcage, when combined with frequent recurrent and chronic infections, can lead to progressive respiratory compromise and failure. Heart disease is also common in patients with severe MPS 7, although it may not develop or manifest until later in life. Lysosomal storage of GAGs within the joint tissues can lead to significant stiffness and restriction of mobility in the hip, shoulder, elbow, and knee joints. All of these disease complications can result in severe pain or the inability to walk. Additional symptoms can include corneal clouding, hernias, visual loss, hearing loss, and developmental delay.

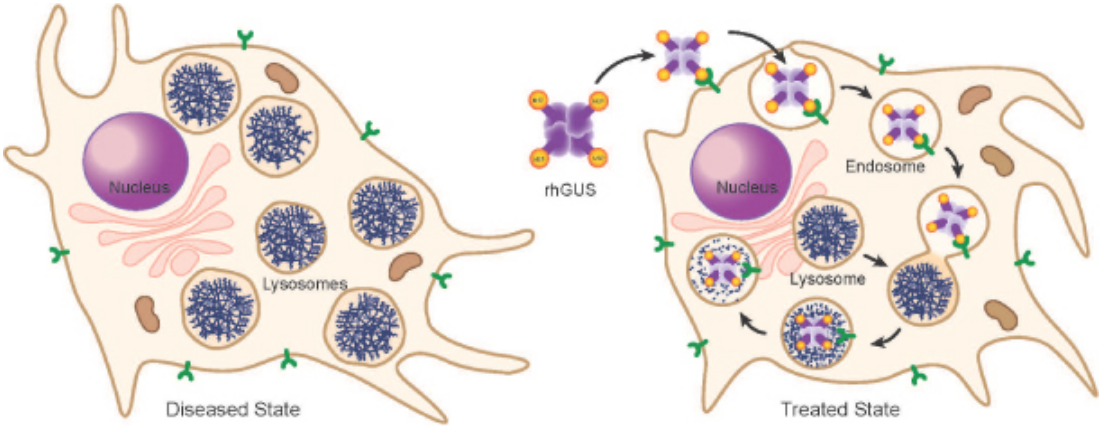
Most MPS 7 patients die between their teenage years and thirties, though some may live longer. The most severe form of the disease can uniquely present at birth with non-immune hydrops fetalis, which is fatal in the majority of affected patients and may account for as much as half of the disease incidence. Non-immune hydrops fetalis is a very severe neonatal condition in which the child retains an enormous amount of fluid throughout the body. Infants with hydrops fetalis rarely survive beyond a few weeks to a few months of age.

MPS 7 is often suspected from coarsened facial features, physical disease, and liver enlargement on clinical examination. Urine tests demonstrate excess GAG excretion, and the specific MPS disease is definitively diagnosed through tests that demonstrate a deficiency in GUS enzyme activity. Prenatal diagnostic tools have also been used to verify if a fetus has a deficiency of the enzyme and is affected with the disease.

There are currently no approved drug therapies for MPS 7. A few patients have been given bone marrow or hematopoetic stem cell transplants, but their skeletal and connective tissue disease is not effectively treated by these transplants, and the morbidity and mortality of the transplant procedure can be significant, particularly if not conducted during the first two years of life.

rhGUS background

GUS is an enzyme found in the lysosome, a digestive compartment inside the cell needed to process sugars, fats, and proteins. As with other lysosomal enzymes, uptake of GUS into cells and tissues occurs by a particular receptor that recognizes a certain residue on the enzyme, known as mannose-6-phosphate, which is critical for optimal tissue distribution and rapid clearance of GAGs. Studies in cell culture and *in vivo* have demonstrated that our rhGUS product candidate is taken up into cells efficiently by this receptor, resulting in the delivery of the enzyme into the lysosomes and clearance of stored GAGs in MPS 7 animal models. The following graphic illustrates the receptor-mediated uptake of the rhGUS enzyme by the diseased cell and the subsequent clearance of storage of accumulated GAGs in the lysosomes.

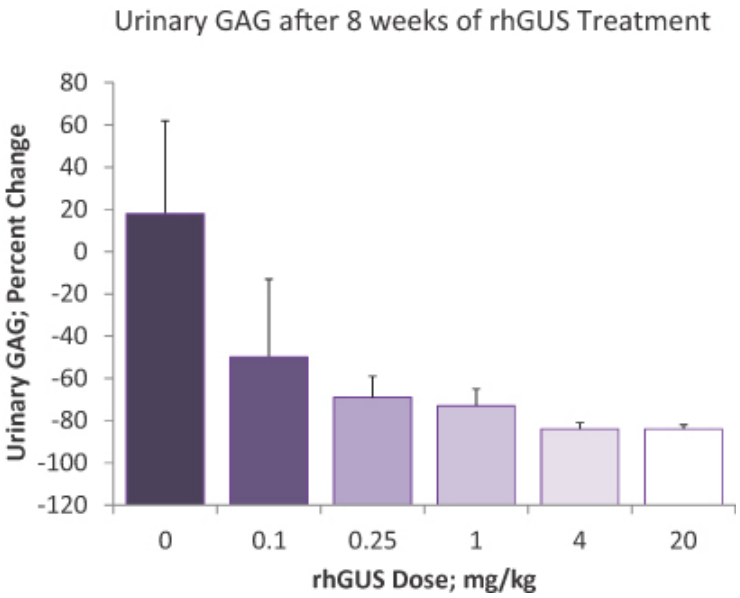


The use of enzyme replacement therapy as a potential treatment is based on 20 years of research work in murine models of the disease. Historical studies in preclinical models of MPS 7 have shown that human or mouse GUS enzyme replacement achieves distribution to many tissues, including the brain, and significantly reduces or prevents lysosomal storage during treatment. The reduced lysosomal storage correlates with significant improvements in bone development, growth, cognitive ability, hearing, immune function, and survival.

Efficacy data from randomized controlled Phase 3 studies conducted by third parties for other enzyme deficiencies treated with other enzyme replacement therapies have been published for other related lysosomal diseases, including MPS 1, MPS 6, and MPS 2. All three of these enzyme replacement therapies reduced lysosomal storage in Phase 3 clinical studies resulting in reduction in liver size to normal or near normal, as well as significant reduction in spleen size. Additionally, the three enzyme replacement therapies showed improvement in pulmonary function, walking ability, joint range of motion in patients with more severe joint mobility restriction, and sleep apnea for those patients with abnormal airway function during sleep at baseline. Urinary GAG excretion also decreased significantly in these studies. All three products have been approved in the United States and the European Union as well as other territories worldwide based on safety and efficacy presented in these Phase 3 programs. Based on these results, we believe there is a strong rationale for our approach to treat MPS 7 with rhGUS.

Preclinical results

We have conducted preclinical studies to support the chronic intravenous, or IV, administration of rhGUS. Administration of rhGUS resulted in substantial distribution of enzyme, as well as reduction in tissue pathology in a wide variety of tissues, including the liver, spleen, lung, heart, kidney, muscle, bone, and brain. No adverse toxicology was noted in these studies. The following graph shows dose-dependent urinary GAG reduction in mice after administration of rhGUS for eight weeks.



For the toxicology program, rhGUS was administered in two species, with no infusion-associated reactions or clinical problems noted.

Clinical development

In December 2013, we initiated an open-label, Phase 1/2 study to evaluate the safety, tolerability, efficacy, and dose of IV administration every other week of rhGUS in four to five patients with MPS 7 who are between five and 30 years of age. The initial 12-week treatment period will be followed by a dose-titration period and a long-term extension study. We expect to receive interim data from this study in 2014. If results from the initial 12-week treatment period from this study are supportive, we plan to initiate a pivotal Phase 3 study enrolling at least 12 patients.

With respect to our rhGUS program, although we have not yet filed an investigational new drug, or IND, application, we have held meetings regarding the pathway for potential approval of the program for MPS 7 with the United States Food and Drug Administration, or the FDA, and the European Medicines Agency, or EMA. The EMA agreed that approval under exceptional circumstances could be possible for a proposed 12-patient placebo-controlled pivotal study in this disease with urinary GAG levels as a surrogate primary endpoint provided the data was strongly supportive of a favorable benefit/risk ratio. The EMA requested that some evidence or trend in improvement in clinical endpoints be observed to support the primary endpoint, but recognized that a statistically significant result on clinical endpoints was unlikely given the small number of patients expected to be enrolled in the study. The FDA would like to see additional data correlating urinary GAG levels with other clinical endpoints, which we plan to collect both through our Phase 1/2 study as well as through an ongoing retrospective study correlating urinary GAG levels with clinical endpoints in other MPS diseases.

In addition to the above development plan, we intend to study MPS 7 patients under the age of five years, including younger infants born with hydrops fetalis. Currently, these infants often die within a few months to one

year, but enzyme replacement therapy might be able to reduce GAG storage and improve health and survival in these patients. We are also supplying rhGUS to an investigator who is treating a single U.S. patient under an emergency IND. We expect that results from the treatment of this patient will be presented at the Lysosomal Disease Network's 10th Annual World Symposium in February of 2014.

Potential market opportunity

Through our ongoing survey work with metabolic clinics, we have identified approximately 90 potential MPS 7 patients worldwide to date, including approximately 15 in the United States. Based on our experiences with other MPS diseases, we expect that, over time, more patients will be identified during patient identification efforts globally, potentially resulting in up to approximately 200 patients in the developed world. Based on published literature, we also estimate that approximately 20 patients per year worldwide are born with non-immune hydrops fetalis due to MPS 7. The establishment of efficacy and safety with our therapy may help drive ascertainment of MPS 7 patients.

rhPPCA (UX004) for the treatment of galactosialidosis

We licensed the rights to recombinant human protective protein cathepsin-A, or rhPPCA, from St. Jude Children's Research Hospital in September 2012. rhPPCA is in preclinical development as an enzyme replacement therapy for galactosialidosis, a rare lysosomal storage disease for which there are no currently approved drug therapies. As with MPS 7, an enzyme deficiency results in accumulation of substrates in the lysosomes, causing skeletal and organ dysfunction, and death. In galactosialidosis, the missing protease, cathepsin A, is a lysosomal stabilizing agent for the two other enzymes: sialidase and beta-galactosidase. Cathepsin A is therefore also called "protective protein," or PPCA. PPCA enzyme deficiency leads to an accumulation of oligosaccharides, or short sugar chains. Enzyme replacement therapy *in vitro* and in the mouse model of this condition has shown that the replacement of PPCA results in reduction in storage of oligosaccharides in multiple organs, just as has been observed in other enzyme replacement therapies. In the 2014 to 2015 timeframe, we intend to pursue process development and manufacture development-scale quantities of rhPPCA in order to conduct proof-of-concept experiments in preclinical animal models of galactosialidosis. Depending on the results of our proof-of-concept preclinical studies, we may begin clinical studies in 2015 or 2016.

Small-molecule product candidates

Triheptanoin (UX007) for the treatment of LC-FAOD

We are developing triheptanoin for oral liquid administration intended as a substrate replacement therapy for patients with long-chain fatty acid oxidation disorders, or LC-FAOD. Patients with LC-FAOD have a deficiency that impairs both fatty acid metabolism and the Krebs cycle, which is a series of chemical reactions inside the body's cells that generate energy from fat. Triheptanoin is a medium-chain triglyceride of three seven-carbon fatty acids designed to provide substrate replacement for both fatty acid metabolism and the Krebs cycle and restore production of energy. We have exclusively in-licensed global rights to triheptanoin from Baylor Research Institute. Triheptanoin is in an ongoing investigator-sponsored Phase 2 study, and we plan to initiate a Phase 2 study in LC-FAOD patients in early 2014.

LC-FAOD background

Without sufficient fatty acid oxidation and Krebs cycle function, LC-FAOD patients cannot rely on fatty acids for energy as would normally occur, making such patients more reliant on glucose metabolism and more susceptible to severe energy crises during periods of fasting and illness. The inability to produce energy from fat can lead to depletion of all glucose in the body, and severe liver, muscle, and heart disease. These symptoms can lead to serious hospitalizations or early death. Due to altered energy balance in skeletal muscle, many patients experience low muscle tone, weakness, exercise intolerance, muscle pain and fatigue, low-grade chronic rhabdomyolysis (muscle rupture), and severe acute episodes of rhabdomyolysis requiring hospitalization. As LC-FAOD is a known cause of sudden infant death syndrome, patients born with all types of LC-FAOD in the

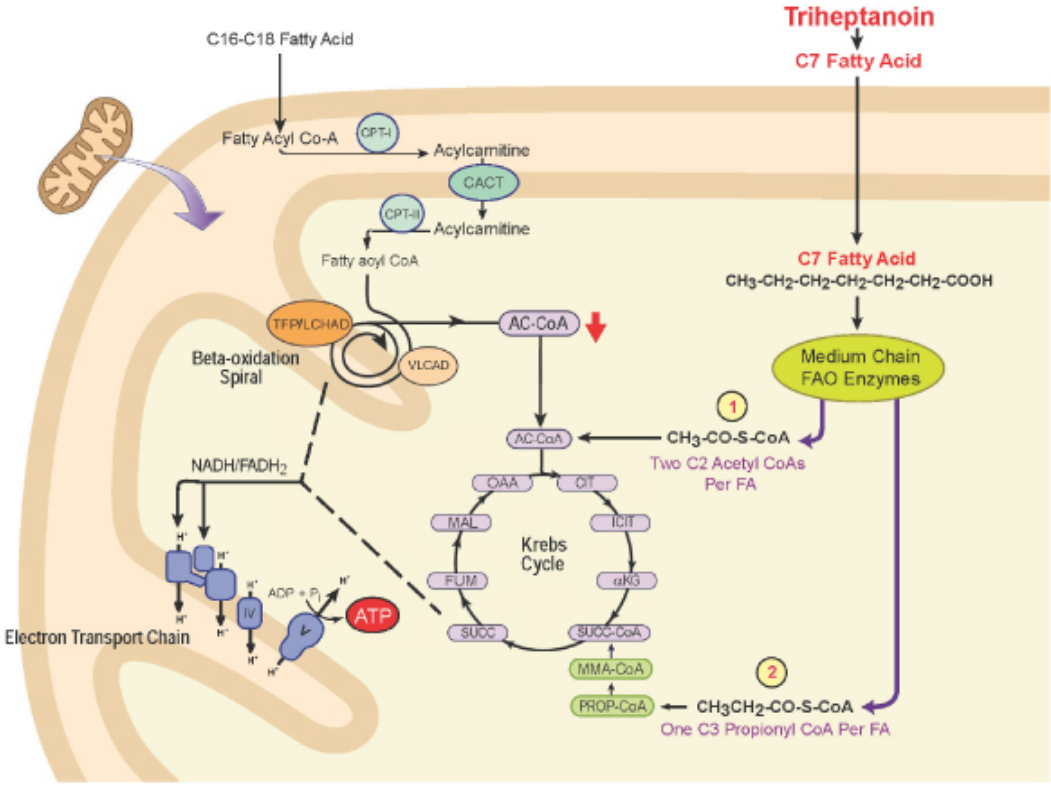
United States are now diagnosed via newborn screening in all 50 states. Outside of the United States, patients are increasingly diagnosed by newborn screening, though they can also be diagnosed as a result of symptomatic presentations such as serious liver, muscle, and heart disease.

Patients with LC-FAOD have defects in genes that code for multiple enzymes involved in converting long chains of fat into energy. LC-FAOD patients are also thought to become deficient in the intermediate compounds that are required for the normal metabolic function of the Krebs cycle. This deficiency may be caused by damage to the mitochondria due to the accumulation of long-chain fatty acids, or due to the consumption of the intermediates in the production of glucose to overcome low blood glucose levels.

There are currently no approved drugs or treatments specifically for LC-FAOD. The current standard of care for LC-FAOD includes diligent prevention of fasting combined with the use of low-fat/high-carbohydrate diets, carnitine supplementation in some cases, and medium-chain triglyceride, or MCT, oil supplementation. MCT oil has medium even-chain fatty acids that can be metabolized by medium-chain fatty acid oxidation enzymes and can bypass long-chain fatty acid oxidation enzyme blocks, but does not provide odd-chain fatty acids that can refill the Krebs cycle or be converted to new glucose. In many patients, the current standard of care, including MCT oil, does not prevent all hypoglycemic events, exercise intolerance, muscle weakness, rhabdomyolysis, and cardiomyopathy, as well as associated mortality. For example, a mortality rate of more than 50% has been observed in spite of treatment with standard of care. Major metabolic decompensations also persist despite newborn screening.

Triheptanoin background and clinical development

Triheptanoin consists of medium-length odd-chain fatty acids that should bypass blocks in the long-chain fatty acid oxidation pathway and also restore function of the Krebs cycle. Triheptanoin is converted into heptanoate and ketone bodies; once these metabolites enter the mitochondria, they are metabolized by the medium-chain oxidation enzymes, bypassing the defective long-chain enzymes. These metabolites are converted into two-carbon units (pathway 1 in the figure below) and three-carbon units (pathway 2 in the figure below) required to fuel and operate the Krebs cycle. With these two substrates entering the Krebs cycle, the energy production process can continue and generate the adenosine triphosphate, or ATP, used to support cellular metabolism.



Triheptanoin has been studied by academic researchers for over a decade in a large cohort of human FAOD subjects. Multiple investigator-sponsored open-label studies suggest clinical improvements with triheptanoin treatment, even for patients who were on standard of care. In 2006, a cumulative summary was reported for 48 FAOD subjects who were initially on standard of care but were then treated with triheptanoin, demonstrating a large decrease in liver enlargement and low blood sugar in nearly all subjects, a substantial decrease in frequency of muscle rupture, and a decrease in cardiac disease. Below is a chart summarizing the data reported in the 2006 study.

	# Symptomatic Patients	
Symptoms	**Before triheptanoin**	**After triheptanoin**
Cardiac	10	1
Muscle rupture	36	15
Weakness/fatigue	44	10
Low blood sugar	24	1
Liver enlargement	26	2
Retinopathy	3	3

Triheptanoin has been studied clinically for 13 years in approximately 130 human subjects affected by a variety of diseases, including 65 patients with LC-FAOD. Over this 13-year period, six deaths have been reported among the LC-FAOD patients, but none of these were considered by investigators to be related to triheptanoin. Triheptanoin has been generally well tolerated when administered to subjects with all subtypes of LC-FAOD. Some patients have had non-serious treatment-emergent adverse events involving the gastrointestinal, or GI, system, such as cramping, diarrhea, and loose stools. These GI side effects can be managed by slowly increasing the dose when initiating therapy and by mixing triheptanoin with food or drink, but some patients have discontinued therapy due to the GI upset. In addition, excess weight gain has been reported and can be prevented with careful monitoring of total caloric intake.

The serious adverse events reported for the 65 subjects generally involved events consistent with the underlying LC-FAOD disease, including muscle weakness or pain, myoglobinuria, or muscle protein in the urine, muscle cell rupture, metabolic crisis, cardiomyopathy, hypoglycemia and elevated creatine kinase, or CK, often in association with infections, exercise, or during periods of limited triheptanoin treatment. Other serious adverse events involved events such as infections, fever and vomiting from unspecified cause, respiratory distress/breathing problems, falling oxygen saturation rate, seizure, or medical procedures apparently unrelated to FAOD such as reaction to injection, cleft palate repair, ear tube placement, tonsillectomy/adenoidectomy, cardiac stent placement.

Only three serious adverse events (6%) were classified as possibly related to triheptanoin treatment: muscle cell rupture and elevated CK reported for two subjects, and myoglobinuria in conjunction with exercise, suboptimal triheptanoin dose, and no fluid intake reported for one subject. All three of these serious adverse events were reported during treatment with low dose triheptanoin, and these serious adverse events can be considered typical of the underlying disease.

We have completed a retrospective medical record review study to assess the clinical outcome of triheptanoin treatment on LC-FAOD subjects who have been participating in a compassionate use program at the University of Pittsburgh Medical Center. The data were presented at the 12th International Conference of Inborn Errors of Metabolism in September 2013. The study evaluated the impact of triheptanoin treatment on the rate and extent of hospitalizations in 20 of 24 patients who have been treated with triheptanoin for up to 13 years as part of compassionate use and who consented to be part of the study. The study involved an intensive medical

record collection and review of patients to capture major medical events available, during the period before and after initiation of treatment until the present time. A total of 120 individual charts were evaluated, which covered 241 years of patient data and included a total of 319 hospitalizations. The study compared the major medical event rate before and after initiation of triheptanoin treatment including the total number of hospitalizations and hospital days per year due to all causes, muscle rupture, hypoglycemia, or cardiomyopathy. The total number of events or hospital days for each patient was divided by the total number of years pre-treatment or post-treatment initiation to calculate an annual rate. The preliminary results of our retrospective medical record review are as follows:

Description	Pre-treatment	Post-treatment	% decrease	n	p-value
Mean total hospitalizations/year(1)	1.94	1.26	36%	16	0.1126
Mean total hospital days/year(1),(2)	17.55	5.4	69%	15	0.0242
Mean infant total hospitalizations/year(3)	13.01	1.37	89%	4	0.0892
Mean hypoglycemia events/year(1),(4)	0.92	0.04	96%	9	0.0091
Mean hypoglycemia total hospital days/year(1),(2),(4)	8.42	0.18	98%	9	0.0257
Mean rhabdomyolysis events/year(1),(5)	1.05	0.68	35%	11	0.4604
Mean rhabdomyolysis total hospital days/year(1),(5)	5.94	2.16	64%	9	0.1224
Mean peak creatine kinase (units) for rhabdomyolysis events(1),(5)	85,855	25,797	68%	7	0.1279

(1) Excludes data for four infants dosed within first six months of life.

(2) Excludes hospitalizations with unknown discharge dates.

(3) Four infants were dosed within the first six months of life.

(4) Includes only those patients with hypoglycemia events prior to treatment.

(5) Includes only those patients with rhabdomyolysis events prior to treatment.

We have conducted a pre-investigational new drug, or pre-IND, meeting with the FDA and agreed on the immediate non-clinical and clinical development plan. Accordingly, we can proceed with our clinical program in patients aged six months and older. An IND is in effect, which allows us to commence human clinical studies.

In early 2014, we plan to initiate a prospective open-label Phase 2 study of triheptanoin treatment in approximately 30 severely affected LC-FAOD subjects exhibiting significant clinical symptoms despite current therapy. The study will be conducted at approximately eight clinical sites in the United States and Europe. Subjects will continue current therapy for four weeks to establish their baseline condition and then begin treatment with triheptanoin. We anticipate that dosing will be gradually increased to an effective dose, expected to be 25-35% of total caloric intake, while ensuring tolerability. The subjects will be followed over 24 weeks, then may continue treatment for an additional 54 weeks. The effects of treatment on clinical and physiologic disease will be assessed in three areas: skeletal myopathy, liver disease, and cardiac disease. A principal goal of the study is to determine the appropriate clinical endpoints and patient populations for testing in potential later-stage pivotal studies.

In addition to advancing our own development program toward potential approval, we are supporting multiple compassionate use and independent investigator-sponsored clinical studies in FAOD and other indications.

Potential market opportunity

Based upon data from the National Newborn Screening Information System, we estimate that there are approximately 2,000 to 3,500 LC-FAOD patients in the United States, depending on the assumed mortality rate. It is unclear how many of these patients are currently diagnosed because the availability of newborn screening in all 50 states in the United States is a relatively new development. Furthermore, until further clinical development of triheptanoin is conducted, it is not clear which subsets of diagnosed patients would be considered by clinicians to be good candidates for triheptanoin treatment. Outside of the United States, where newborn screening is not consistently done, figures regarding the prevalence of LC-FAOD are more uncertain. To further understand the patient population, we have begun a survey of individual metabolic clinics, and to date we have individually identified over 1,300 LC-FAOD patients worldwide, including over 600 in the United States.

Triheptanoin (UX007) for the treatment of Glut1 DS

We are also developing triheptanoin for patients with glucose transporter type-1 deficiency syndrome, or Glut1 DS. Glut1 DS is caused by a mutation affecting the gene that codes for Glut1, which is a protein that transports glucose from blood into the brain. Because glucose is the primary source of energy for the brain, Glut1 DS results in a chronic state of energy deficiency in the brain. Triheptanoin in this indication is intended as a substrate replacement therapy to provide an alternative source of energy to the brain in Glut1 DS patients. We plan to initiate an adaptive 52-week Phase 2 study in Glut1 DS patients in the first half of 2014, in which the study enrollment may be adapted based on an interim analysis of efficacy and seizure reduction data. The primary efficacy objective of the study is the reduction in frequency of generalized or partial-onset seizures compared to placebo. If the magnitude of benefit is substantial, the study enrollment may increase, whereas if it is not, then the target enrollment will remain the same.

Glut1 DS background

Glut1 DS is characterized by seizures, developmental delay, and movement disorder in approximately 90%, 75%, and 90% of patients, respectively. The seizures experienced by patients with Glut1 DS can be of many types, and more than one type of seizure can occur in the same patient. In infants and young children, the phenotype is dominated by the seizure disorder and developmental delay. The majority of children with Glut1 DS experience problems with language, both in speaking and in understanding what is said to them. In older patients and in some less severe patients, motor dysfunction has been the dominant symptom.

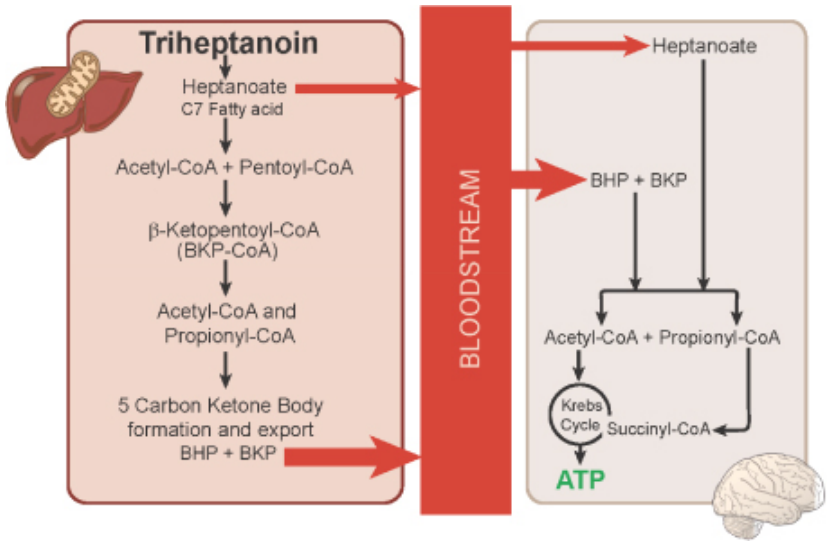
Patients are suspected of having Glut1 DS based on clinical grounds and a low cerebrospinal fluid, or CSF, glucose level. The diagnosis can be confirmed using a red cell glucose uptake test, but this test is not universally available. Currently, genetic testing is readily available and constitutes the main diagnostic test in suspected cases.

There are currently no approved drugs specific to Glut1 DS. Patients may be treated with antiepileptic drugs, or AEDs, for seizure control, although the seizures of Glut1 DS are generally considered resistant to existing AEDs. The current standard of care for Glut1 DS is the ketogenic diet, an extreme high-fat (70-80% of daily calories as fat)/low-carbohydrate diet, which generates ketone bodies as an alternative energy source to glucose. The ketogenic diet is effective in controlling or reducing the seizures of Glut1 DS in most cases. However, seizures are not controlled completely in all patients on the ketogenic diet, and many patients have difficulties fully complying with the diet. Some patients continue to have significant problems with developmental delay and motor dysfunction despite improvement in seizures. We believe that a treatment that does not require an extreme diet therapy could help reduce the burden of Glut1 DS and potentially improve the developmental and other outcomes, without the adverse effects of the diet.

Triheptanoin background and clinical development

The rationale for using triheptanoin as a therapeutic treatment for Glut1 DS is that triheptanoin is a specially designed synthetic triglyceride compound intended to provide patients with heptanoate; heptanoate can circulate and also be further metabolized to four- and five-carbon ketone bodies in the liver. These metabolites bypass the

Glut1 transporter to cross the blood-brain-barrier and provide an alternative energy source to the brain. Heptanoate also crosses the blood-brain-barrier and can be converted to glucose. As in LC-FAOD, some of these metabolites have the ability to restore proper functioning of the Krebs cycle within the brain. The following illustrates the mechanism of action of triheptanoin in the treatment of Glut1 DS.



There are a number of third-party publications on triheptanoin that provide data on its efficacy in epilepsy models and its absorption and metabolism when administered intravenously and orally at doses up to 40% of recommended daily caloric intake.

To date, there are no reports of toxicity on triheptanoin when used as an alternate source of energy in the diet. The metabolites of triheptanoin are essential as a source of energy in patients with Glut1 DS. They are therefore not expected to be toxic. Two toxicity studies have been reported in the literature; toxicities were not observed in either study, other than increased liver fat, which may have been related to high fat intake.

Triheptanoin has been studied clinically for 13 years in approximately 130 human subjects affected by a variety of diseases. Of these, 51 subjects were pediatric subjects with some as young as neonates, and 23 of the 51 pediatric subjects received over five years of treatment with triheptanoin. These data support the safety of triheptanoin when administered at approximately 35% of daily caloric intake in pediatric patients. Although an open-label investigator-sponsored clinical study is ongoing and the results have not yet been reported, there are anecdotal reports of benefit in terms of reduced seizures and improved development rate in some Glut1 DS subjects taking triheptanoin.

We are planning to initiate a clinical development program to study the effects of triheptanoin in Glut1 DS. We anticipate that the program will initially consist of a Phase 2 adaptive, randomized, double-blind, placebo-controlled, parallel-group study of at least 30 patients between three and 17 years of age inclusive who are currently not on, or not fully compliant with, ketogenic diet. Enrolled subjects will be allowed to maintain standard of care treatment with up to three AEDs and will record their generalized or partial-onset seizure frequency during the baseline period. At the end of the baseline period, eligible subjects will be randomized to either placebo or triheptanoin and will gradually increase their dose to approximately 35% of total daily calories. Subjects will then maintain a stable dose of study drug for six weeks. When 30 subjects have completed the treatment period, an independent data monitoring committee will review the efficacy and seizure reduction data to consider modifying the target patient enrollment. After the initial double-blind treatment period, the open-label extension period will begin, wherein all subjects will be treated with triheptanoin through week 52 of the study. The study will evaluate the impact of treatment with triheptanoin on seizure frequency, cognitive and other developmental delay, and movement disorder/motor abnormalities, as well as safety and tolerability. We expect to initiate this study in the first half of 2014.

Potential market opportunity

While a comprehensive genetic analysis of birth incidence has not been conducted, published literature suggests a range of 3,000 to 7,000 Glut1 DS patients in the United States based on evaluations of generalized or absence seizures. The increasing recognition of alternative or variable motor forms of the disease suggests that older patients may be discovered over time. Given that the disease can be inherited as an autosomal dominant disease, the discovery of one patient may be used to identify other affected relatives in some cases, which can be important in marketing of the product.

Our clinic survey in Glut1 DS has only recently begun. To date, we have identified over 200 individual patients worldwide, including more than 80 in the United States, and we continue to contact clinics and expand the survey.

SA-ER (UX001) for the treatment of HIBM

We are developing an extended-release, oral formulation of sialic acid, or SA-ER, for the treatment of HIBM, which is also known as GNE myopathy. Sialic acid is an essential, naturally occurring amino sugar found in humans and most organisms. SA-ER is intended as a substrate replacement therapy designed to address sialic acid deficiency and restore muscle function in HIBM patients. We are the licensee or owner of patents and patent applications relating to sialic acid and its use for HIBM. SA-ER has completed a Phase 2 clinical study and we released top-line results in December 2013. We expect to continue to evaluate SA-ER in the extension portion of the Phase 2 study during 2014 and expect data from the extension portion of the study will be available in late 2014.

HIBM background

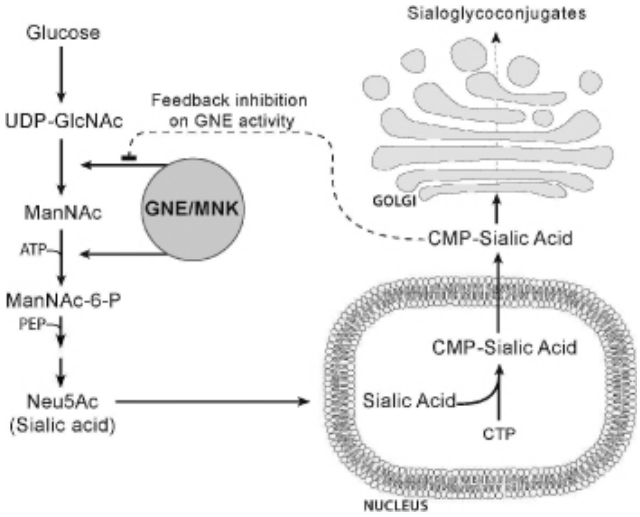
HIBM can be genetically confirmed and is characterized by severe progressive muscular myopathy, or disease in which muscle fibers do not function properly, with onset typically in the late teens or twenties. In HIBM patients, distal motor function in the legs is first affected by muscle weakness and atrophy but nearly all muscles become progressively weaker, leading to patients becoming wheelchair bound within ten to twenty years from onset. Although all muscles in HIBM patients are generally affected to some degree, the quadriceps and certain facial and diaphragm muscles may be relatively spared from severe disease. Diagnosis of HIBM typically takes place via assessment of clinical presentation and muscle biopsy.

Patients with HIBM have a genetic defect in the gene coding for a particular enzyme. The enzyme is involved in the first step in the biosynthesis of sialic acid, which is required for the glycosylation of proteins and lipids. Therefore, patients with these mutations typically have a sialic acid deficiency. Sialic acid is needed for many proteins and lipids in the body for normal function. In patients with HIBM, a partial deficiency of this enzyme leads to a sialic acid deficiency in the muscle, which interferes with muscle function, leading to myopathy and atrophy.

There is no approved drug therapy for HIBM. Patients typically become wheelchair-bound within ten to 20 years from onset.

SA-ER background and clinical development

SA-ER is designed to replace deficient sialic acid in HIBM patients. The underlying pathophysiology of HIBM has been subject to some debate, whereby it has been hypothesized that the deficient enzyme may have functions other than sialic acid biosynthesis. However, no alternative functions have been definitively established, and subsequent studies have shown that sialic acid substrate replacement in mouse models has profound beneficial effects on the phenotype with little residual clinical disease or pathology remaining after treatment. Therefore, we believe that sialic acid biosynthesis is a key function of the deficient enzyme, and we do not anticipate that theories regarding other functions of the deficient enzyme will impact our SA-ER development program. The following graphic illustrates the biosynthetic pathway of sialic acid in the body.



We have conducted a Phase 1 single-dose and repeat-dose safety and pharmacokinetics study of SA-ER in 26 HIBM patients at doses up to six grams per day. No serious adverse events were reported in the study, and adverse events were considered mild to moderate. SA-ER was absorbed and provided steady and significant drug levels over a period of 8–16 hours, depending on the dose level, regardless of inter-patient variability in the degree of absorption. At the six-gram per day repeat dose, taking SA-ER with food seemed to extend the time period in terms of elevated drug levels. At higher dose levels, mean sialic acid concentrations reached levels that were two to three times normal sialic acid levels.

We have conducted a Phase 2 randomized, double-blind, placebo-controlled study testing SA-ER for safety, pharmacodynamics and efficacy in 46 HIBM patients. The primary objective of the Phase 2 study was to evaluate safety, dose, and potential pharmacodynamic effect of restoring sialylation of muscle in patients with a confirmed genetic mutation for HIBM. The study also evaluated clinical measures of muscle strength, mobility, function, self-reported disability, and changes in quality of life. Patients were randomized to receive placebo, 3 grams, or 6 grams per day of SA-ER. At 24 weeks, placebo patients were randomized and crossed over into either of the two dose groups on a blinded basis and followed for an additional 24 weeks.

An interim analysis of the Phase 2 study was performed following 24 weeks of treatment. The data showed modest dose-dependent improvement in muscle strength compared to declines in placebo-treated subjects in some muscle groups, particularly in the upper extremities at the 6-gram dose. Similar to the results observed at the 24-week interim analysis, at 48 weeks the comparison of the upper extremity composite of muscle strength for the combined group of patients on 6 grams showed a modest increase and a statistically significant difference relative to the decline in strength observed in the combined groups on 3 grams. In the 6-gram cohort treated for 48 weeks, the modest increase in upper extremity strength observed at 24 weeks was sustained relative to a further decline in the comparable 3-gram group. These changes were more pronounced in those patients that have less advanced disease as assessed by a greater walking ability at baseline, a predefined subset. The lower

extremity composite did not show a statistically significant difference between the dose groups, but neither group showed a significant decline during the treatment period. The upper extremity and lower extremity composites are predefined endpoints that aggregate change in muscle strength across multiple individually measured muscle groups.

The GNE Myopathy Functional Activity Scale, a patient-reported outcome measure developed to assess the clinical meaningfulness of changes in function, showed a trend toward a positive effect in the combined 6-gram group as compared to the combined 3-gram group. The sit-to-stand test also showed a trend toward a positive effect. Other clinical endpoints related to walking, including the six-minute walk test did not reveal significant changes in function, upward or downward. SA-ER appeared to be well tolerated with no serious adverse events observed to date in either dose group. Most adverse events were mild to moderate and most commonly gastrointestinal. A detailed presentation or publication of the 24- and 48-week data is expected in 2014. Following the 48-week analysis, we plan to continue to treat these patients in an extension study with an increased dosage of 12 grams based on the dose dependence observed at weeks 24 and 48. All 46 patients from the original study have elected to continue into the extension study, and approximately 10 new treatment-naïve patients will also be enrolled. Patients will receive 6 grams of SA-ER tablets plus 6 grams of an immediate-release capsule formulation of sialic acid per day. We anticipate that data from the extension study should be available in late 2014. We are also pursuing development of preclinical prodrugs of sialic acid, which may have better absorption into muscle tissue.

We have also initiated a disease monitoring program that is intended to improve the body of knowledge about HIBM and its typical course. This program is being conducted in partnership with the University of Newcastle's TREAT-NMD organization, a global neuromuscular physician network in Newcastle, England. The program is designed to integrate an online registry capturing patient-reported information, a fully monitored physician-driven natural history study, and potentially any post-approval patient follow-up into a single cohesive program.

Potential market opportunity

Approximately 400 HIBM cases have been reported in the published literature. HIBM is expected to occur in one in every 1,600 persons of Persian Jewish descent. Patients have also been identified in Asian Indian, European, Chinese, Japanese, Korean, and Middle Eastern populations. To better understand the patient population, we conducted an initial survey of 420 myopathy clinics in the United States, and the extrapolated results suggest a patient population of 300 to 400 in the United States and 1,200 to 2,000 worldwide. Our recent patient identification efforts have resulted in over 300 HIBM patients in the United States to date, and over 800 worldwide.

Competition

The commercialization of new drugs is competitive, and we may face worldwide competition from individual investigators, major pharmaceutical companies, specialty pharmaceutical companies, biotechnology companies, nutraceutical companies, and ultimately biosimilar and generic companies. Our competitors may develop or market therapies that are more effective, safer, or less costly than any that may be commercialized by us, or may obtain regulatory approval for their therapies more rapidly than we may obtain approval for ours.

The acquisition or licensing of pharmaceutical products is also very competitive, and a number of more established companies, which have acknowledged strategies to license or acquire products, may have competitive advantages as may other emerging companies taking similar or different approaches to product acquisitions. These established companies may have a competitive advantage over us due to their size, cash flows, and institutional experience.

With respect to KRN23, although we are not aware of any other products currently in clinical development for the treatment of XLH, it is possible that competitors may produce, develop, and commercialize therapeutics, or utilize other approaches such as gene therapy, to treat XLH. Most pediatric patients with XLH are managed using oral phosphate replacement and vitamin D therapy, which is relatively inexpensive and therefore may adversely affect our ability to commercialize KRN23, if approved, in some countries.

With respect to rhGUS and rhPPCA, we are not aware of any other compounds currently in clinical development for MPS 7 or galactosialidosis, but it is possible that other companies may produce, develop, and commercialize compounds that might treat these diseases. Additionally, gene therapy and other therapeutic approaches may emerge for the treatment of lysosomal diseases. Bone marrow or stem cell transplants have also been used in MPS 7 and in other lysosomal storage diseases and represent a potential competing therapy. Stem cell transplants have been effective in treating soft tissue storage and in having an impact on brain disease, but have not to date proven effective in treating bone and connective tissue disease. Enzyme replacement therapy can have an impact on bone and connective tissue disease if patients are treated early.

With respect to triheptanoin, there are currently no approved drugs or treatments for patients with LC-FAOD or Glut1 DS. LC-FAOD is commonly treated with diet therapy and medium chain triglycerides, and triheptanoin would compete with MCT. Glut1 DS is commonly treated with ketogenic diet and anti-epileptic drugs. Triheptanoin may compete with these approaches, though it may also be used in combination. Although we believe that triheptanoin should be considered a drug and will be regulated that way, it is possible that other companies or individuals may attempt to produce triheptanoin for use by LC-FAOD, Glut1 DS, and other patients by attempting to sell the product via a nutraceutical or food pathway. It is also possible that other companies may produce, develop, and commercialize other medium-chain odd-chain fatty acids, or completely different compounds, to treat LC-FAOD and Glut1 DS. For example, B. Braun Medical Inc., or B. Braun, has applied for and received orphan drug designation for triheptanoin in Europe; we are not, however, aware of any ongoing development activities by B. Braun. Other companies may also utilize other approaches, such as gene therapy, to treat LC-FAOD and Glut1 DS.

With respect to SA-ER, although there are currently no approved drug therapies for the treatment of HIBM, it is possible that others may develop alternative approaches to the treatment of HIBM, including other metabolites from the sialic acid pathway, prodrugs, other drug therapies, and gene therapy. We are aware of a program at the National Institutes of Health that is investigating the use of another metabolite in the sialic acid pathway, N-acetyl mannosamine, or ManNAc, for the treatment of HIBM. This program is licensed to New Zealand Pharma, which manufactures ManNAc. The program recently completed a Phase 1 clinical study, and we anticipate that it will advance into Phase 2 testing.

Many of our competitors have substantially greater financial, technical, and human resources than we have. Additional mergers and acquisitions in the pharmaceutical industry may result in even more resources being concentrated in our competitors. Competition may increase further as a result of advances made in the commercial applicability of technologies and greater availability of capital for investment in these fields. Our success will be based in part on our ability to build and actively manage a portfolio of drugs that addresses unmet medical needs and creates value in patient therapy.

License Agreements

Kyowa Hakko Kirin

In August 2013, we entered into a collaboration and license agreement with Kyowa Hakko Kirin Co., Ltd., or KHK, pursuant to which we and KHK will collaborate on the development and commercialization of certain products containing KRN23, an antibody directed towards FGF23, in the field of orphan diseases in the United States and Canada, or the profit share territory, and in the European Union, Switzerland, and Turkey, or the European territory, and we will have the right to develop and commercialize such products in the field of orphan diseases in Mexico and Central and South America, or Latin America. Under the agreement, we also have a right of first negotiation with KHK to receive a license to develop and commercialize products in any non-diagnostic field, or in the field of orphan drugs outside of the profit share territory, the European territory, and Latin America.

In the field of orphan diseases, and except for ongoing studies being conducted by KHK, we will be the lead party for development activities in the profit share territory and in the European territory until, with respect to the profit share territory, the fifth anniversary of the first commercial sale in the United States in the first indication and, with respect to the European territory, the date on which marketing approval for a licensed product for the first indication is obtained in the European territory on a country-by-country basis; each such date is referred to herein as the applicable transition date. We will share the costs for development activities in the profit share

territory and European territory conducted pursuant to the development plan before the applicable transition date equally with KHK. On the applicable transition date in the relevant territory, KHK will become the lead party and be responsible for these costs. However, we will continue to share the costs of the studies commenced prior to the applicable transition date equally with KHK. While we are the lead development party in the profit share territory, we must use commercially reasonable efforts to conduct development activities in at least one orphan disease indication other than XLH, as mutually agreed upon by KHK and us.

In the profit share territory, KHK will book sales of products and we will have the sole right to promote the products for a specified period of time, with KHK increasingly participating in the promotion of the products until five years from commercial launch, after which KHK will have the sole right to promote the products, subject to a limited promotion right retained by us. In the European territory, KHK will book sales of products and have the sole right to promote and sell the products. In Latin America, we will book sales of products and have the sole right to promote and sell the products.

The profit or loss from commercializing products in the profit share territory until the applicable transition date will be shared between us and KHK on a 50/50 basis. Thereafter, we will be entitled to receive a tiered double-digit revenue share in the mid to high twenty percent range in the profit share territory, intended to approximate the profit share. We will also be entitled to receive a royalty of up to 10% on net sales in the European territory. In Latin America, we will pay to KHK a low single-digit royalty on net sales. Our and KHK's obligations to pay royalties will continue on a country-by-country basis for so long as we or KHK, as applicable, are selling products in such country.

KHK will supply all quantities of product for clinical studies. KHK will also supply all quantities of product for commercial sales in the profit share territory and in Latin America. The supply price to us for commercial sales in the profit share territory and in Latin America will be determined based on a fixed percentage of net sales.

The collaboration and license agreement will continue for as long as products in the field of orphan diseases are sold in the profit share territory, European territory, or Latin America, unless the agreement is terminated in accordance with its terms.

KHK may terminate the entire agreement if we do not timely initiate a first pediatric study in XLH. In addition, KHK may terminate the agreement in certain countries or territories based upon our failure to meet certain milestones. Specifically, if we do not obtain U.S. or European marketing approval of KRN23 for the treatment of XLH by a certain date, or make a first commercial sale, on a country-by-country basis, in Latin America by certain deadlines, KHK may terminate the agreement only with respect to the applicable territory or country in which the milestone was not timely met. In certain circumstances, we have the right to obtain an extension of the applicable deadline by making a payment to KHK in the low single-digit to low double-digit millions of dollars, depending on the milestone. Also, in the event of the occurrence of certain excusable delays, the deadline for meeting the applicable milestone above is extended to account for the period of the delay. Furthermore, either party may terminate the agreement for the material breach or bankruptcy of the other party. In any event of termination by KHK, unless such termination is the result of KHK's termination for certain types of breach of the agreement by us, we may receive low single-digit to low double-digit royalties on net post-termination sales by KHK in one or more countries or territories, the amount of which varies depending on the timing of, and reason for, such termination. In any event of termination, our rights to KRN23 under the agreement and our obligations to share development costs will cease, and the program will revert to KHK, worldwide if the agreement is terminated as a whole or solely in the terminated countries if the agreement is terminated solely with respect to certain countries.

Saint Louis University

In November 2010, we entered into a license agreement with Saint Louis University, or SLU, wherein SLU granted us certain exclusive rights to intellectual property related to GUS. Under the terms of the license agreement, SLU granted us an exclusive worldwide license to make, have made, use, import, offer for sale, and sell therapeutics related to SLU's beta-glucuronidase product, such as our rhGUS product candidate, for use in the treatment of human diseases. Under this agreement, we agreed to use best efforts to develop and commercialize a licensed product as soon as practicable consistent with sound and reasonable business practices and judgment.

Under the license agreement, we paid SLU an up-front fee of $10,000, which was recorded as a research and development expense. We will make a milestone payment of $100,000 upon approval of a glucuronidase-based enzyme therapy for treatment of MPS 7. Additionally, upon reaching a certain level of cumulative worldwide sales of the product, we will pay to SLU a low single-digit royalty on net sales of the licensed products in any country or region, subject to certain potential deductions. Our obligation to pay royalties to SLU continues on a country-by-country basis until the expiration of the last-to-expire licensed patent covering the product in such country or, in the United States, Japan, and the European Union, until the later expiration of any orphan drug exclusivity. We may deduct a portion of the royalty owed if a third-party license is required. We may terminate the agreement for convenience at any time and SLU may terminate the agreement for our material breach, bankruptcy, or challenge of the licensed patents or technology, and SLU may terminate the agreement or render our license non-exclusive if we fail to meet our diligence obligations. Unless terminated as set forth above, this license agreement continues in full force and effect until the latest of expiration of the last patent based on technology licensed under the agreement, at which point our license becomes fully paid.

St. Jude Children's Research Hospital

In September 2012, we entered into a license agreement with St. Jude Children's Research Hospital, or St. Jude, wherein St. Jude granted us certain exclusive rights to intellectual property related to rhPPCA. Under the terms of the license agreement, St. Jude granted us an exclusive license under certain know-how to research, develop, make, use, offer to sell, import, and otherwise commercialize and exploit certain PPCA protein products to treat, prevent, and/or diagnose galactosialidosis and other monogenetic diseases. We agreed to make commercially reasonable efforts to develop and commercialize at least one licensed product.

Under the license agreement, we paid St. Jude an up-front fee of $10,000, which was recorded as research and development expense. Additionally, we will pay to St. Jude a royalty of less than 1% on net sales of these products for so long as such products retain orphan drug exclusivity, on a country-by-country basis. We also received a right of first negotiation to receive an exclusive license under patents and know-how related to other uses of these products. We may terminate the agreement for convenience at any time and St. Jude may terminate the agreement for our material breach of the agreement. Unless terminated for convenience or material breach, as applicable, this license agreement continues in full force and effect, until our royalty obligations expire, at which point our license becomes irrevocable, perpetual, fully paid, and royalty-free.

Baylor Research Institute

In September 2012, we entered into a license agreement with Baylor Research Institute, or BRI, whereby we exclusively licensed certain intellectual property related to triheptanoin for North America and paid BRI an up-front fee of $250,000. The license includes patents, patent applications, know-how, and intellectual property related to the composition and formulation of triheptanoin as well as its use in treating a number of orphan diseases, including FAOD. The license grant includes the sole right to develop, manufacture, and commercialize licensed products for all human and animal uses. In June 2013, we exercised our option to license this intellectual property outside of North America and paid BRI the $750,000 fee associated with this option exercise. Under the license agreement, we are obligated to use commercially reasonable efforts to develop and commercialize licensed products in select orphan indications. If we fail to meet our diligence obligations with respect to a specified orphan indication or set of orphan indications, BRI may convert our license to a non-exclusive license with respect to such orphan indication or set of orphan indications until we receive regulatory approval for licensed products in the applicable orphan indication or set of orphan indications. We are also obligated to pay a mid-single digit royalty on net sales to BRI, subject to certain reductions and offsets. Our obligation to pay royalties to BRI continues on a licensed product-by-licensed product and country-by-country basis until the later of the expiration of the first regulatory exclusivity granted with respect to such product in such country or the expiration of the last-to-expire licensed patent claiming such product in such country, in each case in connection with approval in such country for FAOD or an orphan disease covered by our license from BRI. We may make future payments of up to $10.5 million contingent upon attainment of certain development milestones and $7.5 million if certain sales milestones are achieved. We may terminate the agreement for convenience at any

time and either we or BRI may terminate the agreement for the material breach or bankruptcy of the other party. If we terminate for BRI's breach or bankruptcy, our license from BRI will remain in effect, subject to our continued payment of reduced milestones and royalties. Unless terminated for convenience or material breach or bankruptcy, as applicable, this license agreement continues in full force and effect, on a product-by-product and country-by-country basis, until our royalty obligations expire, at which point our license from BRI with respect to such product in such country becomes irrevocable, perpetual, fully paid and royalty-free.

Nobelpharma

In September 2010, we entered into a collaboration and license agreement with Nobelpharma Co., Ltd., or Nobelpharma. Under the terms of the collaboration and license agreement, each party granted the other party a worldwide exclusive license under certain of that party's intellectual property related to the compound identified as N-acetylneuraminic acid, also known as sialic acid, to develop, manufacture, and commercialize products. Nobelpharma's licensed territory includes Japan and certain other Asian countries, and our licensed territory includes the rest of the world. The parties conduct development independently, and each party is obligated to make commercially reasonable efforts to file an investigational new drug application for licensed products in its territory and, in our case, to obtain patent term extensions and data exclusivity in Europe and North America, and share with the other party all data, documentation, and information that is generated in conducting such activities. Nobelpharma must use commercially reasonable efforts to supply us with the sialic acid drug substance. Either Nobelpharma or we can terminate this supply arrangement for convenience, at which point Nobelpharma would provide technical assistance to allow us to manufacture the sialic acid drug substance ourselves. If we choose to manufacture the sialic acid drug substance, Nobelpharma will have the right to purchase the sialic acid drug substance from us and we will use commercially reasonable efforts to supply Nobelpharma with the sialic acid drug substance.

Under the collaboration and license agreement, we have paid Nobelpharma approximately $110,000 as an upfront fee and approximately $495,000 in development milestone payments and also issued 76,567 shares of common stock to Nobelpharma. We are required to pay Nobelpharma a high single digit royalty on net sales of products in our territory and Nobelpharma is required to pay us a mid-single digit royalty on net sales in their territory (with the exception of Japan). Each party's obligation to pay royalties is subject to certain offsets and deductions, and is payable on a product-by-product and country-by-country basis until the expiration of the collaboration and license agreement. In addition, as of September 30, 2013, we are obligated to make a future payment to Nobelpharma of ¥200 million (approximately $2.0 million U.S. dollars) based upon achievement of a certain approval milestone. Either party may terminate the agreement for the material breach or bankruptcy of the other party. If either party terminates the agreement, the terminating party's license will become irrevocable and royalty-free. Unless terminated for material breach or bankruptcy, as applicable, this license agreement continues in full force and effect, on a country-by-country basis, until the date of the first launch of a generic product of the licensed product in a country.

AAI Pharma

In March 2011, we entered into a license agreement with AAIPharma Services Corp., or AAI Pharma. Under the terms of this license agreement, AAI Pharma granted us a fully paid-up, royalty-free, exclusive, perpetual, and irrevocable license to research, develop, make, have made, use, import, offer for sale, and sell products incorporating AAI Pharma's controlled release matrix solid dose oral tablet technology for use in connection with sialic acid for the treatment of HIBM or distal myopathy with rimmed vacuoles. Under the license agreement, we will pay a mid-single digit percentage of any sublicense revenue received by us related to the sublicense of AAI Pharma technology. As consideration, we agreed to provide preclinical and clinical data to AAI Pharma. AAI Pharma is responsible for patent prosecution and maintenance, subject to our right to review and comment on such prosecution and maintenance. We may terminate the agreement for convenience at any time and either party may terminate the agreement for the material breach or bankruptcy of the other party.

HIBM Research Group

In April 2012, we entered into an exclusive license agreement with HIBM Research Group, or HRG, wherein HRG granted us an exclusive, worldwide license to certain intellectual property related to the treatment of HIBM and related conditions using substrate replacement therapy.

Under the terms of license agreement, we paid HRG an up-front fee of $25,000, which was recorded as a research and development expense. We will make future payments contingent upon attainment of various development and approval milestones of up to $300,000 in the aggregate. Additionally, we will pay to HRG a royalty of less than 1% of net sales of products, if any. Our obligation to pay royalties to HRG continues on a product-by-product and country-by-country basis until the expiration of the last-to-expire licensed patent claiming such product in such country, or the later expiration of orphan drug exclusivity in certain countries. We are obligated to make commercially reasonable efforts to develop and commercialize a substrate replacement therapy for HIBM. We may terminate the agreement for convenience at any time and either party may terminate the agreement for the material breach or bankruptcy of the other party. We must also terminate the agreement if we terminate our HIBM substrate replacement therapy program. Unless terminated for convenience, for our termination of our HIBM substrate replacement therapy program, or for material breach or bankruptcy, as applicable, this license agreement continues in full force and effect, on a product-by-product and country-by-country basis, until the expiration date of the last-to-expire licensed patent claiming such product in such country, or the later expiration of orphan drug exclusivity in certain countries, at which point our license becomes irrevocable, perpetual, fully paid, and royalty-free.

Patents and Proprietary Rights

The proprietary nature of, and protection for, our product candidates, processes, and know-how are important to our business. Our success depends in part on our ability to protect the proprietary nature of our product candidates, technology, and know-how, to operate without infringing on the proprietary rights of others, and to prevent others from infringing our proprietary rights. We seek patent protection in the United States and internationally for our product candidates and other technology. Our policy is to patent or in-license the technology, inventions and improvements that we consider important to the development of our business. In addition to patent protection, we intend to use other means to protect our proprietary rights, including pursuing marketing or data exclusivity periods, orphan drug status, and similar rights that are available under regulatory provisions in certain countries, including the United States, Europe, Japan, and China. See “U.S. Government Regulation — Orphan Designation and Exclusivity,” “U.S. Government Regulation — Pediatric Studies and Exclusivity,” “U.S. Government Regulation — Patent Term Restoration,” “U.S. Government Regulation — Biosimilars and Exclusivity,” “U.S. Government Regulation — Abbreviated New Drug Applications for Generic Drugs,” “U.S. Government Regulation — Hatch-Waxman Patent Certification and the 30-Month Stay,” and “European Union/Rest of World Government Regulation — Orphan Designation and Exclusivity” below for additional information.

We also rely on trade secrets, know-how, and continuing innovation to develop and maintain our competitive position. We cannot be certain 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 granted to us in the future will be commercially useful in protecting our technology.

We seek regulatory approval for our products in disease areas with high unmet medical need, great market potential, and where we have a proprietary position through patents covering various aspects of our products, such as composition, dosage, formulation, use, and manufacturing process, among others. Our success depends on an intellectual property portfolio that supports our future revenue streams and erects barriers to our competitors. We are maintaining and building our patent portfolio through filing new patent applications, prosecuting existing applications, and licensing and acquiring new patents and patent applications.

Despite these measures, any of our intellectual property and proprietary rights could be challenged, invalidated, circumvented, infringed or misappropriated, or such intellectual property and proprietary rights may not be sufficient to permit us to take advantage of current market trends or otherwise to provide competitive advantages. For more information, please see “Risks Related to our Intellectual Property.”

As of January 10, 2014, we own 11 pending U.S. patent applications and corresponding patents and patent applications internationally. In addition, as of January 10, 2014, we have licensed 10 issued U.S. patents and 13 pending U.S. patent applications as well as corresponding foreign patents and applications from third parties, on an exclusive basis. With respect to our issued patents in the United States and Europe, we are also entitled to obtain a patent term extension to extend the patent expiration date. For example, in the United States, we can apply for a patent term extension of up to five years for one of the patents covering a product once the product is approved by the FDA. The exact duration of the extension depends on the time we spend in clinical studies as well as getting a new drug application approval from the FDA. The patent portfolios for our five leading product candidates as of January 10, 2014 are summarized below.

KRN23

We have rights from KHK to patents and patent applications relating to KRN23, a fully human monoclonal antibody against FGF23, and its use for the treatment of XLH and various other hypophosphatemic conditions. Pursuant to this license, we share rights to 20 issued patents, including 3 U.S. patents and 1 pending U.S. application and patents and applications in other jurisdictions covering generic and specific antibodies against FGF23 as well as their use for the treatment of XLH and related conditions. The patent terms for issued patents in the United States are from 2022 to 2029 (without patent term extension). The projected patent term for pending applications in the United States is 2028. We intend to pursue marketing and orphan drug exclusivity periods that are available to us under regulatory provisions in certain countries. KRN23 has received orphan drug designation in the United States.

rhGUS

We have no issued patents covering rhGUS but we are in the process of filing patent applications directed to compositions with certain characteristics that are useful for the enzyme replacement therapy for the treatment of multi-system lysosomal storage disease. Throughout clinical research and development, we also intend to file patent applications directed to various aspects of the treatment therapy including dosage, regiment, formulation, manufacturing, etc. We intend to pursue marketing and orphan drug exclusivity periods that are available under regulatory provisions in certain countries. rhGUS has received orphan drug designation in both the United States and Europe.

rhPPCA

We have no issued patents or patent applications filed for rhPPCA, although it is partially protected by proprietary know-how licensed from St. Jude Children’s Hospital. We intend to build a patent portfolio directed to compositions with certain characteristics that are useful for the enzyme replacement therapy for the treatment of autosomal recessive lysosomal storage disease as well as various aspects of the treatment therapy including dosage, regimen, formulation, manufacturing, etc. We intend to pursue marketing and orphan drug exclusivity periods that are available under regulatory provisions in certain countries.

Triheptanoin

We are the licensee or owner of patents and patent applications relating to triheptanoin and its use for a number of diseases including FAOD and Glut1 DS. In particular, we have an exclusive license from Baylor Research Institute, or BRI, with respect to its triheptanoin patent portfolio. We have licensed from BRI 24 issued patents, including 7 U.S. patents and 8 pending U.S. applications and patents and applications in other jurisdictions covering composition, formulation, use and manufacturing of triheptanoin and related odd carbon fatty acids. The patent terms for issued patents in the United States are from 2020 to 2024 (without patent term extension). The projected patent terms for pending applications in the United States are from 2020 to 2034. We intend to pursue marketing and orphan drug exclusivity periods that are available under regulatory provisions in certain countries.

SA-ER

We are the licensee or owner of patents and patent applications relating to sialic acid and its use for the treatment of HIBM. We have 10 pending U.S. applications and patents and applications in other jurisdictions covering the use of sialic acid for the treatment of HIBM, biomarkers useful for such treatment as well as extended release formulations of sialic acid. The projected patent terms for pending applications in the United States are from 2028 to 2034.

We intend to pursue marketing and orphan drug exclusivity periods that are available under regulatory provisions in certain countries. SA-ER has received orphan drug designation in both the United States and the European Union.

Trademarks

We have filed U.S. trademark applications for ULTRAGENYX and ULTRAGENYX PHARMACEUTICAL.

Other

We rely upon unpatented trade secrets, know-how, and continuing technological innovation to develop and maintain our competitive position. We seek to protect our ownership of know-how and trade secrets through an active program of legal mechanisms including assignments, confidentiality agreements, material transfer agreements, research collaborations, and licenses.

Manufacturing

We currently contract with third parties for the manufacturing and testing of our product candidates for preclinical studies and clinical studies and intend to do so in the future. We do not own or operate manufacturing facilities for the production of clinical quantities of our product candidates. We currently have no plans to build our own clinical or commercial scale manufacturing capabilities. The use of contracted manufacturing and reliance on collaboration partners is relatively cost-efficient and has eliminated the need for our direct investment in manufacturing facilities and additional staff early in development. Although we rely on contract manufacturers, we have personnel with extensive manufacturing experience to oversee our contract manufacturers.

To date, our third-party manufacturers have met our manufacturing requirements. We expect third-party manufacturers to be capable of providing sufficient quantities of our product candidates to meet anticipated full scale commercial demands. To meet our projected needs for commercial manufacturing, third parties with whom we currently work might need to increase their scale of production or we will need to secure alternate suppliers. We believe that there are alternate sources of supply that can satisfy our clinical and commercial requirements, although we cannot be certain that identifying and establishing relationships with such sources, if necessary, would not result in significant delay or material additional costs.

KRN23

The drug substance and drug product for KRN23 are made by KHK in Japan under the collaboration and license agreement with KHK. The cell line to produce KRN23 is specific for this product and is in KHK’s control. All other raw materials are commercially available.

rhGUS

rhGUS drug substance and drug product are manufactured by Rentschler Biotechnologie GmbH, or Rentschler, under a development and clinical supply agreement executed in August 2012. Pursuant to the supply agreement, we have agreed not to source larger quantities of drug substance or drug product from another supplier than from Rentschler in any given year. The supply agreement will continue in full force and effect until all services have been completed or terminated per the terms of the supply agreement. Either party may terminate the supply agreement if the other party fails to pay any sum payable under the supply agreement within 30 days

after a written demand is issued after the original due date, if the other party makes a material misrepresentation or commits a material breach of its obligations under the supply agreement and fails to cure such breach within specified time periods if curable, if the other party ceases to carry on its business for a period no less than 60 days, or if a party experiences certain insolvency events. Additionally, either party may terminate the supply agreement upon 30 days' prior written notice if the Steering Committee concludes that the services required under the supply agreement cannot be performed and we may terminate the agreement at any time before completion of the services rendered pursuant to the agreement upon 60 days' prior written notice. The cell line to produce rhGUS is specific for this product and is in our control and stored in multiple secure locations. All other raw materials are commercially available.

rhPPCA

No supplier has yet been selected for rhPPCA. The cell line to produce rhPPCA is specific for this product and is in our control and stored in multiple secure locations. The process to produce rhPPCA will only contain commercially available materials.

Triheptanoin

The pharmaceutical-grade drug substance for triheptanoin is manufactured by Cremer Oleo GmbH & Co. KG in Germany under an exclusive worldwide supply agreement, subject to certain limitations, executed in 2012. The supply agreement has an initial term of three years; thereafter, the agreement shall be automatically renewed for additional two-year periods unless either party notifies the other party of its intention not to renew in writing at least three calendar months before the expiration of the then current term. Additionally, if a party materially breaches an obligation under the agreement and does not cure such breach within 60 days of receiving notice of the breach from the non-breaching party, the non-breaching party may terminate the agreement immediately upon written notice to the breaching party. Triheptanoin drug product manufacturing has been done with more than one party and is not considered a very specialized task.

SA-ER

The drug substance for SA-ER is currently manufactured by Sanyo Fine Co., Ltd. in Japan through the license agreement with Nobelpharma. The SA-ER drug product is manufactured by AAI Pharma under our license agreement and accompanying purchase orders with AAI Pharma. We are in the process of identifying secondary sources of drug substance and drug product for SA-ER. Manufacture of the drug substance requires a specialized enzyme-catalyzed step, and a secondary source of the enzyme itself is also under development. All raw materials to produce the drug substance and drug product are commercially available. The cell line to produce the specialized enyme is under our contol and is stored in multiple secured locations.

Sales and Marketing

We currently intend to build the commercial infrastructure in the United States and Europe necessary to effectively support the commercialization of all of our product candidates, if and when we believe a regulatory approval of the first of such product candidates in a particular geographic market appears imminent. The commercial infrastructure for orphan products typically consists of a targeted, specialty sales force that calls on a limited and focused group of physicians supported by sales management, medical liaisons, internal sales support, an internal marketing group, and distribution support. One challenge unique to commercializing therapies for rare diseases is the difficulty in identifying eligible patients due to the very small and sometimes heterogeneous disease populations. Our management team is experienced in maximizing patient identification for both clinical development and commercialization purposes in rare diseases.

Additional capabilities important to the orphan marketplace include the management of key accounts such as managed care organizations, group-purchasing organizations, specialty pharmacies, and government accounts. To develop the appropriate commercial infrastructure, we will have to invest significant amounts of financial and management resources, some of which will be committed prior to any confirmation that any of our product candidates will be approved.

Outside of the United States and Europe, where appropriate, we may elect in the future to utilize strategic partners, distributors, or contract sales forces to assist in the commercialization of our products. In certain instances we may consider building our own commercial infrastructure.

Government Regulation

Government authorities in the United States (including federal, state, and local authorities) and in other countries, extensively regulate, among other things, the manufacturing, research and clinical development, marketing, labeling and packaging, storage, distribution, post-approval monitoring and reporting, advertising and promotion, pricing, and export and import of pharmaceutical products, such as those we are developing. 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.

U.S. Government Regulation

In the United States, the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act, or FDCA, and its implementing regulations, and biologics under the FDCA and the Public Health Service Act, or PHSA, and its implementing regulations. FDA approval is required before any new unapproved drug or dosage form, including a new use of a previously approved drug, can be marketed in the United States. Drugs and biologics are also subject to other federal, state, and local statutes and regulations. If we fail to comply with applicable FDA or other requirements at any time during the drug development process, clinical testing, the approval process or after approval, we may become subject to administrative or judicial sanctions. These sanctions could include the FDA's refusal to approve pending applications, license suspension or revocation, withdrawal of an approval, warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties or criminal prosecution. Any FDA enforcement action could have a material adverse effect on us.

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

- completion of extensive preclinical laboratory tests and preclinical animal studies, all performed in accordance with the Good Laboratory Practices, or GLP, regulations;
- submission to the FDA of an investigational new drug application, or IND, which must become effective before human clinical studies may begin and must be updated annually;
- approval by an independent institutional review board, or IRB, or ethics committee representing each clinical site before each clinical study may be initiated;
- performance of adequate and well-controlled human clinical studies to establish the safety and efficacy of the product candidate for each proposed indication;
- preparation of and submission to the FDA of a new drug application, or NDA, or biologics license application, or BLA, after completion of all pivotal clinical studies;
- potential review of the product application by an FDA advisory committee, where appropriate and if applicable;
- a determination by the FDA within 60 days of its receipt of an NDA or BLA to file the application for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facilities where the proposed product drug substance is produced to assess compliance with current Good Manufacturing Practices, or cGMP; and
- FDA review and approval of an NDA or BLA prior to any commercial marketing or sale of the drug in the United States.

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

An IND is a request for authorization from the FDA to administer an investigational new drug product to humans. The central focus of an IND submission is on the general investigational plan and the protocol(s) for human studies. The IND also includes results of animal and *in vitro* studies assessing the toxicology, pharmacokinetics, pharmacology, and pharmacodynamic characteristics of the product; chemistry, manufacturing, and controls information; and any available human data or literature to support the use of the investigational new drug. An IND must become effective before human clinical trials may begin. An IND will automatically become effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to the proposed clinical studies. In such a case, the IND may be placed on clinical hold and the IND sponsor and the FDA must resolve any outstanding concerns or questions before clinical studies can begin. Accordingly, submission of an IND may or may not result in the FDA allowing clinical studies to commence.

Clinical Studies

Clinical studies involve the administration of the investigational new drug to human subjects under the supervision of qualified investigators in accordance with current Good Clinical Practices, or cGCPs, which include the requirement that all research subjects provide their informed consent for their participation in any clinical study. Clinical studies are conducted under protocols detailing, among other things, the objectives of the study, the parameters to be used in monitoring safety, and the efficacy criteria to be evaluated. A protocol for each clinical study and any subsequent protocol amendments must be submitted to the FDA as part of the IND. Additionally, approval must also be obtained from each clinical study site's institutional review board, or IRB, before the studies may be initiated, and the IRB must monitor the study until completed. There are also requirements governing the reporting of ongoing clinical studies and clinical study results to public registries.

The clinical investigation of a drug is generally divided into three or four phases. Although the phases are usually conducted sequentially, they may overlap or be combined.

- *Phase 1*. The drug is initially introduced into healthy human subjects or patients with the target disease or condition. These studies are designed to evaluate the safety, dosage tolerance, metabolism and pharmacologic actions of the investigational new drug in humans, the side effects associated with increasing doses, and if possible, to gain early evidence on effectiveness.
- *Phase 2*. The drug is administered to a limited patient population to evaluate dosage tolerance and optimal dosage, identify possible adverse side effects and safety risks, and preliminarily evaluate efficacy.
- *Phase 3*. The drug is administered to an expanded patient population, generally at geographically dispersed clinical study sites to generate enough data to statistically evaluate dosage, clinical effectiveness and safety, to establish the overall benefit-risk relationship of the investigational new drug product, and to provide an adequate basis for product approval.
- *Phase 4*. In some cases, the FDA may condition approval of an NDA or BLA for a product candidate on the sponsor's agreement to conduct additional clinical studies after approval. In other cases, a sponsor may voluntarily conduct additional clinical studies after approval to gain more information about the drug. Such post-approval studies are typically referred to as Phase 4 clinical studies.

A pivotal study is a clinical study that adequately meets regulatory agency requirements for the evaluation of a drug candidate's efficacy and safety such that it can be used to justify the approval of the product. Generally, pivotal studies are Phase 3 studies, but the FDA may accept results from Phase 2 studies if the study design provides a well-controlled and reliable assessment of clinical benefit, particularly in situations where there is an unmet medical need and the results are sufficiently robust.

The FDA, the IRB, or the clinical study sponsor may suspend or terminate a clinical study at any time on various grounds, including a finding that the research subjects are being exposed to an unacceptable health risk.

Additionally, some clinical studies are overseen by an independent group of qualified experts organized by the clinical study sponsor, known as a data safety monitoring board or committee. This group provides authorization for whether or not a study may move forward at designated check points based on access to certain data from the study. We may also suspend or terminate a clinical study based on evolving business objectives and/or competitive climate.

The clinical study process can take three to ten years or more to complete, and there can be no assurance that the data collected will support FDA approval or licensure of the product.

Submission of an NDA or BLA to the FDA

Assuming successful completion of all required testing in accordance with all applicable regulatory requirements, detailed investigational new drug product information is submitted to the FDA in the form of an NDA or BLA requesting approval to market the product for one or more indications. Under federal law, the submission of most NDAs and BLAs is subject to an application user fee. For fiscal year 2014, the application user fee exceeds $2.1 million, and the sponsor of an approved NDA or BLA is also subject to annual product and establishment user fees, set at $104,060 per product and $554,600 per establishment. These fees are typically increased annually. Applications for orphan drug products are exempted from the NDA and BLA user fees and may be exempted from product and establishment user fees, unless the application includes an indication for other than a rare disease or condition.

An NDA or BLA must include all relevant data available from pertinent preclinical and clinical studies, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's chemistry, manufacturing, controls, and proposed labeling, among other things. Data can come from company-sponsored clinical studies intended to test the safety and effectiveness of a use of a product, or from a number of alternative sources, including studies initiated by investigators. To support marketing approval, the data submitted must be sufficient in quality and quantity to establish the safety and effectiveness of the investigational new drug product to the satisfaction of the FDA.

Once an NDA or BLA has been submitted, the FDA's goal is to review the application within ten months after it accepts the application for filing, or, if the application relates to an unmet medical need in a serious or life-threatening indication, six months after the FDA accepts the application for filing. The review process is often significantly extended by FDA requests for additional information or clarification.

Before approving an NDA or BLA, the FDA typically will inspect the facility or facilities where the product is manufactured. The FDA will not approve an application 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 an NDA or BLA, the FDA will typically inspect one or more clinical sites to assure compliance with cGCP.

The FDA is required to refer an application for a novel drug to an advisory committee or explain why such referral was not made. Typically, an advisory committee is a panel of independent experts, including clinicians and other scientific experts, that reviews, evaluates and provides 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.

The FDA's Decision on an NDA or BLA

After the FDA evaluates the NDA or BLA and conducts inspections of manufacturing facilities where the drug product and/or its drug substance will be produced, it may issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete and the application is not ready for approval. A Complete Response Letter may require additional clinical data and/or an additional pivotal Phase 3 clinical study(ies), and/or other significant, expensive and time-consuming requirements related to clinical studies, preclinical studies or manufacturing. Even if such additional information

is submitted, the FDA may ultimately decide that the NDA or BLA does not satisfy the criteria for approval. The FDA could also approve the NDA or BLA with a Risk Evaluation and Mitigation Strategy, or REMS, plan to mitigate risks, which could include medication guides, physician communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. The FDA also may condition approval on, among other things, changes to proposed labeling, development of adequate controls and specifications, or a commitment to conduct one or more post-market studies or clinical studies. Such post-market testing may include Phase 4 clinical studies and surveillance to further assess and monitor the product's safety and effectiveness after commercialization. Also, new government requirements, including those resulting from new legislation, may be established, or the FDA's policies may change, which could delay or prevent regulatory approval of our products under development.

Expedited Review and Accelerated Approval Programs

A sponsor may seek approval of its product candidate under programs designed to accelerate FDA's review and approval of NDAs and BLAs. For example, Fast Track Designation may be granted to a drug intended for treatment of a serious or life-threatening disease or condition that has potential to address unmet medical needs for the disease or condition. The key benefits of fast track designation are the eligibility for priority review, rolling review (submission of portions of an application before the complete marketing application is submitted), and accelerated approval, if relevant criteria are met. Based on results of the Phase 3 clinical study(ies) submitted in an NDA or BLA, upon the request of an applicant, the FDA may grant the NDA or BLA a priority review designation, which sets the target date for FDA action on the application at six months after the FDA accepts the application for filing. Priority review is granted where there is evidence that the proposed product would be a significant improvement in the safety or effectiveness of the treatment, diagnosis, or prevention of a serious condition. If criteria are not met for priority review, the application is subject to the standard FDA review period of ten months after FDA accepts the application for filing. Priority review designation does not change the scientific/medical standard for approval or the quality of evidence necessary to support approval.

Under the accelerated approval program, the FDA may approve an NDA or BLA on the basis of either 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. Post-marketing studies or completion of ongoing studies after marketing approval are generally required to verify the drug's clinical benefit in relationship to the surrogate endpoint or ultimate outcome in relationship to the clinical benefit. In addition, the Food and Drug Administration Safety and Innovation Act, or FDASIA, which was enacted and signed into law in 2012, established the new Breakthrough Therapy designation. A sponsor may seek FDA designation of its product candidate as a breakthrough therapy if the drug 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 may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development.

Post-Approval Requirements

Drugs manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to recordkeeping, periodic reporting, product sampling and distribution, advertising and promotion and reporting of adverse experiences with the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims are subject to prior FDA review and approval. There also are continuing, annual user fee requirements for any marketed products and the establishments at which such products are manufactured, as well as new application fees for supplemental applications with clinical data.

Drug manufacturers are subject to periodic unannounced inspections by the FDA and state agencies for compliance with cGMP requirements. Changes to the manufacturing process are strictly regulated, and,

depending on the significance of the change, may require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting and documentation requirements upon us and any third-party manufacturers that we may decide to use. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMP and other aspects of regulatory compliance.

We rely, and expect to continue to rely, on third parties for the production of clinical quantities of our product candidates, and expect to rely in the future on third parties for the production of commercial quantities. Future FDA and state inspections may identify compliance issues at our facilities or at the facilities of our contract manufacturers that may disrupt production or distribution, or require substantial resources to correct. In addition, discovery of previously unknown problems with a product or the failure to comply with applicable requirements may result in restrictions on a product, manufacturer or holder of an approved NDA or BLA, including withdrawal or recall of the product from the market or other voluntary, FDA-initiated or judicial action that could delay or prohibit further marketing. Also, new government requirements, including those resulting from new legislation, may be established, or the FDA's policies may change, which could delay or prevent regulatory approval of our products under development.

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

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- fines, warning letters or holds on post-approval clinical studies;
- refusal of the FDA to approve pending NDAs or supplements to approved NDAs, or suspension or revocation of product license approvals;
- product seizure or detention, or refusal to permit the import or export of products; or
- injunctions or the imposition of civil or criminal penalties.

The FDA strictly regulates marketing, labeling, advertising, and promotion of products that are placed on the market. Drugs may be promoted only for the approved indications and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant liability.

Orphan Designation and Exclusivity

The FDA may grant orphan drug designation to drugs intended to treat a rare disease or condition that affects fewer than 200,000 individuals in the United States, or if it affects more than 200,000 individuals in the United States, there is no reasonable expectation that the cost of developing and making the drug for this type of disease or condition will be recovered from sales in the United States.

Orphan drug designation entitles a party to financial incentives such as opportunities for grant funding towards clinical study costs, tax advantages, and user-fee waivers. In addition, if a product receives FDA approval for the indication for which it has orphan designation, the product is entitled to orphan drug exclusivity, which means the FDA may not approve any other application to market the same drug for the same indication for a period of seven years, except in limited circumstances, such as a showing of clinical superiority over the product with orphan exclusivity.

Pediatric Studies and Exclusivity

NDAs and BLAs must contain data (or a proposal for post-marketing activity) to assess the safety and effectiveness of an investigational new drug product for the claimed indications in all relevant pediatric populations in order to support dosing and administration for each pediatric subpopulation for which the drug is safe and effective. The FDA may, on its own initiative or at the request of the applicant, grant deferrals for submission of some or all pediatric data until after approval of the product for use in adults or full or partial waivers if certain criteria are met. Discussions about pediatric development plans can be discussed with the FDA at any time, but usually occur any time between the end-of-Phase II meeting and submission of the NDA or BLA. The requirements for pediatric data do not apply to any drug for an indication for which orphan designation has been granted.

Pediatric exclusivity is another type of non-patent exclusivity in the United States and, if granted, provides for the attachment of an additional six months of marketing protection to the term of any existing regulatory exclusivity, including the five-year and three-year non-patent and orphan exclusivity. This six-month exclusivity may be granted if an NDA or BLA sponsor submits pediatric data that fairly respond to a written request from the FDA for such data. The data do not need to show the product to be effective in the pediatric population studied; rather, if the clinical study is deemed to fairly respond to the FDA's request, the additional protection is granted. If reports of FDA-requested pediatric studies are submitted to and accepted by the FDA within the statutory time limits, whatever statutory or regulatory periods of exclusivity or patent protection cover the product are extended by six months. This is not a patent term extension, but it effectively extends the regulatory period during which the FDA cannot accept or approve another application relying on the NDA or BLA sponsor's data.

Patent Term Restoration

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 an NDA or BLA, plus the time between the submission date and the approval of that application. Only one patent applicable to an approved 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 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 studies and other factors involved in the filing of the relevant NDA or BLA.

Biosimilars and Exclusivity

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, or BPCI Act, 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 PHSA 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 study or studies. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product 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. 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) eighteen months after approval if there is no legal challenge, (iii) eighteen 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.

Abbreviated New Drug Applications for Generic Drugs

In 1984, with passage of the Hatch-Waxman Act, Congress authorized the FDA to approve generic drugs that are the same as drugs previously approved by the FDA under the NDA provisions of the statute. To obtain approval of a generic drug, an applicant must submit an abbreviated new drug application, or ANDA, to the agency. In support of such applications, a generic manufacturer may rely on the preclinical and clinical testing previously conducted for a drug product previously approved under an NDA, known as the reference listed drug, or RLD.

Specifically, in order for an ANDA to be approved, the FDA must find that the generic version is identical to the RLD with respect to the active ingredients, the route of administration, the dosage form, and the strength of the drug. At the same time, the FDA must also determine that the generic drug is "bioequivalent" to the innovator drug. Under the statute, a generic drug is bioequivalent to an RLD if "the rate and extent of absorption of the [generic] drug do not show a significant difference from the rate and extent of absorption of the listed drug. . . ."

Upon approval of an ANDA, the FDA indicates that the generic product is "therapeutically equivalent" to the RLD and it assigns a therapeutic equivalence rating to the approved generic drug in its publication "Approved Drug Products with Therapeutic Equivalence Evaluations," also referred to as the "Orange Book." Physicians and pharmacists consider an "AB" therapeutic equivalence rating to mean that a generic drug is fully substitutable for the RLD. In addition, by operation of certain state laws and numerous health insurance programs, the FDA's designation of an "AB" rating often results in substitution of the generic drug without the knowledge or consent of either the prescribing physician or patient.

The FDCA provides a period of five years of non-patent exclusivity for a new drug containing a new chemical entity. In cases where such exclusivity has been granted, an ANDA may not be filed with the FDA until the expiration of five years unless the submission is accompanied by a Paragraph IV certification, in which case the applicant may submit its application four years following the original product approval. The FDCA also provides for a period of three years of exclusivity if the NDA includes reports of one or more new clinical investigations, other than bioavailability or bioequivalence studies, that were conducted by or for the applicant and are essential to the approval of the application. This three-year exclusivity period often protects changes to a previously approved drug product, such as a new dosage form, route of administration, combination or indication.

Hatch-Waxman Patent Certification and the 30-Month Stay

Upon approval of an NDA or a supplement thereto, NDA sponsors are required to list with the FDA each patent with claims that cover the applicant's product or a method of using the product. Each of the patents listed by the NDA sponsor is published in the Orange Book. When an ANDA applicant files its application with the FDA, the applicant is required to certify to the FDA concerning any patents listed for the reference product in the Orange Book, except for patents covering methods of use for which the ANDA applicant is not seeking approval.

Specifically, the applicant must certify with respect to each patent that:

- the required patent information has not been filed;
- the listed patent has expired;
- the listed patent has not expired, but will expire on a particular date and approval is sought after patent expiration; or

- the listed patent is invalid, unenforceable or will not be infringed by the new product.

A certification that the new product will not infringe the already approved product's listed patents or that such patents are invalid or unenforceable is called a Paragraph IV certification. If the applicant does not challenge the listed patents or indicates that it is not seeking approval of a patented method of use, the ANDA application will not be approved until all the listed patents claiming the referenced product have expired.

If the ANDA applicant has provided a Paragraph IV certification to the FDA, the applicant must also send notice of the Paragraph IV certification to the NDA and patent holders once the ANDA has been accepted for filing by the FDA. The NDA and patent holders may then initiate a patent infringement lawsuit in response to the notice of the Paragraph IV certification. The filing of a patent infringement lawsuit within 45 days after the receipt of a Paragraph IV certification automatically prevents the FDA from approving the ANDA until the earlier of 30 months after the receipt of the Paragraph IV notice, expiration of the patent, or a decision in the infringement case that is favorable to the ANDA applicant.

European Union/Rest of World Government Regulation

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 studies and any commercial sales and distribution of our products.

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 studies 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 study application much like the IND prior to the commencement of human clinical studies. In the European Union, for example, a clinical study application, or CTA, must be submitted for each clinical protocol to each country's national health authority and an independent ethics committee, much like the FDA and IRB, respectively. Once the CTA is accepted in accordance with a country's requirements, the clinical study may proceed.

The requirements and process governing the conduct of clinical studies vary from country to country. In all cases, the clinical studies are conducted in accordance with cGCP, the applicable regulatory requirements, and the ethical principles that have their origin in the Declaration of Helsinki.

To obtain regulatory approval of an investigational medicinal product under European Union regulatory systems, we must submit a marketing authorization application. The content of the NDA or BLA filed in the United States is similar to that required in the European Union, with the exception of, among other things, country-specific document requirements.

For other countries outside of the European Union, such as countries in Eastern Europe, Latin America or Asia, the requirements governing product licensing, pricing, and reimbursement vary from country to country.

Countries that are part of the European Union, as well as countries outside of the European Union, have their own governing bodies, requirements, and processes with respect to the approval of pharmaceutical products. 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.

Authorization Procedures in the European Union

Medicines can be authorized in the European Union by using either the centralized authorization procedure or national authorization procedures.

- *Centralized procedure.* The EMA implemented the centralized procedure for the approval of human medicines to facilitate marketing authorizations that are valid throughout the European Economic Area, or EEA, which is comprised of the 28 member states of the European Union plus Norway, Iceland, and Lichtenstein. This procedure results in a single marketing authorization issued by the EMA that is valid

across the EEA. The centralized procedure is compulsory for human medicines that are: derived from biotechnology processes, such as genetic engineering, contain a new active substance indicated for the treatment of certain diseases, such as HIV/AIDS, cancer, diabetes, neurodegenerative disorders or autoimmune diseases and other immune dysfunctions, and officially designated orphan medicines.

- For medicines that do not fall within these categories, an applicant has the option of submitting an application for a centralized marketing authorization to the European Commission following a favorable opinion by the EMA, as long as the medicine concerned is a significant therapeutic, scientific or technical innovation, or if its authorization would be in the interest of public health.
- *National authorization procedures.* There are also two other possible routes to authorize medicinal products in several European Union countries, which are available for investigational medicinal products that fall outside the scope of the centralized procedure:
  - *Decentralized procedure*. Using the decentralized procedure, an applicant may apply for simultaneous authorization in more than one European Union country of medicinal products that have not yet been authorized in any European Union country and that do not fall within the mandatory scope of the centralized procedure.
  - *Mutual recognition procedure.* In the mutual recognition procedure, a medicine is first authorized in one European Union Member State, in accordance with the national procedures of that country. Following this, further marketing authorizations can be sought from other European Union countries in a procedure whereby the countries concerned agree to recognize the validity of the original, national marketing authorization.

In some cases, a Pediatric Investigation Plan, and/or a request for waiver or deferral, is required for submission prior to submitting a marketing authorization application. A PIP describes, among other things, proposed pediatric studies and their timing relative to clinical studies in adults.

New Chemical Entity Exclusivity

In the European Union, new chemical entities, sometimes referred to as new active substances, qualify for eight years of data exclusivity upon marketing authorization and an additional two years of market exclusivity. This data exclusivity, if granted, prevents regulatory authorities in the European Union from referencing the innovator's data to assess a generic (abbreviated) application for eight years, after which generic marketing authorization can be submitted, and the innovator's data may be referenced, but not approved for two years. The overall ten-year period will be extended to a maximum of eleven years if, during the first eight years of those ten years, the marketing authorization holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are held to bring a significant clinical benefit in comparison with existing therapies.

Orphan Designation and Exclusivity

In the European Union, the EMA's Committee for Orphan Medicinal Products, or COMP, grants orphan drug designation to promote the development of products that are intended for the diagnosis, prevention or treatment of life-threatening or chronically debilitating conditions affecting not more than 5 in 10,000 persons in the European Union Community and for which no satisfactory method of diagnosis, prevention, or treatment has been authorized (or the product would be a significant benefit to those affected). Additionally, 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 medicinal product.

In the European Union, orphan drug designation entitles a party to financial incentives such as reduction of fees or fee waivers and 10 years of market exclusivity is granted following medicinal product approval. This period may be reduced to six years if the orphan drug designation criteria are no longer met, including where it is shown that the product is sufficiently profitable not to justify maintenance of market exclusivity.

Orphan drug designation must be requested before submitting an application for marketing approval. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process.

Exceptional Circumstances/Conditional Approval

Orphan drugs or drugs with unmet medical needs may be eligible for EU approval under exceptional circumstances or with conditional approval. Approval under exceptional circumstances is applicable to orphan products and is used when an applicant is unable to provide comprehensive data on the efficacy and safety under normal conditions of use because the indication for which the product is intended is encountered so rarely that the applicant cannot reasonably be expected to provide comprehensive evidence, when the present state of scientific knowledge does not allow comprehensive information to be provided, or when it is medically unethical to collect such information. Conditional marketing authorization is applicable to orphan medicinal products, medicinal products for seriously debilitating or life-threatening diseases, or medicinal products to be used in emergency situations in response to recognized public threats. Conditional marketing authorization can be granted on the basis of less complete data than is normally required in order to meet unmet medical needs and in the interest of public health, provided the risk-benefit balance is positive, it is likely that the applicant will be able to provide the comprehensive clinical data, and unmet medical needs will be fulfilled. Conditional marketing authorization is subject to certain specific obligations to be reviewed annually.

Accelerated Review

Under the Centralized Procedure in the European Union, the maximum timeframe for the evaluation of a marketing authorization application is 210 days (excluding clock stops, when additional written or oral information is to be provided by the applicant in response to questions asked by the EMA's Committee for Medicinal Products for Human Use, or CHMP). Accelerated evaluation might be granted by the CHMP in exceptional cases, when a medicinal product is expected to be of a major public health interest, particularly from the point of view of therapeutic innovation. In this circumstance, EMA ensures that the opinion of the CHMP is given within 150 days, excluding clock stops.

Pharmaceutical Coverage, Pricing and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any drug products for which we obtain regulatory approval. In the United States and markets in other countries, sales of any products for which we receive regulatory approval for commercial sale will depend in part on the availability of coverage and reimbursement from third-party payors. Third-party payors include government authorities, managed care providers, private health insurers and other organizations. The process for determining whether a payor will provide coverage for a drug product may be separate from the process for setting the reimbursement rate that the payor will pay for the drug product. Third-party payors may limit coverage to specific drug products on an approved list, or formulary, which might not include all of the FDA-approved drugs for a particular indication. Moreover, a payor's decision to provide coverage for a drug product does not imply that an adequate reimbursement rate will be approved. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in product development.

Third-party payors are increasingly challenging the price and examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy. In order to obtain coverage and reimbursement for any product that might be approved for sale, we may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of our products, in addition to the costs required to obtain regulatory approvals. Our product candidates may not be considered medically necessary or cost-effective. If third-party payors do not consider a product to be cost-effective compared to other available therapies, they may not cover the product after approval as a benefit under their plans or, if they do, the level of payment may not be sufficient to allow a company to sell its products at a profit.

The U.S. government, state legislatures and foreign governments have shown significant interest in implementing cost containment programs to limit the growth of government-paid health care costs, including price controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs. By way of example, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively, the Healthcare Reform Law, contains provisions that may reduce the profitability of drug products, including, for example, increased rebates for drugs sold to Medicaid programs, extension of Medicaid rebates to Medicaid managed care plans, mandatory discounts for certain Medicare Part D beneficiaries and annual fees based on pharmaceutical companies' share of sales to federal health care programs. Adoption of government controls and measures, and tightening of restrictive policies in jurisdictions with existing controls and measures, could limit payments for pharmaceuticals.

In the European Community, governments influence the price of pharmaceutical products through their pricing and reimbursement rules and control of national health care systems that fund a large part of the cost of those products to consumers. Some jurisdictions operate positive and negative list systems under which products may only be marketed once a reimbursement price has been agreed to by the government. To obtain reimbursement or pricing approval, some of these countries may require the completion of clinical studies that compare the cost-effectiveness of a particular product candidate to currently available therapies. Other member states allow companies to fix their own prices for medicines, but monitor and control company profits. The downward pressure on health care costs in general, particularly prescription drugs, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross-border imports from low-priced markets exert a commercial pressure on pricing within a country.

The marketability of any products for which we receive regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement. In addition, an increasing emphasis on cost containment measures in the United States and other countries has increased and we expect will continue to increase the pressure on pharmaceutical pricing. Coverage policies and third-party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

Other Healthcare Laws and Compliance Requirements

If we obtain regulatory approval for any of our product candidates, we may be subject to various federal and state laws targeting fraud and abuse in the healthcare industry. These laws may impact, among other things, our proposed sales, marketing and education programs. In addition, we may be subject to patient privacy regulation by both the federal government and the states in which we conduct our business. The laws that may affect our ability to operate include:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons from knowingly and willfully soliciting, receiving, offering or paying remuneration, directly or indirectly, to induce, or in return for, the purchase or recommendation of an item or service reimbursable under a federal healthcare program, such as the Medicare and Medicaid programs;
- federal civil and criminal false claims laws and civil monetary penalty laws, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment from Medicare, Medicaid, or other third-party payers that are false or fraudulent;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created new federal criminal statutes that prohibit executing a scheme to defraud any healthcare benefit program and making false statements relating to healthcare matters;
- the federal transparency laws, including the federal Physician Payment Sunshine Act, that requires drug manufacturers to disclose payments and other transfers of value provided to physicians and teaching hospitals;

- HIPAA, as amended by the Health Information Technology and Clinical Health Act, or HITECH, and its implementing regulations, which imposes certain requirements relating to the privacy, security and transmission of individually identifiable health information; and
- state law equivalents of each of the above federal laws, such as anti-kickback and false claims laws which may apply to items or services reimbursed by any third-party payer, including commercial insurers, and state 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.

The Healthcare Reform Law broadened the reach of the fraud and abuse laws by, among other things, amending the intent requirement of the federal Anti-Kickback Statute and the applicable criminal healthcare fraud statutes contained within 42 U.S.C. § 1320a-7b, effective March 23, 2010. Pursuant to the statutory amendment, a person or entity no longer needs to have actual knowledge of this statute or specific intent to violate it in order to have committed a violation. In addition, the Healthcare Reform Law provides that the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act (discussed below) or the civil monetary penalties statute. Many states have adopted laws similar to the federal Anti-Kickback Statute, some of which apply to the referral of patients for healthcare items or services reimbursed by any source, not only the Medicare and Medicaid programs.

We are also subject to the Foreign Corrupt Practices Act, or FCPA, which prohibits improper payments or offers of payments to foreign governments and their officials for the purpose of obtaining or retaining business. Safeguards we implement to discourage improper payments or offers of payments by our employees, consultants, and others may be ineffective, and violations of the FCPA and similar laws may result in severe criminal or civil sanctions, or other liabilities or proceedings against us, any of which would likely harm our reputation, business, financial condition and result of operations.

If our operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to us, we may be subject to penalties, including civil and criminal penalties, exclusion from participation in government healthcare programs, such as Medicare and Medicaid and imprisonment, damages, fines 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.

Employees

As of December 31, 2013, we had 59 full-time employees. None of our employees is represented by labor unions or covered by collective bargaining agreements. We consider our relationship with our employees to be good.

Research and Development

We recognized $4.7 million and $12.6 million in research and development expense in the years ended December 31, 2011 and 2012, respectively, and $19.6 million in research and development expense for the nine months ended September 30, 2013.

Facilities

Our offices are located at two leased facilities: a 19,916 square foot facility in Novato, California used primarily for corporate, clinical, regulatory, manufacturing, and quality functions; and a 910 square foot facility in Novato, California used for research laboratory space. These leases expire in July 2016 and September 2014, respectively.

Legal Proceedings

We are not currently a party to any material legal proceedings.

MANAGEMENT

Executive Officers, Directors, and Key Employees

The following table sets forth information regarding our executive officers, directors and nominee for director, and key employees as of January 10, 2014:

Name	Age	Position(s)
Executive Officers		
Emil D. Kakkis, M.D., Ph.D.	53	President and Chief Executive Officer, Director
Thomas Kassberg	53	Chief Business Officer and Senior Vice President
Shalini Sharp	38	Chief Financial Officer and Senior Vice President
Non-Employee Directors and Director Nominees		
Eran Nadav, Ph.D.	44	Chairman of the Board
William Aliski	66	Director
Benjamin Auspitz[(1)]	40	Director
Mårten Steen, M.D., Ph.D.	38	Director
Matthew K. Fust[(2)]	49	Director nominee
Clay B. Siegall, Ph.D.[(2)]	53	Director nominee
Key Employees		
Michael P. Cohrs, Ph.D.	52	Vice President of Quality
John Ditton	49	Vice President, Commercial Planning
Steven Jungles	48	Senior Vice President, Technical Operations
Tony Koutsoukos, Ph.D.	53	Vice President, Biometrics
Cordelia Leonard, RAC	53	Vice President, Regulatory Affairs and Quality Assurance
Javier San Martin, M.D.	48	Vice President, Clinical Development
Vimal Srivastava	48	Vice President, Program Development
Michael Vellard, Ph.D.	52	Vice President, Research
Spencer Guthrie	38	Senior Director, Clinical Operations
Alison Skrinar	43	Senior Director, Clinical Sciences

(1) Mr. Auspitz will resign from our board of directors upon the completion of this offering.
(2) We expect that this individual will become a member of our board of directors upon the completion of this offering.

Executive Officers

Emil D. Kakkis, M.D., Ph.D. is our founder and has served as our President and Chief Executive Officer and as a member of our board of directors since inception in April 2010. Prior to Ultragenyx, Dr. Kakkis served from September 1998 to February 2009 in various executive capacities, and ultimately as Chief Medical Officer, at BioMarin Pharmaceutical Inc., a biopharmaceutical company. Dr. Kakkis also serves as President and Founder of EveryLife Foundation for Rare Diseases, a non-profit organization he started in 2009 to accelerate biotechnology innovation for rare diseases. Dr. Kakkis is board certified in both Pediatrics and Medical Genetics. He holds a B.A. in Biology from Pomona College and received combined M.D. and Ph.D. degrees from the UCLA School of Medicine's Medical Scientist Training Program and received the Bogen prize for his research. We believe that Dr. Kakkis possesses specific expert knowledge of genetics and rare diseases that qualifies him to serve on our board of directors, including his leadership, management, and operational experience in the life sciences sector.

Thomas Kassberg has served as our Chief Business Officer and Senior Vice President since November 2011. Prior to Ultragenyx, Mr. Kassberg worked as Vice President of Business Development at Corium International, Inc., a biotechnology company, from July 2010 until October 2011. Prior to his work at Corium International, Inc., Mr. Kassberg worked as an independent consultant in Corporate Development and Business Strategy and consulted with a number of companies from March 2009 to June 2010, including Corium
International, Inc. and Rib-X Pharmaceuticals, Inc., a pharmaceutical company focused on the development of

novel antibiotics. Before becoming a consultant, Mr. Kassberg worked at Proteolix, Inc., a biotechnology company subsequently acquired by Onyx Pharmaceuticals, from January 2008 until February 2009, where he served as Senior Vice President of Corporate Development. Mr. Kassberg holds a B.A. in Business Administration from Gustavus Adolphus College and an M.B.A. from Northwestern University.

Shalini Sharp has served as our Chief Financial Officer and Senior Vice President since May 2012. Prior to Ultragenyx, Ms. Sharp served in various executive capacities, and ultimately as Chief Financial Officer, of Agenus Inc., a biotechnology company, from August 2003 until May 2012. Prior to Agenus, Ms. Sharp held strategic planning and corporate finance roles and ultimately served as chief of staff to the chairman of the board at Elan Pharmaceuticals, a biotechnology company, from August 1998 to August 1999 and September 2001 to August 2003. Prior to Elan, Ms. Sharp was a management consultant at McKinsey & Company and an investment banker at Goldman Sachs, specializing in pharmaceuticals and medical devices. Ms. Sharp has also served as a board member of Agenus since May 2012. Ms. Sharp holds a B.A. and an M.B.A. from Harvard University.

Non-Employee Directors

Eran Nadav, Ph.D. has served as a member of our board of directors since June 2011 and has served as our Chairman of the board since January 2012. Dr. Nadav is a Managing Director at TPG Biotech®, the life science venture investment arm of TPG, a global private investment firm. Dr. Nadav joined TPG in 2007 with a focus on global pharmaceuticals and biotechnology investments. Prior to TPG, Dr. Nadav served as Business Development Director at Eisai, a pharmaceutical company, from September 2003 to August 2007 and also as a manager at Johnson & Johnson Development Corporation, the venture capital arm of Johnson & Johnson, a healthcare company, from November 1999 until July 2002. Dr. Nadav served on the board of directors of Eden Springs Ltd., a European provider of drinking water solutions for the workplace, from July 2010 until August 2011. Since June 2013 he has been serving on the board of directors of MacroGenics, Inc., a biopharmaceutical company. Dr. Nadav received a B.Sc. magna cum laude in Life Sciences, an M.Sc. magna cum laude and Ph.D. in Biochemistry, as well as an M.B.A., from Tel Aviv University. We believe that Dr. Nadav is qualified to serve on our board of directors due to his experience in the venture capital industry and his years of analyzing development opportunities in the life sciences sector.

William Aliski has served as a member of our board of directors since January 2011. Mr. Aliski served as a commercial consultant for early stage orphan disease companies, including Enobia Pharma, from September 2011 until March 2012. Before that, Mr. Aliski served as Senior Vice President and Chief Commercial Officer of FoldRx Pharmaceuticals, a rare disease company that is now a wholly-owned subsidiary of Pfizer Inc., from June 2009 until March 2011, as Director of Simon Kucher Partners, a global consulting firm, from January 2008 until June 2009 and as General Manager of BioMarin Europe at BioMarin Pharmaceuticals Inc. from December 2005 until January 2008. Mr. Aliski received a B.S. in Economics and a Master of Social Planning from Boston College and an M.P.A. from the Kennedy School of Government at Harvard University. We believe that Mr. Aliski is qualified to serve on our board of directors due to his extensive experience in the life sciences industry, membership of various boards of directors, and his leadership and management experience.

Benjamin Auspitz has served as a member of our board of directors since June 2011. Mr. Auspitz has served as a Partner at Fidelity Biosciences, a venture capital firm, since November 2005. Mr. Auspitz received a B.A. in Philosophy from Harvard University. We believe that Mr. Auspitz is qualified to serve on our board of directors due to his experience in the venture capital industry, membership of various other boards of directors, and his leadership and management experience.

Mårten Steen, M.D., Ph.D. has served as a member of our board of directors since June 2011. Dr. Steen has served as a Partner at HealthCap, a private equity firm, since March 2010. Prior to HealthCap, Dr. Steen served as Associate Director at Merck Serono, a biopharmaceutical company, from February 2008 until March 2010. Dr. Steen received a B.Sc. in Business Administration, an M.D. and a Ph.D. in Clinical Chemistry from Lund University. We believe that Dr. Steen is qualified to serve on our board of directors due to his medical and scientific background as well as his experience in the venture capital industry.

Matthew K. Fust joined us as a board observer in November 2013 and is expected to become a member of our board of directors upon the completion of this offering. Mr. Fust currently serves as Executive Vice President of Onyx Pharmaceuticals, Inc., a biopharmaceutical company that was recently acquired by Amgen, Inc., and has served in this position since January 2009. From May 2003 to December 2008, Mr. Fust served as Chief Financial Officer at Jazz Pharmaceuticals, Inc., a specialty pharmaceutical company. From 2002 to 2003, Mr. Fust served as Chief Financial Officer at Perlegen Sciences, a biopharmaceutical company. Previously, he was Senior Vice President and Chief Financial Officer at ALZA Corporation, a pharmaceutical company, where he was an executive from 1996 until 2002. From 1991 until 1996, Mr. Fust was a manager in the healthcare strategy practice at Andersen Consulting. Mr. Fust serves on the Board of Directors of Sunesis Pharmaceuticals, Inc., a biopharmaceutical company. Mr. Fust received a B.A. from the University of Minnesota and an M.B.A. from the Stanford Graduate School of Business. We believe that Mr. Fust is qualified to serve on our board of directors due to his extensive experience in the life sciences industry, his leadership and management experience, and his service as a director of another public biopharmaceutical company.

Clay B. Siegall, Ph.D. joined us as a board observer in January 2014 and is expected to become a member of our board of directors upon the completion of this offering. Dr. Siegall currently serves as President and Chief Executive Officer and Chairman of the Board of Seattle Genetics, Inc., a biotechnology company. Dr. Siegall co-founded Seattle Genetics in 1998. Prior to Seattle Genetics, Dr. Siegall worked for the Bristol-Myers Squibb Pharmaceutical Research Institute from 1991 to 1997 and the National Cancer Institute, National Institutes of Health from 1988 to 1991. In addition to Seattle Genetics, Dr. Siegall serves as a director of Alder BioPharmaceuticals, Inc., a privately-held biotechnology company and Mirna Therapeutics, Inc., a privately-held biotechnology company. Dr. Siegall received a B.S. in Zoology from the University of Maryland and a Ph.D. in Genetics from George Washington University. We believe that Dr. Siegall is qualified to serve on our board of directors due to his extensive experience in the life sciences industry and his leadership and management experience.

Key Employees

Michael P. Cohrs, Ph.D. has served as our Vice President of Quality since December 2013 and is responsible for overseeing our GMP, GLP, GCP, and Clinical Assay departments. Prior to Ultragenyx, Dr. Cohrs served as Senior Director of Quality Assurance/Quality Control at Medicines 360, a pharmaceutical company, from October 2012 through November 2013 and previously served as the Director of Quality Assurance at Medicines 360 from September 2009 through October 2012. Prior to Medicines 360, Dr. Cohrs served as the Director of Quality Assurance at Sunesis Pharmaceuticals Inc., a pharmaceutical company, from June 2007 to June 2008. Dr. Cohrs has also held increasingly responsible positions at a number of large pharmaceutical and small start-up companies, first in Quality Control and then in Quality Assurance, including Aventis Behring, Genetics Institute, Chiron, and InterMune. Dr. Cohrs has also contributed to numerous regulatory submissions resulting in several product approvals in both the United States and Europe. Dr. Cohrs received his Ph.D. in Organic Chemistry from Washington University and an M.B.A. in International Business from the University of Chicago.

John Ditton has served as our Vice President, Commercial Planning since April 2011. Prior to Ultragenyx, Mr. Ditton was the Chief Operating Officer at EveryLife Foundation for Rare Diseases, from January 2009 to April 2011. Prior to working at the EveryLife Foundation, Mr. Ditton served as the Vice President of Marketing at Diamics, Inc., a maker of cancer diagnostics, from October 2006 to December 2008 and Director of Global Marketing at BioMarin Pharmaceutical Inc., a biopharmaceutical company, from March 2004 to March 2006. Mr. Ditton holds an M.B.A. from the University of Tasmania.

Steven Jungles has served as our Senior Vice President, Technical Operations since August 2011. Prior to Ultragenyx, Mr. Jungles worked as Vice President, Supply Chain at BioMarin Pharmaceutical Inc., a biopharmaceutical company, from June 1999 to July 2011, was Associate Director of Operations at Harvard Gene Therapy Initiative from June 1997 until June 1999, and worked at Somatix Therapy Corporation, a research and development company in the field of gene therapy that was acquired by Cell Genesys, Inc., from March 1993 to May 1997. Mr. Jungles holds a B.S. in Biology from the University of Iowa.

Tony Koutsoukos, Ph.D. has served as our Vice President of Biometrics since October 2013. Prior to Ultragenyx, Mr. Koutsoukos worked as Vice President of Biometrics at Allos Therapeutics, a biopharmaceutical company, from September 2007 to March 2013, which was acquired by Spectrum Pharmaceuticals. He was also Director of Biostatistics at Amgen Inc., a biotechnology company, from May 2002 to September 2007. Prior to Amgen, Mr. Koutsoukos spent three years at Quintiles, a contract research company, as a Director of Biostatistics. His experience also includes five years at the FDA, Center for Drugs Evaluation and Research (CDER) division and approximately four years at the National Cancer Institute, Biometric Research Branch, CTEP, DCT. Dr. Koutsoukos received his Ph.D. and M.A., both in Mathematical Statistics from the University of Maryland, College Park.

Cordelia Leonard has served as our Vice President, Regulatory Affairs and Quality Assurance since July 2011. Prior to Ultragenyx, Ms. Leonard was Senior Director, Regulatory Affairs at BioMarin Pharmaceutical Inc., a biopharmaceutical company, from October 2003 until July 2011. Prior to BioMarin, Ms. Leonard was the Manager, Regulatory Affairs at Cerus Corporation, a biomedical products company, from May 1999 until October 2003. Ms. Leonard received bachelor degrees in Chemistry and Biological Science from the University of California, Irvine and holds both U.S. and EU Regulatory Affairs Certifications.

Javier San Martin, M.D. has served as our Vice President, Clinical Development since December 2013. Prior to Ultragenyx, Dr. San Martin served as Senior Vice President of Clinical Development at Alder Biopharmaceuticals Inc., a pharmaceutical company, from January 2012 through May 2013. Prior to Alder, Dr. San Martin served as Executive Director and Global Development Leader at Amgen, Inc., a biotechnology company, from March 2006 to September 2011. Prior to Amgen, Dr. San Martin served as Medical Advisor at Eli Lilly and Company, a pharmaceutical company, from June 1998 to February 2006. Dr. San Martin received his M.D. from the University of Buenos Aires Medical School and completed his residence in internal medicine at CEMIC University of Buenos Aires.

Vimal Srivastava has served as our Vice President, Program Development since August 2011. Before joining Ultragenyx, Mr. Srivastava was Senior Director, Portfolio and Project Management at Elan/Janssen Alzheimer Immunotherapy, a biotechnology company, from January 2008 until August 2011. He was also Director, Global Program Manager, Diabetes at Amgen Inc., a biotechnology company, from September 2005 to January 2008 and Director, Program Management at BioMarin Pharmaceutical Inc., a biopharmaceutical company, from March 2003 to September 2005. Mr. Srivastava holds a B.S. in Pharmacy from Banaras Hindu University, an M.S. in Medicinal Chemistry from St. John's University and an M.A.S. in Management from Johns Hopkins University.

Michael Vellard, Ph.D. has served as our Vice President, Research since May 2013. Prior to joining Ultragenyx, Dr. Vellard worked as Head of Lysosomal Biology at BioMarin Pharmaceutical Inc., a biopharmaceutical company, from October 1999 to May 2013. He was a postdoctoral fellow in the pediatric department at UCLA Harbor Medical Center from September 1992 to June 1995. Dr. Vellard received his B.S. in Natural and Life Sciences and M.S. in Molecular and Cellular Genetics from the University of Lyon I, France. He obtained his Ph.D. in Virology from the Pasteur and Curie Institutes (Universities Paris VI, VII and XI), France.

Spencer Guthrie has served as our Senior Director, Clinical Operations since June 2012. Prior to Ultragenyx, Mr. Guthrie worked as Director of Clinical Operations and Project Team Leader at Elan Pharmaceuticals, a biotechnology company, and Janssen Alzheimer's Immunotherapy from September 2007 to June 2012. Prior to that, Mr. Guthrie spent nine years with increasing responsibilities at Genentech in Clinical Operations and Market Planning. At Genentech, he worked on several innovative clinical programs, IND and BLA filings with Rituxan, Avastin, and Lucentis, including work on orphan indications. Mr. Guthrie also spent two years at ICON Clinical Research and a year at NASA's space science lab. Mr. Guthrie received his B.A. in Neuroscience from Vanderbilt University, an M.B.A. from the University of California, Irvine and he is certified as a Project Management Professional.

Alison Skrinar, Ph.D. has served as our Senior Director, Clinical Sciences since March 2012. Prior to joining Ultragenyx, Dr. Skrinar worked as the Senior Director of Clinical Outcomes and Regulatory Affairs from February 2009 to February 2012 at Enobia Pharma, Inc., a private clinical stage orphan company focused on the

development of an enzyme replacement therapy for hypophosphastasia, which was acquired by Alexion in 2012. Prior to Enobia Pharma, Dr. Skrinar was the Senior Director of Clinical Outcomes at Genzyme Corporation, a biotechnology company, from May 2001 until January 2009. In her nearly 15 years in the biotechnology industry, Dr. Skrinar has worked exclusively on the clinical development and regulatory approval of ultra-orphan drugs. Dr. Skrinar received a B.B.A. from Emory University and a Ph.D. and a Master of Public Health degree from the University of Alabama.

Board Composition

Director Independence

Our board of directors currently consists of five members and we anticipate that it will consist of six members upon the completion of this offering. Our board of directors has determined that all of our directors, other than Dr. Kakkis, and both of our director nominees, qualify as "independent" directors in accordance with the NASDAQ listing requirements. Dr. Kakkis is not considered independent because he is an employee of Ultragenyx. The NASDAQ independence definition includes a series of objective tests, such as that the director is not, and has not been for at least three years, one of our employees and that neither the director nor any of his family members has engaged in various types of business dealings with us. In addition, as required by NASDAQ rules, our board of directors has made a subjective determination as to each independent director and director nominee that no relationships exist, which, in the opinion of our board of directors, would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. In making these determinations, our board of directors reviewed and discussed information provided by the directors, director nominees, and us with regard to each director's and director nominee's business and personal activities and relationships as they may relate to us and our management. There are no family relationships among any of our directors or executive officers.

Classified Board of Directors

We currently have five directors, all of whom were elected pursuant to the terms of a voting agreement by and among us and certain of our stockholders, which will terminate upon completion of this offering. Upon the termination of the voting agreement, we will not be bound by contractual obligations regarding the election of our directors.

Effective upon the closing of this offering, we anticipate that we will have six directors and will divide the terms of office of the directors into three classes:

- Class I, whose term will expire at the annual meeting of stockholders to be held in 2014;
- Class II, whose term will expire at the annual meeting of stockholders to be held in 2015; and
- Class III, whose term will expire at the annual meeting of stockholders to be held in 2016.

Upon the completion of this offering, Class I shall consist of Emil D. Kakkis and Mårten Steen, Class II is expected to consist of Eran Nadav and Clay Siegall, and Class III is expected to consist of Matthew Fust and William Aliski. Benjamin Auspitz, currently a member of our board of directors, has indicated to us his intention to resign from our board of directors upon the completion of this offering. At each annual meeting of stockholders after the initial classification, the successors to directors whose terms will then expire shall serve from the time of election and qualification until the third annual meeting following election and until their successors are duly elected and qualified. A resolution of the board of directors may change the authorized number of directors. Any additional directorships resulting from an increase in the number of directors will be distributed among the three classes so that, as nearly as possible, each class will consist of one-third of the directors. This classification of the board of directors may have the effect of delaying or preventing changes in control or management of our company.

Following the completion of this offering, our nominating and corporate governance committee and board of directors may consider a broad range of factors relating to the qualifications and background of nominees, which may include diversity and is not limited to race, gender, or national origin. We have no formal policy regarding board diversity. Our nominating and corporate governance committee's and board of directors' priority in selecting

board members is identification of persons who will further the interests of our company through his or her established record of professional accomplishment, the ability to contribute positively to the collaborative culture among board members, and professional and personal experiences and expertise relevant to our growth strategy.

Board Committees

Effective upon the completion of this offering, our board of directors will have three standing committees: the audit committee, the compensation committee and the nominating and corporate governance committee.

Audit Committee

Effective upon the completion of this offering, our audit committee is expected to consist of Eran Nadav, Matthew Fust and Mårten Steen, with Matthew Fust 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 Exchange Act and the applicable listing standards of NASDAQ. Our board of directors has determined that Matthew Fust is an "audit committee financial expert" within the meaning of the SEC regulations and applicable listing standards of NASDAQ. 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;
- 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 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.

Compensation Committee

Effective upon the completion of this offering, our compensation committee is expected to consist of Eran Nadav, William Aliski, and Clay Siegall, with Eran Nadav 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 NASDAQ. The compensation committee's responsibilities upon completion of this offering will include:

- annually reviewing and approving 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 NASDAQ rules 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 NASDAQ;
- 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 discussing with management the compensation discussion and analysis, if any, to be included in our annual proxy statement or Annual Report on Form 10-K;
- preparing the compensation committee report required by the rules of the SEC 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 is expected to consist of Matthew Fust, Eran Nadav and Mårten Steen, with Matthew Fust 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 NASDAQ. 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 guidelines.

Our board of directors may establish other committees from time to time.

Leadership Structure and Risk Oversight

Our board of directors is currently chaired by Dr. Nadav. As a general policy, our board of directors believes that separation of the positions of chairman and chief executive officer reinforces the independence of the board of directors from management, creates an environment that encourages objective oversight of management's performance and enhances the effectiveness of the board of directors as a whole. As such, Dr. Kakkis serves as our president and chief executive officer while Dr. Nadav serves as our chairman of the board of directors but is not an officer.

Our board of directors oversees the management of risks inherent in the operation of our business and the implementation of our business strategies. Our board of directors performs this oversight role by using several different levels of review. In connection with its reviews of the operations and corporate functions of our company, our board of directors addresses the primary risks associated with those operations and corporate

functions. In addition, our board of directors reviews the risks associated with our company's business strategies periodically throughout the year as part of its consideration of undertaking any such business strategies.

Each of our board committees also oversees the management of our company's risk that falls within the committee's areas of responsibility. In performing this function, each committee has full access to management, as well as the ability to engage advisors. Our chief financial officer reports to the audit committee and is responsible for identifying, evaluating, and implementing risk management controls and methodologies to address any identified risks. In connection with its risk management role, our audit committee meets privately with representatives from our independent registered public accounting firm. The audit committee oversees the operation of our risk management program, including the identification of the primary risks associated with our business and periodic updates to such risks, and reports to our board of directors regarding these activities.

Compensation Committee Interlocks and Insider Participation

None of the members of our compensation committee has at any time during the prior three years been one of our officers or employees. None of our executive officers currently serves, or in the past fiscal year has served, as a member of the board of directors or compensation committee of any entity that has one or more executive officers serving on our board of directors or compensation committee. For a description of transactions between us and members of our compensation committee and affiliates of such members, please see "Certain Relationships and Related Party Transactions."

Board Diversity

Effective upon the completion of this offering, our nominating and corporate governance committee will be responsible for reviewing with the board of directors, on an annual basis, the appropriate characteristics, skills and experience required for the board of directors as a whole and its individual members. Although we do not have a formal policy regarding board diversity, in evaluating the suitability of individual candidates (both new candidates and current members), the nominating and corporate governance committee, in recommending candidates for election, and the board of directors, in approving (and, in the case of vacancies, appointing) such candidates, will take into account many factors, including the following:

- personal and professional integrity;
- ethics and values;
- experience in corporate management, such as serving as an officer or former officer of a publicly held company;
- experience in the industries in which we compete;
- experience as a board member or executive officer of another publicly held company;
- diversity of expertise and experience in substantive matters pertaining to our business relative to other board members;
- conflicts of interest; and
- practical and mature business judgment.

Currently, our board of directors evaluates, and, following the completion of this offering will evaluate, each individual in the context of the board of directors as a whole, with the objective of assembling a group that can best maximize the success of the business and represent stockholder interests through the exercise of sound judgment using its diversity of experience in these various areas.

Code of Business Conduct and Ethics

We have adopted 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. We intend to disclose any amendments to the code, or any waivers of its requirements, on our website.

EXECUTIVE AND DIRECTOR COMPENSATION

The following is a summary of the compensation arrangements of our named executive officers. Actual compensation programs that we may adopt may differ materially from currently planned programs as summarized in this discussion. As an "emerging growth company" as defined in the JOBS Act, we are not required to include a Compensation Discussion and Analysis section and have elected to comply with the scaled disclosure requirements applicable to emerging growth companies.

Summary Compensation Table

The following table sets forth the compensation earned during the years ended December 31, 2013 and 2012 to our chief executive officer and our next two highest-paid executive officers. We refer to these officers as our named executive officers.

Name and Principal Position	Year	Salary	Bonus	Option Awards[1]	Nonequity Incentive Plan Compensation[2]	All Other Compensation	Total
Emil D. Kakkis, M.D., Ph.D.	2013	$306,034	—	$218,873	—	$ 19,721	$544,628
President and Chief Executive Officer	2012	$300,172	—	—	$ 92,125	$ 9,056[3]	$401,353
Thomas Kassberg	2013	$289,419	—	$182,394	—	$ 20,352	$492,165
Chief Business Officer and Senior Vice President	2012	$272,041	—	—	$ 81,813	$ 15,640[4]	$369,494
Shalini Sharp[5]	2013	$278,440	$30,000	$182,394	—	$ 24,193	$515,027
Chief Financial Officer and Senior Vice President	2012	$148,669	—	$ 90,042	$ 51,560	$ 13,228[4]	$303,499

(1) The amounts reported in this column represent the grant date fair value of the stock options granted to our named executive officers during 2013 and 2012, respectively, as computed in accordance with Accounting Standards Codification, or ASC, Topic 718, not including any estimates of forfeitures. The assumptions used in calculating the grant date fair value of the stock options reported in this column are set forth in the notes to our financial statements included elsewhere in this prospectus. Note that the amounts reported in this column reflect the accounting cost for these stock options, and do not correspond to the actual economic value that may be received by the named executive officers from the options.

(2) Cash bonuses earned in fiscal 2013, which will be based on achievement of performance goals and other factors deemed relevant by our board of directors, have not yet been determined as of the date of this prospectus. Amounts for fiscal 2012 represent cash bonuses earned in 2012, and paid during 2013, based on achievement of performance goals and other factors deemed relevant by our board of directors.

(3) Amounts reported in this column consist of medical, dental, vision and life/accidental death & dismemberment and key person life insurance premiums paid by us.

(4) Amounts reported in this column consist of medical, dental, vision and life/accidental death & dismemberment premiums paid by us.

(5) Ms. Sharp commenced employment with us in May 2012.

Narrative Disclosure to Summary Compensation Table

Employment Arrangements with Our Named Executive Officers

Emil D. Kakkis, M.D., Ph.D., President and Chief Executive Officer. We entered into an executive employment agreement with Dr. Kakkis in June 2011 for the position of President and Chief Executive Officer.

Dr. Kakkis currently receives a base salary of $305,000, which is subject to adjustment at the discretion of the board of directors or the compensation committee. Dr. Kakkis is also eligible to participate in our employee benefit plans, subject to the terms of those plans. Pursuant to the terms of the executive employment agreement, the employment of Dr. Kakkis is at will; we may terminate his employment at any time, without advance notice, for any reason or for no reason at all and Dr. Kakkis may terminate his employment at any time, upon four weeks' prior written notice, for any reason or for no reason at all.

Thomas Kassberg, Chief Business Officer and Senior Vice President. We entered into an offer letter in October 2011 with Thomas Kassberg for the position of Chief Business Officer and Senior Vice President. Mr. Kassberg currently receives a base salary of $288,750, which is subject to adjustment at the discretion of the board of directors or the compensation committee. Mr. Kassberg is also eligible for an annual performance bonus of up to 30% of his base salary, payable based on his individual performance evaluated against certain goals mutually agreed upon and our overall performance, as determined by the Chief Executive Officer in consultation with the board of directors. Additionally, pursuant to the terms of the offer letter, Mr. Kassberg received an option to purchase 202,584 shares of our common stock in connection with his hiring. Mr. Kassberg is eligible to participate in our employee benefit plans, subject to the terms of those plans. Pursuant to the terms of the offer letter, Mr. Kassberg's employment is at will and may be terminated either by us or by him, with or without advance notice, for any reason or for no reason at all.

Shalini Sharp, Chief Financial Officer and Senior Vice President. We entered into an offer letter in March 2012 with Shalini Sharp for the position of Chief Financial Officer and Senior Vice President. Ms. Sharp currently receives a base salary of $278,299, which is subject to adjustment at the discretion of the board of directors or the compensation committee. Ms. Sharp is also eligible for an annual performance bonus of up to 30% of her base salary, payable based on her individual performance evaluated against certain goals mutually agreed upon and our overall performance, as determined by the Chief Executive Officer in consultation with the board of directors. Additionally, pursuant to the terms of the offer letter, Ms. Sharp received an option to purchase 191,418 shares of our common stock in connection with her hiring. Ms. Sharp is eligible to participate in our employee benefit plans, subject to the terms of those plans. Pursuant to the terms of the offer letter, Ms. Sharp's employment is at will and may be terminated either by us or by her, with or without advance notice, for any reason or for no reason at all.

Each of these employment arrangements also contain provisions that provide for certain payments and benefits in the event of an involuntary termination of employment. In addition, the named executive officers may be entitled to accelerated vesting of their outstanding and unvested awards in certain circumstances. The information below describes certain compensation that may become due and payable as a result of certain events.

Involuntary Termination of Employment

Pursuant to their employment arrangements, each named executive officer is eligible to receive certain payments and benefits in the event of certain qualifying terminations, including termination of his or her employment by us without "cause" (as defined below) or resignation of his or her employment with "good reason" or because of a "constructive termination" (each, as defined below). Upon the timely execution of a general release of claims, each named executive officer is eligible to receive the following payments and benefits:

- if Dr. Kakkis is terminated by us other than for cause or because of death or disability, he shall be entitled to receive six months of base salary continuation;
- if Dr. Kakkis resigns his employment with us for good reason following a "change in control" (as defined below) within six months of the event constituting good reason and after providing us with 20 days to cure the good reason, then he shall be entitled to receive 12 months of base salary continuation; and
- if Mr. Kassberg or Ms. Sharp is terminated by us without cause or resigns employment with us due to a constructive termination, each executive will be entitled to: (i) extend the exercise period applicable to

any options then held such that the executive has 12 months from termination to exercise any of the vested shares, provided that in no event shall the exercise period be extended beyond the expiration date of any options then held; and (ii) six months of base salary continuation.

Deemed Liquidation Event

Pursuant to the offer letter with Mr. Kassberg, in addition to the severance benefits described above, in the event (i) we consummate a "deemed liquidation event" (as defined in our certificate of incorporation), which includes certain mergers or material asset sales, as well as any dissolution, liquidation, or winding down of the Company, (ii) Mr. Kassberg is employed by us on the date of the deemed liquidation event, and (iii) Mr. Kassberg is terminated by us without cause or resigns his employment with us due to a constructive termination within 12 months after the deemed liquidation event, the vesting of Mr. Kassberg's November 17, 2011 option to purchase 202,584 shares of our common stock shall accelerate with respect to 50% of the then-unvested shares subject to such option and any other equity held by Mr. Kassberg shall accelerate with respect to 100% of the then-unvested shares.

Pursuant to the offer letter with Ms. Sharp, in the event (i) we consummate a deemed liquidation event, (ii) Ms. Sharp is employed by us on the date of the deemed liquidation event, and (iii) Ms. Sharp is terminated without cause or resigns due to a constructive termination within 12 months of the deemed liquidation event, the vesting of all options held by Ms. Sharp as of the date of the deemed liquidation event shall accelerate with respect to 50% of the then-unvested shares.

Definitions

For purposes of Dr. Kakkis's employment agreement, "cause" means his:

- commission of a felony or any crime involving dishonesty, breach of trust, or physical harm to any person;
- willful engagement in conduct that is in bad faith and materially injurious to us, including but not limited to misappropriation of trade secrets, fraud, or embezzlement;
- material breach of his employment agreement that is not cured within 10 days after written notice to him from us; or
- willful refusal to implement or follow a lawful policy or directive of ours, which breach is not cured within 10 days after written notice to him from us.

For purposes of each of the offer letters with Mr. Kassberg and Ms. Sharp, "cause" means the named executive officer's:

- gross negligence in carrying out, or material failure to carry out, his or her duties for us (including, without limitation, failure to cooperate in any company investigation), after notice from the board of directors and a reasonable opportunity to cure (if deemed curable);
- breach of his or her fiduciary duties to us, after notice from the board of directors and a reasonable opportunity to cure (if deemed curable);
- conviction of, or plea of guilty or no contest to, any felony;
- any act of fraud or embezzlement with respect to his or her obligations to us or otherwise relating to our business;
- material violation of any of our policies;
- material breach of any agreement entered into with us; or
- unauthorized use or disclosure of confidential information or trade secrets of ours or of our affiliates.

For purposes of Dr. Kakkis's employment agreement, "good reason" means any of the following events if (i) we effect the event without the consent of Dr. Kakkis and (ii) such event occurs after a change in control:

- a change in his position with us that materially reduces his level of responsibility;
- a material reduction in his base salary, except for reductions that are comparable to reductions generally applicable to similarly situated executives of ours; or
- a relocation of his principal place of employment by more than 50 miles.

For purposes of Dr. Kakkis's employment agreement, "change in control" means a change in ownership or control of us effected through a merger, consolidation, or acquisition by any person or related group of persons (other than an acquisition by us or by an employee benefit plan sponsored by us or by a person or persons that directly or indirectly control, is controlled by, or is under common control with, us) of beneficial ownership of securities possessing more than 50% of the total combined voting power of our outstanding securities.

For purposes of each of the offer letters with Mr. Kassberg and Ms. Sharp, "constructive termination" means the occurrence of any of the following events without the named executive officer's consent if (i) the executive provides us with written objection (or notice) to the event or condition within 30 days following the occurrence of the event or condition, (ii) we do not reverse or otherwise cure the event within 30 days of receiving such written objection, and (iii) the executive resigns his or her employment with us within 30 days following the expiration of that cure period:

- a material reduction or change in the executive's job duties, responsibilities and requirements from the executive's job duties, responsibilities and requirements immediately prior to such reduction or change, taking into account the differences in job title and duties that are normally occasioned by reason of an acquisition of one company by another;
- a material reduction of the executive's base salary (other than an equal, across-the-board reduction in the compensation of all similarly-situated employees of ours or the surviving entity that is approved by the board of directors); or
- a requirement that the executive relocate to a principal office that increases his or her one-way commute by more than 50 miles relative to the executive's immediately preceding principal office.

Terms and Conditions of Annual Bonuses

Our board of directors has adopted a corporate bonus plan, or the bonus plan, which is effective as of the completion of this offering. The bonus plan provides for cash bonus payments based upon the attainment of performance targets established by our compensation committee. The payment targets will be related to corporate, financial, and operational measures or objectives, or corporate performance goals, as well as individual performance objectives.

Our compensation committee may select corporate performance goals from among the following: sales; revenue; assets; expenses; earnings from operations, earnings before or after deduction for all or any portion of interest, taxes, depreciation, amortization, incentives, service fees or extraordinary or special items, whether or not on a continuing operations or an aggregate or per share basis; net income or net income per common share (basic or diluted); return on equity, investment, capital or assets; one or more operating ratios; borrowing levels, leverage ratios or credit rating; market share; capital expenditures; cash flow, free cash flow, cash flow return on investment, or net cash provided by operations; stock price, dividends or total stockholder return; development of new technologies or products; sales of particular products or services; economic value created or added; operating margin or profit margin; customer acquisition or retention; raising or refinancing of capital; successful hiring of key individuals; resolution of significant litigation; acquisitions and divestitures (in whole or in part); joint ventures and strategic alliances; spin-offs, split-ups and the like; reorganizations; recapitalizations, restructurings, financings (issuance of debt or equity) or refinancings; or strategic business criteria, consisting of one or more objectives based on the following goals: meeting specified market penetration or value added, product development or introduction (including, without limitation, any clinical trial accomplishments,

regulatory or other filings or approvals, or other product development milestones), geographic business expansion, cost targets, cost reductions or savings, customer satisfaction, operating efficiency, acquisition or retention, employee satisfaction, information technology, corporate development (including, without limitation, licenses, innovation, research or establishment of third party collaborations), manufacturing or process development, legal compliance or risk reduction, patent application or issuance goals, or goals relating to acquisitions or divestitures (in whole or in part), joint ventures or strategic alliances, any of which may be measured in absolute terms, as compared to any incremental increase, in terms of growth, as compared to results of a peer group, against the market as a whole, compared to applicable market indices and/or measured on a pre-tax or post-tax basis.

Each executive officer who is selected to participate in the bonus plan will have a target bonus opportunity set for each performance period. The bonus formulas will be adopted in each performance period by the compensation committee and communicated to each executive. The corporate performance goals will be measured at the end of each performance period after our financial reports have been published or such other appropriate time as the compensation committee determines. If the corporate performance goals and individual performance objectives are met, payments will be made following the end of each performance period. Subject to the rights contained in any agreement between the executive officer and the company, an executive officer must be employed by the company on the bonus payment date to be eligible to receive a bonus payment. The bonus plan also permits the compensation committee to approve additional bonuses in its sole discretion.

Equity Compensation

Outstanding Equity Awards at December 31, 2013

The following table sets forth information concerning the outstanding equity awards held by each of the named executive officers as of December 31, 2013.

	Option awards			
Name	Number of securities underlying unexercised options (#) exercisable	Number of securities underlying unexercised options (#) unexercisable	Option exercise price ($)	Option expiration date
Emil D. Kakkis, M.D., Ph.D[1].	—	47,854	$ 6.86	10/31/2023
Thomas Kassberg[2]	12,661	97,071	0.31	11/16/2021
	—	39,878	$ 6.86	10/31/2023
Shalini Sharp[3]	11,963	115,648	0.81	8/1/2022
	—	39,878	$ 6.86	10/31/2023

(1) Represents an option to purchase 47,854 shares of our common stock granted on November 1, 2013. The shares underlying this option vest as follows: 25% vest on November 1, 2014, with the remainder of the shares vesting in equal monthly installments over the following three years through November 1, 2017, subject to the holder's continued service to us through each such vesting date.

(2) Represents an option to purchase 202,584 shares of our common stock granted on November 17, 2011. The shares underlying this option vest as follows: 25% vest on November 15, 2012, with the remainder of the shares vesting in equal monthly installments over the following three years through November 15, 2015, subject to the holder's continued service to us through each such vesting date. Vesting of 50% of the unvested shares shall accelerate in connection with a deemed liquidation event pursuant to the terms of Mr. Kassberg's offer letter dated October 31, 2011, as more fully described above under the section entitled "—Narrative Disclosure to Summary Compensation Table—Deemed Liquidation Event." Mr. Kassberg exercised 50,646 options on November 28, 2012 and 42,204 options on September 27, 2013.

Represents an option to purchase 39,878 shares of our common stock granted on November 1, 2013. The shares underlying this option vest as follows: 25% vest on November 1, 2014, with the remainder of the

shares vesting in equal monthly installments over the following three years through November 1, 2017, subject to the holder's continued service to us through each such vesting date.

(3) Represents an option to purchase 191,418 shares of our common stock granted on August 2, 2012. The shares underlying this option vest as follows: 25% vest on May 21, 2013, with the remainder of the shares vesting in equal monthly installments over the following three years through May 21, 2016, subject to the holder's continued service to us through each such vesting date. Vesting of 50% of the unvested shares shall accelerate in connection with a deemed liquidation event pursuant to the terms of Ms. Sharp's offer letter dated March 12, 2012, as more fully described above under the section entitled "—Narrative Disclosure to Summary Compensation Table—Deemed Liquidation Event." Ms. Sharp exercised 47,854 options on May 30, 2013, 7,975 options on July 24, 2013, and 7,975 options on September 26, 2013.

Represents an option to purchase 39,878 shares of our common stock granted on November 1, 2013. The shares underlying this option vest as follows: 25% vest on November 1, 2014, with the remainder of the shares vesting in equal monthly installments over the following three years through November 1, 2017, subject to the holder's continued service to us through each such vesting date.

Director Compensation

Dr. Kakkis, our president and chief executive officer, receives no compensation for his service as a director. None of our non-employee directors received compensation for their service on the board or otherwise during fiscal 2012.

Our board of directors has adopted a non-employee director compensation policy, effective as of the closing 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 non-employee directors. Under the policy, all non-employee directors will be paid cash compensation from and after the completion of this offering, as set forth below:

	Annual Retainer
Board of Directors:	
All non-employee members	$35,000
Audit Committee:	
Chairman	$15,000
Non-Chairman members	$ 7,500
Compensation Committee:	
Chairman	$10,000
Non-Chairman members	$ 5,000
Nominating and Corporate Governance Committee:	
Chairman	$ 6,000
Non-Chairman members	$ 3,000

Under the non-employee director compensation policy, each non-employee director serving on our board of directors upon the completion of this offering and each non-employee director who is initially appointed or elected to the board of directors after the completion of this offering will receive for an option grant to purchase up to 17,500 shares of our common stock under our stock option plan on the date he or she first becomes a non-employee director, which will vest annually over a three-year period, subject to the holder's continued service to us through each such vesting date. In addition, on the date of the annual meeting of stockholders, each continuing non-employee director will be eligible to receive an annual option grant to purchase up to 7,500 shares of our common stock, which will vest in full upon the first anniversary of the date of grant, subject to the holder's continued service to us through such vesting date. All of the foregoing options will be granted at fair market value on the date of grant.

Compensation Risk Assessment

We believe that 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 us.

Equity Compensation Plans and Other Benefit Plans

2014 Incentive Plan

Prior to the completion of this offering, our board of directors intends to adopt the Ultragenyx Pharmaceutical Inc. 2014 Incentive Plan, or the 2014 Plan, and, following this offering, all equity-based awards will be granted under the 2014 Plan. As of the date of this prospectus, no awards have been made under the 2014 Plan. The following summary describes what we anticipate to be the material terms of the 2014 Plan. This summary of the 2014 Plan is not a complete description of all provisions of the 2014 Plan and is qualified in its entirety by reference to the 2014 Plan, which is filed as an exhibit to the registration statement of which this prospectus is a part.

Purpose. The purpose of the 2014 Plan is to advance the company's interests by providing for the grant to participants of equity and other incentive awards.

Plan Administration. The 2014 Plan is administered by our compensation committee. Our compensation committee has the authority to, among other things, interpret the 2014 Plan, determine eligibility for, grant and determine the terms of awards under the 2014 Plan, and to do all things necessary to carry out the purposes of the 2014 Plan. Our compensation committee's determinations under the 2014 Plan are conclusive and binding.

Authorized Shares. Subject to adjustment, the maximum number of shares of our common stock that may be delivered in satisfaction of awards under the 2014 Plan is 2,250,000, which includes the shares of our common stock that are available for grant under the 2011 Plan (defined and described below) on the date the 2014 Plan is adopted, and any shares that become available under the 2011 Plan as a result of the termination, cancellation or forfeiture of awards under the 2011 Plan. The number of shares of our common stock available for issuance under the 2014 Plan will be automatically increased on January 1 of each year, beginning January 1, 2015 through January 1, 2024, by an amount equal to the least of (i) 2,500,000 shares of common stock, (ii) 4% of the number of shares of common stock outstanding on a fully diluted basis as of the close of business on the immediately preceding day (calculated by adding to the number of shares of common stock outstanding, all outstanding securities convertible into common stock on such date on an as converted basis), and (iii) a lesser amount determined by the compensation committee on or prior to January 1 of a given year.

Shares of our common stock to be issued under the 2014 Plan may be authorized but unissued shares of our common stock or previously issued shares acquired by us. Any shares of our common stock underlying awards that are settled in cash or otherwise expire, terminate, or are forfeited prior to the issuance of stock will again be available for issuance under the 2014 Plan.

Individual Limits. The maximum number of shares of our common stock subject to stock options and the maximum number of shares of our common stock subject to stock appreciation rights that may be granted to any person in any calendar year is each 1,000,000 shares. The maximum number of shares of our common stock subject to other awards that may be granted to any person in any calendar year is 1,000,000 shares. The maximum amount payable to any person in any twelve-month period under cash awards will be $430,000. Any awards granted in excess of the foregoing limits will not be eligible to be excluded from the applicable Section 162(m) limits and such excess amount may not be deductible by the Company as performance-based compensation.

Eligibility. Our compensation committee will select participants from among our key employees, directors, consultants and advisors and of our affiliates who are in a position to contribute significantly to the success of the company and its affiliates. Eligibility for options intended to be incentive stock options, or ISOs, is limited to employees of the company or certain affiliates.

Types of Awards. The 2014 Plan provides for grants of stock options, stock appreciation rights, restricted and unrestricted stock and stock units, performance awards, cash awards and other awards convertible into or otherwise based on shares of our common stock. Dividend equivalents may also be provided in connection with an award under the 2014 Plan.

- Stock options. A stock option is an award that entitles the participant to receive stock upon payment of the exercise price. The exercise price of an option may not be less than the fair market value (or, in the case of an ISO granted to a ten percent shareholder, 110% of the fair market value) of a share of our common stock on the date of grant. Our compensation committee will determine the time or times at which stock options become exercisable and the terms on which they remain exercisable.
- Stock appreciation rights. A stock appreciation right is an award that entitles the participant to receive stock or cash upon exercise equal to the excess of the value of the shares subject to the right over the base price. The base price of a stock appreciation right may not be less than the fair market value of a share of our common stock on the date of grant. Our compensation committee will determine the time or times at which stock appreciation rights become exercisable and the terms on which they remain exercisable.
- Restricted and unrestricted stock. A restricted stock award is an award of common stock subject to forfeiture restrictions, while an unrestricted stock award is not subject to restrictions.
- Stock units. A stock unit award is denominated in shares of our common stock and entitles the participant to receive stock or cash measured by the value of the shares in the future. The delivery of stock or cash under a stock unit may be subject to the satisfaction of performance conditions or other vesting conditions.
- Performance awards. A performance award is an award the vesting, settlement or exercisability of which is subject to specified performance criteria.
- Cash awards: An award that is settled in cash.

Vesting. Our compensation committee has the authority to determine the vesting schedule applicable to each award, and to accelerate the vesting or exercisability of any award.

Termination of Employment. Our compensation committee will determine the effect of termination of employment or service on an award. Unless otherwise provided by our compensation committee or in an award agreement, upon a termination of a participant's employment all unvested options then held by the participant and other awards requiring exercise will terminate and all other unvested awards will be forfeited. Unless otherwise provided for by our compensation committee, all vested stock options and stock appreciation rights then held by the participant will remain outstanding for three months, or one year in the case of death, or, in each case, until the applicable expiration date, if earlier. All stock options and stock appreciation rights held by a participant immediately prior to the participant's termination of employment will immediately terminate upon termination of employment if the termination is for cause as defined in the 2014 Plan or occurs in circumstances that would have constituted grounds for the participant's employment to be terminated for cause, in the determination of the Administrator.

Performance Criteria. The 2014 Plan provides for the grant of performance awards that are made based upon, and subject to achieving, "performance objectives." Performance objectives with respect to those awards that are intended to qualify as "performance-based compensation" for purposes of Section 162(m) of the Code, or Section 162(m) are limited to an objectively determinable measure or measures of performance relating to any or any combination of the following (measured either absolutely or by reference to an index or indices and determined either on a consolidated basis or, as the context permits, on a divisional, subsidiary, line of business, project or geographical basis or in combinations thereof): sales; revenue; assets; expenses; earnings from operations, earnings before or after deduction for all or any portion of interest, taxes, depreciation, amortization, incentives, service fees or extraordinary or special items, whether or not on a continuing operations or an aggregate or per share basis; net income or net income per common share (basic or diluted); return on equity, investment, capital or assets; one or more operating ratios; borrowing levels, leverage ratios or credit rating; market share; capital expenditures; cash flow, free cash flow, cash flow return on investment, or net cash

provided by operations; stock price, dividends or total stockholder return; development of new technologies or products; sales of particular products or services; economic value created or added; operating margin or profit margin; customer acquisition or retention; raising or refinancing of capital; successful hiring of key individuals; resolution of significant litigation; acquisitions and divestitures (in whole or in part); joint ventures and strategic alliances; spin-offs, split-ups and the like; reorganizations; recapitalizations, restructurings, financings (issuance of debt or equity) or refinancings; or strategic business criteria, consisting of one or more objectives based on the following goals: meeting specified market penetration or value added, product development or introduction (including, without limitation, any clinical trial accomplishments, regulatory or other filings or approvals, or other product development milestones), geographic business expansion, cost targets, cost reductions or savings, customer satisfaction, operating efficiency, acquisition or retention, employee satisfaction, information technology, corporate development (including, without limitation, licenses, innovation, research or establishment of third party collaborations), manufacturing or process development, legal compliance or risk reduction, patent application or issuance goals, or goals relating to acquisitions or divestitures (in whole or in part), joint ventures or strategic alliances.

To the extent consistent with the requirements for satisfying the performance-based compensation exception under Section 162(m), our compensation committee may provide in the case of any award intended to qualify for such exception that one or more of the performance objectives applicable to an award will be adjusted in an objectively determinable manner to reflect events (for example, acquisitions or dispositions) occurring during the performance period of such award that affect the applicable performance objectives.

Transferability. Awards under the 2014 Plan may not be transferred except by will or by the laws of descent and distribution, unless (for awards other than ISOs) otherwise provided by our compensation committee.

Recovery of Compensation; Other Terms. Awards granted under the 2014 Plan are subject to forfeiture, termination and rescission, and a participant will be obligated to return to the company the value received with respect to awards, to the extent provided by our compensation committee in an award agreement, pursuant to Company policy relating to the recovery of erroneously-paid incentive compensation, or as otherwise required by law or applicable stock exchange listing standards.

Covered Transactions. In the event of a consolidation, merger or similar transaction, a sale or transfer of all or substantially all of our assets or our dissolution or liquidation, our compensation committee may, among other things, provide for continuation or assumption of outstanding awards, for new grants in substitution of outstanding awards, for the accelerated vesting or delivery of shares under awards or for a cash-out of outstanding awards, in each case on such terms and with such restrictions as it deems appropriate. Except as our compensation committee may otherwise determine, awards not assumed or continued will automatically terminate and in the case of outstanding shares of restricted stock, will automatically be forfeited upon the consummation of such covered transaction.

Adjustment. In the event of a stock dividend, stock split or combination of shares including a reverse stock split, recapitalization or other change in our capital structure that constitutes an equity restructuring within the meaning of the Financial Accounting Standards Board, Accounting Standards Codification Topic 718, *Compensation — Stock Compensation*, our compensation committee will make appropriate adjustments to the maximum number of shares that may be delivered under, and the individual share limits included in, the 2014 Plan, and will also make appropriate adjustments to the number and kind of shares of stock or securities subject to awards, the exercise prices of such awards or any other terms of awards affected by such change. Our compensation committee will also make the types of adjustments described above to take into account distributions and other events other than those listed above if it determines that such adjustments are appropriate to avoid distortion and preserve the value of awards.

Amendment and Termination. Our compensation committee will be able to amend the 2014 Plan or outstanding awards, or terminate the 2014 Plan as to future grants of awards, except that our compensation committee will not be able to alter the terms of an award if it would affect materially and adversely a participant's rights under the award without the participant's consent (unless expressly provided in the 2014 Plan or the right to alter the terms of an award was expressly reserved by our compensation committee at the time the

award was granted). Stockholder approval will be required for any amendment to the 2014 Plan to the extent such approval is required by law, including the Code or applicable stock exchange requirements.

Employee Stock Purchase Plan

Prior to the completion of this offering, our board of directors intends to adopt the Ultragenyx Pharmaceutical Inc. 2014 Employee Stock Purchase Plan, or the 2014 ESPP, as a means of permitting our eligible employees, including our named executive officers, to acquire shares of our common stock. 600,000 shares of our common stock will be available for issuance under the 2014 ESPP. The number of shares of our common stock available for issuance under the 2014 ESPP will be automatically increased on January 1 of each year, beginning January 1, 2015 through January 1, 2024, by an amount equal to the least of (i) 1,200,000 shares of common stock, (ii) 1% of the number of shares of common stock outstanding on a fully diluted basis as of the close of business on the immediately preceding day (calculated by adding to the number of shares of common stock outstanding, all outstanding securities convertible into common stock on such date on an as converted basis), and (iii) a lesser amount determined by the compensation committee on or prior to January 1 of a given year. Under the 2014 ESPP, eligible employees of the company may purchase shares of our common stock during pre-specified purchase periods at a price equal to the lesser of 85% of the fair market value of a share of our common stock at the beginning of the purchase period or 85% of the fair market value of a share of our common stock at the end of the purchase period. As of the date of this prospectus, our board of directors has not determined the date on which the initial purchase period will commence under the 2014 ESPP, however the initial purchase period will not commence prior to the completion of this offering.

2011 Equity Incentive Plan, as amended

The Ultragenyx Pharmaceutical Inc. 2011 Equity Incentive Plan, which became effective June 14, 2011 and was amended on December 18, 2012 (as so amended, the "2011 Plan"), provides for the grant of equity-based awards to participants selected by our board of directors. The following summary of the 2011 Plan is not a complete description of all provisions of the 2011 Plan and is qualified in its entirety by reference to the 2011 Plan, which is filed as an exhibit to the registration statement of which this prospectus is a part. Following this offering, all equity-based awards will be granted under the company's 2014 Plan described above.

Purpose. The purpose of the 2011 Plan is to promote the success and enhance the value of the company by linking the personal interests of the members of the board of directors, employees and consultants of the company and our affiliates to those of the company stockholders and by providing such individuals with an incentive for performance to generate returns to stockholders. The 2011 Plan is also intended to provide the company flexibility in our ability to motivate, attract, and retain the services of such individuals.

Plan Administration. The 2011 Plan is administered by our board of directors, which has authority to determine eligibility for and grant awards and to determine the terms and conditions of all awards, including the time or times upon which awards vest or become exercisable and remain exercisable, and make all other decisions and determinations necessary or advisable to administer the 2011 Plan. The 2011 Plan administrator's determinations under the 2011 Plan are conclusive and binding.

Authorized Shares. Subject to adjustment, the aggregate number of shares of our common stock that may be delivered in satisfaction of awards under the 2011 Plan is 3,756,521 shares. As of September 30, 2013, options to purchase a total of 1,526,772 shares of common stock were issued and outstanding under the 2011 Plan, a total of 664,396 shares of common stock had been issued upon the exercise of options granted under the 2011 Plan and 1,565,352 shares remained available for future grants under the 2011 Plan. Shares of our common stock to be issued under the 2011 Plan may be authorized but unissued shares of our common stock, our treasury stock or, after the completion of this offering, our common stock purchased on the open market. The payment of dividend equivalents in cash will not be counted against the shares available for issuance under the 2011 Plan. Any shares of our common stock underlying awards that expire, terminate, are forfeited or repurchased by us prior to the issuance of stock, or that are withheld in payment of the exercise price of an award or in satisfaction of tax withholding will again be available for issuance under the 2011 Plan.

Eligibility. The 2011 Plan Administrator selects participants from among our key employees, directors, and consultants and of our affiliates. Eligibility for options intended to be incentive stock options, or ISOs, is limited to employees of the company or certain affiliates.

Types of Awards. The 2011 Plan provides for grants of stock options, restricted stock and stock units, stock appreciation rights and stock payments. Dividend equivalents may also be provided in connection with an award under the 2011 Plan. Under the 2011 Plan only stock options have been granted.

- Stock options. A stock option is an award that entitles the participant to receive stock upon payment of the exercise price. The exercise price of an option may not be less than the fair market value (or, in the case of an ISO granted to a ten percent shareholder, 110% of the fair market value) of a share of our common stock on the date of grant. The 2011 Plan administrator determines the time or times at which stock options become exercisable and the terms on which they remain exercisable. The 2011 Plan administrator may permit a participant to exercise an option prior to the full vesting of the award, provided that the shares acquired upon exercise of such option may be subject to forfeiture, transfer or other restrictions imposed by the 2011 Plan administrator.
- Restricted stock. A restricted stock award is an award of common stock subject to repurchase, forfeiture and transferability restrictions imposed by the 2011 Plan administrator. Unless the 2011 Plan administrator determines otherwise, upon the termination of a participant's service for any reason, restricted stock shall be forfeited or subject to repurchase by the company.

Transferability. Awards under the 2011 Plan may not be transferred except by will or by the laws of descent and distribution, unless (for awards other than ISOs) the 2011 Plan administrator permits awards to be transferred to, exercised by and paid to a permitted transferee as defined in the 2011 Plan, subject to certain terms and conditions as described in detail in the 2011 Plan.

Corporate Transactions. In the event of any combination or exchange of shares, merger, consolidation, distribution of assets to stockholders (other than normal cash dividends) or similar corporate transaction affecting out stock or the share price of our stock, the 2011 Plan administrator will make proportionate adjustments to the aggregate number and type of shares issuable under the 2011 Plan, the terms and conditions of outstanding, and the grant or exercise price per share of any outstanding awards. In addition, the 2011 Plan administrator may provide for the cash out of existing awards, the assumption or substitution of outstanding awards, an adjustment to the terms and conditions of outstanding awards including the number and type of shares subject to such awards, the acceleration of vesting conditions or the cancellation of outstanding awards.

Change in Control. Unless an award agreement provides otherwise, in the event of a change in control (as defined in the 2011 Plan) if awards are not continued, assumed, or replaced, each award will become fully exercisable and/or payable, as applicable, and all restrictions shall lapse immediately prior to such change in control. Any awards that are continued, assumed, or replaced in connection with the change of control shall become fully exercisable and/or payable, as applicable, and all restrictions shall lapse in the event the participant is terminated in connection with or within 12 months following the change in control, unless such termination is with cause or without good reason, each as defined in the 2011 Plan.

Adjustment. In the event of a stock dividend, stock split, spin-off, rights offering or recapitalization that affects the shares of stock or the share price of stock, the 2011 Plan administrator will make proportionate, nondiscretionary adjustments to the maximum number of shares that may be issued under the 2011 Plan, the number of shares of stock or securities subject to awards, the exercise prices of such awards or any other terms of awards affected by such change.

Amendment and Termination. Our Board may terminate, amend or modify the 2011 Plan; stockholder approval will be required for any amendment to the 2011 Plan to the extent necessary to comply with any applicable law, regulation or stock exchange rule. The 2011 Plan administrator has the authority to cancel any or all outstanding wards under the 2011 Plan with the consent of the affected award holders, and to grant substitute awards. No termination, amendment or modification of the 2011 Plan may adversely affect in any material way any outstanding awards without the prior written consent of the participant. Unless terminated sooner by the 2011

Plan administrator or extended with stockholder approval, the 2011 Plan will terminate on June 14, 2021. No awards may be granted under our 2011 Plan after it is terminated.

401(k) Plan

We maintain a 401(k) plan for employees. The 401(k) plan is intended to qualify under Section 401(k) of the Code, so that contributions to the 401(k) plan by employees or by us, and the investment earnings thereon, are not taxable to the employees until withdrawn from the 401(k) plan, and so that contributions by us, if any, will be deductible by us when made. Under the 401(k) plan, employees may elect to reduce their current compensation by up to the statutorily prescribed annual limit and to have the amount of such reduction contributed to the 401(k) plan. The 401(k) plan permits us to make contributions up to the limits allowed by law on behalf of all eligible employees. Historically, we have not made any matching contributions to the 401(k) plan.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

The following is a description of transactions since January 1, 2010 to which we have been a party, in which the amount involved exceeds $120,000, and in which any of our directors, executive officers or holders of more than 5% of our capital stock, or an affiliate or immediate family member thereof, had or will have a direct or indirect material interest. We believe the terms obtained or consideration that we paid or received, as applicable, in connection with the transactions described below were comparable to terms available or the amounts that would be paid or received, as applicable, from unaffiliated third parties.

Sales and Purchases of Securities

Series A Convertible Preferred Stock Financing

On June 16, 2011, we sold an aggregate of 18,052,464 shares of our Series A convertible preferred stock to eight investors at a purchase price of $1.034 per share, for an aggregate purchase price of approximately $15.0 million in cash and $3.7 million in converted bridge notes. On July 16, 2012, we sold, pursuant to a second tranche closing, an aggregate of 14,604,895 shares of our Series A convertible preferred stock to six investors at a purchase price of $1.034 per share, for an aggregate purchase price of $15.1 million in cash. The table below sets forth the aggregate number of shares of Series A convertible preferred stock sold to our directors, executive officers or holders of more than 5% of our capital stock, or an immediate family member thereof, as applicable:

Name of Stockholder	Number of Shares of Series A Convertible Preferred Stock	Total Purchase Price
Emil D. Kakkis, M.D., Ph.D.	1,814,944	$ 1,876,471
William Aliski	247,049	$ 255,424

Convertible Notes and Series A Convertible Preferred Stock Warrants

On June 30, 2010, we entered into a Note and Warrant Purchase Agreement with Emil D. Kakkis, M.D., Ph.D. Pursuant to the Note and Warrant Purchase Agreement, we issued a convertible promissory note in the amount of $1.0 million to Dr. Kakkis and also issued him a warrant to purchase up to 241,803 shares of our Series A convertible preferred stock. Emil D. Kakkis, M.D., Ph.D. is our President and Chief Executive Officer and one of our directors.

On February 23, 2011, we entered into a Note and Warrant Purchase Agreement with William Aliski. Pursuant to the Note and Warrant Purchase Agreement, we issued a convertible promissory note in the amount of $250,000 to Mr. Aliski and also issued him a warrant to purchase up to 84,631 shares of our Series A convertible preferred stock. William Aliski is one of our directors.

On June 14, 2011, we entered into a Note and Warrant Purchase Agreement with Emil D. Kakkis, M.D., Ph.D. Pursuant to the Note and Warrant Purchase Agreement, we issued a convertible promissory note in the amount of $300,000 to Dr. Kakkis and also issued him a warrant to purchase up to 72,541 shares of our Series A convertible preferred stock.

On June 14, 2011, we entered into a second Note and Warrant Purchase Agreement with Emil D. Kakkis, M.D., Ph.D. Pursuant to the Note and Warrant Purchase Agreement, we issued a convertible promissory note in the amount of $500,000 to Dr. Kakkis and also issued him a warrant to purchase up to 120,901 shares of our Series A convertible preferred stock.

Series B Convertible Preferred Stock Financing

On December 18, 2012, we sold an aggregate of 27,081,680 shares of our Series B convertible preferred stock to 34 investors at a purchase price of $2.769 per share, for an aggregate purchase price of approximately $75 million in cash. The table below sets forth the aggregate number of shares of Series B convertible preferred stock sold to our directors, executive officers or holders of more than 5% of our capital stock, or an immediate family member thereof, as applicable:

Name of Stockholder	Number of Shares of Series B Convertible Preferred Stock	Total Purchase Price
TPG Biotechnology Partners III, L.P.	541,634	$ 1,500,001
Beacon Bioventures Fund II Limited Partnership	541,634	$ 1,500,001
HealthCap VI L.P.	481,452	$ 1,333,333
Entities affiliated with A.M. Pappas Life Science Ventures IV, L.P.	240,727	$ 666,669

Indemnification Agreements and Directors' and Officers' Liability Insurance

We intend to enter into indemnification agreements with each of our executive officers and directors prior to the completion of this offering. We also maintain an insurance policy that 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.

Registration Rights Agreement

We and certain holders of our preferred stock have entered into an investor rights agreement pursuant to which these stockholders will have, among other things, registration rights under the Securities Act of 1933, as amended, with respect to common stock that they will hold following this offering. Upon the completion of this offering, all outstanding shares of our preferred stock will be converted into common stock. See "Description of Capital Stock — Registration Rights" for a further description of the terms of these agreements.

Procedures for Related Party Transactions

We have adopted a related person transaction approval policy that will govern the review, approval and/or ratification of related person transactions following the closing of this offering. Pursuant to this policy, if we want to enter into a transaction with a related person or an affiliate or immediate family member of a related person, our chief financial officer will review the proposed transaction to determine, based on applicable NASDAQ and SEC rules, if such transaction qualifies as a related person transaction. If the chief financial officer determines that the proposed transaction is a related person transaction, then the proposed transaction shall be submitted to the audit committee for pre-approval at the next regular or special audit committee meeting; if the chief financial officer, in consultation with the chief executive officer, determines that it is not practicable to wait until the next meeting of the audit committee, then the chief financial officer shall submit the proposed transaction to the chairperson of the audit committee. In the event that our chief executive officer or chief financial officer becomes aware of a related person transaction that has not been previously approved or previously ratified under our related person transaction approval policy, the transaction, if pending or ongoing, will be promptly submitted to the audit committee or the chairperson of the audit committee for consideration. If the transaction is already completed, the audit committee or the chairperson of the audit committee shall evaluate the transaction to determine if rescission of the transaction and/or any disciplinary action is appropriate.

PRINCIPAL STOCKHOLDERS

The following table sets forth information relating to the beneficial ownership of our common stock as of January 10, 2014, by:

- each person, or group of affiliated persons, known by us to beneficially own more than 5% of our outstanding shares of common stock;
- each of our directors and our nominee for director;
- each of our named executive officers; and
- all directors and executive officers as a group.

The number of shares beneficially owned by each entity, person, director or executive officer is determined in accordance with the rules of the SEC, and the information is not necessarily indicative of beneficial ownership for any other purpose. Under such rules, beneficial ownership includes any shares over which the individual has sole or shared voting power or investment power as well as any shares that the individual has the right to acquire within 60 days of January 10, 2014 through the exercise of any stock option, warrants or other rights. Except as otherwise indicated, and subject to applicable community property laws, the persons named in the table have sole voting and investment power with respect to all shares of common stock held by that person.

The percentage of shares beneficially owned is computed on the basis of 23,383,381 shares of our common stock outstanding as of January 10, 2014, which reflects the assumed conversion of all of our outstanding shares of preferred stock into an aggregate of 19,598,486 shares of common stock. Shares of our common stock that a person has the right to acquire within 60 days of January 10, 2014 are deemed outstanding for purposes of computing the percentage ownership of the person holding such rights, but are not deemed outstanding for purposes of computing the percentage ownership of any other person, except with respect to the percentage ownership of all directors and executive officers as a group. Unless otherwise indicated below, the address for each beneficial owner listed is c/o Ultragenyx Pharmaceutical Inc., at 60 Leveroni Court, Novato, California 94949.

Name and Address of Beneficial Owner	Number of Shares Beneficially Owned	Percentage of Shares Beneficially Owned	
		Before Offering	After Offering
5% or Greater Stockholders:			
TPG Biotechnology Partners III, L.P.[1]	3,085,240	13.2%	10.9%
Beacon Bioventures Fund II Limited Partnership[2]	3,085,240	13.2%	10.9%
HealthCap VI, L.P.[3]	2,742,436	11.7%	9.7%
Adage Capital Partners, L.P.[4]	1,727,974	7.4%	6.1%
Funds managed by Capital Research Global Investors[5]	1,497,576	6.4%	5.3%
Entities affiliated with A.M. Pappas Life Science Ventures IV, L.P.[6]	1,371,213	5.9%	4.9%
Directors (including our Director Nominees) and Named Executive Officers:			
Eran Nadav, Ph.D.	—	—	—
Benjamin Auspitz	—	—	—
Mårten Steen, M.D., Ph.D.	—	—	—
William Aliski[7]	58,902	*	*
Matthew Fust[8]	—	—	—
Clay B. Siegall, Ph.D.[8]	—	—	—
Emil D. Kakkis, M.D., Ph.D.[9]	3,315,336	14.1%	11.7%
Thomas Kassberg[10]	145,406	*	*
Shalini Sharp[11]	83,743	*	*
All executive officers and directors as a group[12] (7 persons)	3,603,387	15.3%	12.7%

* Indicates beneficial ownership of less than 1% of the total outstanding common stock.

(1) Consists of (a) 2,912,443 shares of common stock issuable upon conversion of shares of Series A convertible preferred stock and (b) 172,797 shares of common stock issuable upon conversion of shares of

Series B convertible preferred stock. TPG Biotechnology Partners III, L.P. is a Delaware limited partnership, whose general partner is TPG Biotechnology GenPar III, L.P., a Delaware limited partnership, whose general partner is TPG Biotechnology GenPar III Advisors, LLC, a Delaware limited liability company, whose sole member is TPG Holdings I, L.P., a Delaware limited partnership, whose general partner is TPG Holdings I-A, LLC, a Delaware limited liability company, whose sole member is TPG Group Holdings (SBS), L.P., a Delaware limited partnership, whose general partner is TPG Group Holdings (SBS) Advisors, Inc., or Group Advisors, a Delaware corporation. Messrs. David Bonderman and James G. Coulter are officers, directors and sole shareholders of Group Advisors and may therefore be deemed to be the beneficial owners of the shares held by TPG Biotechnology Partners III, L.P. The address for Messrs. Bonderman and Coulter is c/o TPG Capital, L.P., 301 Commerce Street, Suite 3300, Fort Worth, TX 76102.

(2) Consists of (a) 2,912,443 shares of common stock issuable upon conversion of shares of Series A convertible preferred stock and (b) 172,797 shares of common stock issuable upon conversion of shares of Series B convertible preferred stock. Beacon Bioventures Advisors Fund II Limited Partnership is the general partner of Beacon Bioventures Fund II Limited Partnership. Beacon Bioventures Advisors Fund II Limited Partnership is solely managed by Northern Neck Investors LLC, its general partner and investment manager. Northern Neck Investors LLC is owned by the shareholders and certain employees of FMR LLC. Northern Neck Investors LLC is managed on a day-to-day basis by its President, Paul L. Mucci, and as such Mr. Mucci may be deemed to share voting and dispositive power with respect to all shares held by Beacon Bioventures Fund II Limited Partnership. Each of the individuals and entities listed above expressly disclaims beneficial ownership of the securities listed above except to the extent of any pecuniary interest therein. The address for each of the individuals and entities listed above is 100 Summer Street R7B, Boston, Massachusetts 02110.

(3) Consists of (a) 2,588,839 shares of common stock issuable upon conversion of shares of Series A convertible preferred stock and (b) 153,597 shares of common stock issuable upon conversion of shares of Series B convertible preferred stock. HealthCap VI GP SA, L.L.C. (“HCSA”) is the sole general partner of HealthCap VI, L.P. HCSA has voting and dispositive power over the shares held by HealthCap VI, L.P. HCSA disclaims beneficial ownership of such shares, except to the extent of its pecuniary interest therein. Francois Kaiser, Dag Richter, and Daniel Schafer, the members of the board of HCSA, share voting and dispositive power over the shares held by HealthCap VI, L.P. and may be deemed to have indirect beneficial ownership of the shares held by such entities. The members of the board of HCSA disclaim beneficial ownership of shares held by HealthCap VI, L.P. except to the extent of any pecuniary interest therein. The address of HealthCap VI, L.P. is c/o HealthCap VI GP SA, 18, Avenue d Ouchy, 1006 Lausanne, Switzerland.

(4) Consists of 1,727,974 shares of common stock issuable upon conversion of shares of Series B convertible preferred stock. Adage Capital Partners, GP, LLC (“ACPGP”), serves as the general partner of Adage Capital Partners, L.P., a Delaware limited partnership (the “Fund”) and as such has discretion over the portfolio of securities beneficially owned by the Fund. Adage Capital Advisors, LLC, a Delaware limited liability company (“ACA”), is managing member of ACPGP and directs ACPGP’s operations. Robert Atchinson and Phillip Gross are the managing members of ACPGP and ACA and general partners of the Fund. Robert Atchinson and Phillip Gross disclaim beneficial ownership of the reported securities except to the extent of their pecuniary interest therein. The address of Adage Capital Partners, L.P. is 200 Clarendon Street, 52nd Floor, Boston, MA 02116.

(5) Consists of (a) 889,970 shares of common stock issuable upon conversion of shares of Series B convertible preferred stock held by SMALLCAP World Fund, Inc. (“SCWF”) and (b) 607,606 shares of common stock issuable upon conversion of shares of Series B convertible preferred stock held by American Funds Insurance Series — Global Small Capitalization Fund (“VISC”). SCWF and VISC are investment companies registered under the Investment Company Act of 1940, as amended. Capital Research and Management Company (“CRMC”), an investment adviser registered under the Investment Advisers Act of 1940, as amended, is the investment adviser to SCWF and VISC. CRMC provides investment advisory services to SCWF and VISC through its division Capital Research Global Investors (“CRGI”). In that capacity, CRGI may be deemed to be the beneficial owner of the shares of Series B convertible preferred

stock held by SCWF and VISC. CRGI, however, disclaims such beneficial ownership. CRMC has advised that Julian Abdey, Mark E. Denning, Brady L. Enright, J. Blair Frank, Bradford F. Freer, Claudia P. Huntington, Jonathan Knowles, Lawrence Kymisis, Harold H. La, Andraz Razan and Gregory Wendt, as portfolio counselors for SCWF, are primarily responsible for the portfolio management of SCWF, and, as such, have dispositive authority over the shares. CRMC has advised that Mark E. Denning, J. Blair Frank, Claudia P. Huntington, and Harold H. La, as portfolio counselors for VISC, are primarily responsible for the portfolio management of VISC, and, as such, have dispositive authority over the shares. The address for Capital Research and Management Company is 333 S. Hope Street, 55th Floor, Los Angeles, CA 90071.

(6) Consists of (a) 1,235,607 shares of common stock issuable upon conversion of shares of Series A convertible preferred stock held by A.M. Pappas Life Science Ventures IV, L.P., (b) 73,309 shares of common stock issuable upon conversion of shares of Series B convertible preferred stock held by A.M. Pappas Life Science Ventures IV, L.P., (c) 58,808 shares of common stock issuable upon conversion of shares of Series A convertible preferred stock held by PV IV CEO Fund, L.P. and (d) 3,489 shares of common stock issuable upon conversion of shares of Series B convertible preferred stock held by PV IV CEO Fund, L.P. AMP&A Management IV, LLC is the general partner of each of A.M. Pappas Life Science Ventures IV, L.P. and PV IV CEO Fund, L.P. (collectively, the “Pappas Funds”), and AMP&A Management IV, LLC has a management agreement with A.M. Pappas & Associates, LLC whereby A.M. Pappas & Associates, LLC provides management services for the Pappas Funds. As a result, A.M. Pappas & Associates, LLC’s investment committee exercises sole dispositive and voting power over the shares owned by the Pappas Funds. The address for each of A.M. Pappas Life Science Ventures IV, L.P. and PV IV CEO Fund, L.P. is c/o Pappas Ventures, 2520 Meridian Parkway, Suite 400, Durham, NC 27713.

(7) Consists of (a) 31,903 shares of common stock and (b) 26,999 shares of common stock issuable upon conversion of Series A convertible preferred stock that may be acquired pursuant to the exercise of a warrant held by Mr. Aliski.

(8) We expect that this individual will become a member of our board of directors upon the completion of this offering.

(9) Consists of (a) 2,552,241 shares of common stock held by the Emil Kakkis and Jenny Soriano Living Trust, dated June 18, 2009, (b) 624,240 shares of common stock issuable upon conversion of shares of Series A convertible preferred stock held by Dr. Kakkis and (c) 138,855 shares of common stock issuable upon conversion of Series A convertible preferred stock that may be acquired pursuant to the exercise of a warrant held by Dr. Kakkis. Dr. Kakkis shares voting and dispositive power over the 2,552,241 shares of common stock held by the Emil Kakkis and Jenny Soriano Living Trust, dated June 18, 2009; each of Dr. Kakkis and Ms. Soriano is a trustee of such trust. Dr. Kakkis has sole voting and dispositive power over the 624,240 shares of common stock issuable upon conversion of shares of Series A convertible preferred stock and the 138,855 shares of common stock issuable upon conversion of Series A convertible preferred stock that may be acquired pursuant to the exercise of a warrant held by Dr. Kakkis.

(10) Consists of (a) 92,850 shares of common stock, (b) 31,454 shares of common stock issuable upon conversion of Series A convertible preferred stock and (c) 21,102 shares of common stock issuable upon the exercise of stock options within 60 days of January 10, 2014.

(11) Consists of (a) 63,804 shares of common stock and (b) 19,939 shares of common stock issuable upon the exercise of stock options within 60 days of January 10, 2014.

(12) Consists of (a) 3,396,492 shares held by our directors and officers and entities affiliated with certain of our directors, (b) 165,854 shares of common stock issuable upon the conversion of shares of preferred stock that may be acquired pursuant to the exercise of warrants by our certain of our directors and officers, and (c) 41,041 shares of common stock issuable upon the exercise of stock options within 60 days of January 10, 2014 held by our officers.

DESCRIPTION OF CAPITAL STOCK

The following summary describes our capital stock and the material provisions of our amended and restated certificate of incorporation and our amended and restated bylaws, which will become effective immediately prior to the completion of this offering, warrants to purchase shares of our Series A convertible preferred stock, the amended and restated investor rights agreement to which we and certain of our stockholders are parties, and of the Delaware General Corporation Law. Because the following is only a summary, it does not contain all of the information that may be important to you. For a complete description, you should refer to our amended and restated certificate of incorporation, amended and restated bylaws, warrants to purchase shares of our Series A convertible preferred stock, and amended and restated investor rights agreement, copies of which have been filed as exhibits to the registration statement of which this prospectus is part.

General

Upon completion of this offering, our authorized capital stock will consist of 250,000,000 shares of common stock, par value $0.001 per share, and 25,000,000 shares of preferred stock, par value $0.001 per share. The following description of our capital stock is intended as a summary only and is qualified in its entirety by reference to our amended and restated certificate of incorporation, and amended and restated bylaws, each to be in effect at the closing of this offering, which are filed as exhibits to the registration statement, of which this prospectus forms a part, and to the applicable provisions of the Delaware General Corporation Law.

Common Stock

As of September 30, 2013, there were 23,301,502 shares of our common stock outstanding, held of record by 56 stockholders, which assumes the conversion of all outstanding shares of preferred stock for shares of our common stock. Based on shares outstanding as of September 30, 2013, upon completion of this offering, there will be 28,140,212 shares of our common stock outstanding.

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 below in “Anti-Takeover Effects of Delaware Law, Our Certificate of Incorporation and Our By-laws,” the affirmative vote of a majority of our outstanding shares of capital stock is generally required to take action under our Certificate of Incorporation and By-laws.

Preferred Stock

Upon 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 25,000,000 shares of preferred stock in one or more series. The board of directors can fix 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 delaying or preventing a change in control of our company and might harm the market price of our common stock.

Our board of directors will make any determination to issue such shares based on its judgment as to our best interests and the best interests of our stockholders. We have no current plans to issue any shares of preferred stock.

Certain of our stockholders hold, as of the date of this prospectus, 34,349,894 shares of our Series A convertible preferred stock and 27,081,680 shares of our Series B convertible preferred stock. As a result of the reverse stock split we effected on January 17, 2014, each share of Series A and Series B convertible preferred stock outstanding will be converted into shares of our common stock on a 3.1345-for-1 basis. Holders of substantially all of the shares of our preferred stock are subject to lock-up agreements with the underwriters that restrict the sale of our securities for 180 days following the date of this prospectus. See "Underwriting" for a description of these lock-up agreements.

Warrants

As of September 30, 2013, warrants to purchase a total of 1,027,662 shares of our Series A convertible preferred stock were outstanding with an exercise price of $1.034 per share. These warrants to purchase 1,027,662 shares of Series A convertible preferred stock, which will be converted into warrants to purchase 327,853 shares of common stock with an exercise price of $3.241 per share upon completion of this offering, are exercisable immediately and each expire on the first to occur of (i) the closing date of any reorganization, consolidation or merger of the Company, transfer of all or substantially all of the assets of the Company or any simultaneous sale of more than a majority of the then outstanding securities of the Company other than a mere reincorporation transaction, or (ii) the 10 year anniversary of the date of such warrant which in the case of the outstanding warrants of the Company is June 2020, February 2021 and June 2021, respectively.

Registration Rights

We are party to an amended and restated investors' rights agreement, dated as of December 18, 2012, with the holders of shares of our common stock issuable upon conversion of the shares of preferred stock. Following this offering, the holders of approximately 19.6 million shares, or 19.9 million including the shares underlying outstanding warrants, will have the right to require us to register their shares under the Securities Act of 1933, as amended. These shares will represent approximately 70% of our outstanding common stock after this offering, or approximately 69% if the underwriters exercise their option to purchase additional shares in full. These shares also may be sold under Rule 144 under the Securities Act of 1933, depending on their holding period and subject to restrictions in the case of shares held by persons deemed to be our affiliates. The registration rights will terminate upon the later of (i) the fifth anniversary of the closing date of this offering and (ii) as to any holder of registrable securities, such earlier time after this offering at which such holder holds 1% or less of our common stock and all registrable securities held by such holder can be sold in any 90-day period without registration in compliance with Rule 144.

Demand Registration Rights

Under the amended and restated investors' rights agreement, beginning 180 days following the effectiveness of the registration statement of which this prospectus forms a part or 45 days following the effective date of any other Company-initiated registration statement, the holders of at least 50% of the registrable shares (or a lesser percentage if the anticipated aggregate offering price is not less than $10 million) then outstanding can, on not more than two occasions, demand that we file a registration statement or request that their shares be included on a registration statement that we are otherwise filing, in either case, registering the resale of their shares of common stock. We are required to use our best efforts to effect the registration and will pay all registration expenses, other than underwriting discounts and commissions, related to any demand registration. These registration rights are subject to conditions and limitations, including the right, in certain circumstances, of the underwriters of an offering to limit the number of shares included in such registration and our right, in certain circumstances, not to effect a requested registration.

Piggyback Registration Rights

If we propose to register any of our securities under the Securities Act for our own account or the account of any other holder, the "significant holders" (as defined in the amended and restated investors' rights agreement) are entitled to notice of such registration and to request that we include registrable shares for resale on such registration statement, subject to the right of any underwriter to limit the number of shares included in such registration.

We will pay all registration expenses, other than underwriting discounts and commissions, related to any piggyback registration. The amended and restated investors' rights agreement contains customary cross-indemnification provisions, pursuant to which we are obligated to indemnify the selling stockholders, in the event of misstatements or omissions in the registration statement attributable to us and they are obligated to indemnify us for misstatements or omissions attributable to them.

Form S-3 Registration Rights

The holders of at least 10% of the registrable securities outstanding can make a written request that we register their shares on Form S-3 if we are eligible to file a registration statement on Form S-3 and if the aggregate price to the public of the shares offered is at least $1 million. These stockholders may make an unlimited number of requests for registration on Form S-3. However, we will not be required to effect a registration on Form S-3 if we determine that such a registration would be seriously detrimental to us and our stockholders or if we have already effected three registration statements on Form S-3 in the 12-month period preceding the date of the request. We will pay all registration expenses, other than underwriting discounts and commissions, related to any S-3 registration.

Voting Agreement, Right of First Refusal and Co-Sale Agreement and Market Stand-Off Provision

We are party to an amended and restated voting agreement and an amended and restated right of first refusal and co-sale agreement, each dated as of December 18, 2012, with all holders of our preferred stock and certain holders of our common stock. These agreements provide for certain rights and obligations, such as rights to designate and covenants with regard to voting for board members and stock transfer restrictions. These agreements will terminate upon the completion of this offering. The market stand-off provision under our amended and restated investors' rights agreement shall survive the completion of this offering. See "Shares Eligible for Future Sales—Lock-Up Agreements."

Anti-Takeover Effects of Delaware Law, our Certificate of Incorporation and Our By-laws

Our certificate of incorporation and by-laws include a number of provisions that may have the effect of encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our board of directors rather than pursue non-negotiated takeover attempts. These provisions include the items described below.

Board Composition and Filling Vacancies

In accordance with our certificate of incorporation, our board is divided into three classes serving three-year terms, with one class being elected each year. Our certificate of incorporation also provides that directors may be removed only for cause. Furthermore, any vacancy on our board of directors, however occurring, including a vacancy resulting from an increase in the size of our board, may only be filled by a resolution of the board.

No Written Consent of Stockholders

Our certificate of incorporation provides that all stockholder actions are required to be taken by a vote of the stockholders at an annual or special meeting, and that stockholders may not take any action by written consent in lieu of a meeting.

Meetings of Stockholders

Our certificate of incorporation and by-laws provide that, subject to any rights of holders of any series of preferred stock, only the board or the chairman of the board may call special meetings of stockholders and only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders. Our by-laws limit the business that may be conducted at an annual meeting of stockholders to those matters properly brought before the meeting.

Advance Notice Requirements

Our by-laws establish advance notice procedures with regard to stockholder proposals relating to the nomination of candidates for election as directors or new business to be brought before meetings of our stockholders. These procedures provide that notice of stockholder proposals must be timely given in writing to our corporate secretary prior to the meeting at which the action is to be taken. Generally, to be timely, notice must be received at our principal executive offices not less than 90 days or more than 120 days prior to the first anniversary date of the annual meeting for the preceding year. The notice must contain certain information specified in the by-laws. These provisions may have the effect of precluding the conduct of certain business at a meeting if the proper procedures are not followed. These provisions may also discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of our company.

Amendment to By-laws and Certificate of Incorporation

As required by the Delaware General Corporation Law, any amendment of our certificate of incorporation must first be approved by a majority of our board of directors and, if required by law or our certificate of incorporation, thereafter be approved by a majority of the outstanding shares entitled to vote on the amendment, and a majority of the outstanding shares of each class entitled to vote thereon as a class, except that the amendment of the provisions relating to directors, stockholders, the amendment of our by-laws and certificate of incorporation and exclusive jurisdiction of Delaware Courts must be approved by not less than 75% of the outstanding shares entitled to vote on the amendment, and not less than 75% of the outstanding shares of each class entitled to vote thereon as a class. Our by-laws may be amended by the affirmative vote of a majority of the directors then in office, subject to any limitations set forth in the by-laws, and may also be amended by the affirmative vote of at least 75% of the outstanding shares entitled to vote on the amendment.

Blank Check Preferred Stock

Our certificate of incorporation provides for 25,000,000 authorized shares of preferred stock. The existence of authorized but unissued shares of preferred stock may enable our board of directors to render more difficult or to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise. For example, if in the due exercise of its fiduciary obligations, our board of directors were to determine that a takeover proposal is not in the best interests of us or our stockholders, our board of directors could cause shares of preferred stock to be issued without stockholder approval in one or more private offerings or other transactions that might dilute the voting or other rights of the proposed acquirer or insurgent stockholder or stockholder group. In this regard, our certificate of incorporation grants our board of directors broad power to establish the rights and preferences of authorized and unissued shares of preferred stock. The issuance of shares of preferred stock could decrease the amount of earnings and assets available for distribution to holders of shares of common stock. The issuance may also adversely affect the rights and powers, including voting rights, of these holders and may have the effect of delaying, deterring or preventing a change in control of us.

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 85% 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 by-laws 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.

Exclusive Jurisdiction of Certain Actions

Our certificate of incorporation requires, to the fullest extent permitted by law, that derivative actions brought in our name, actions against our directors, officers and employees for breach of fiduciary duty and other similar actions may be brought only in the Court of Chancery in the State of Delaware, unless we otherwise consent. Although we believe this provision benefits us by providing increased consistency in the application of Delaware law in the types of lawsuits to which it applies, the provision may have the effect of discouraging lawsuits against our directors and officers. Although our certificate of incorporation contains the choice of forum provision described above, it is possible that a court could rule that such a provision is inapplicable for a particular claim or action or that such provision is unenforceable.

NASDAQ Global Market listing

We have applied for listing of our common stock on The NASDAQ Global Market under the symbol "RARE".

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company, LLC. The transfer agent and registrar's address is 620 15th Avenue, Brooklyn, New York 11219.

SHARES ELIGIBLE FOR FUTURE SALE

Prior to this offering, there has been no public market for our common stock. Future sales of our common stock, including shares issued upon the exercise of outstanding options or warrants, in the public market after this offering, or the perception that those sales may occur, could cause the prevailing market price for our common stock to fall or impair our ability to raise equity capital in the future. As described below, only a limited number of shares of our common stock will be available for sale in the public market for a period of several months after completion of this offering due to contractual and legal restrictions on resale described below. Future sales of our common stock in the public market either before (to the extent permitted) or after restrictions lapse, or the perception that those sales may occur, could adversely affect the prevailing market price of our common stock at such time and our ability to raise equity capital at a time and price we deem appropriate.

Sale of Restricted Shares

As of September 30, 2013, based on the number of shares of our common stock then outstanding and assuming an initial public offering price of $15.50 per share (the midpoint of the price range set forth on the cover page of this prospectus), upon the closing of this offering, and assuming (1) the conversion of our outstanding preferred stock into shares of our common stock, (2) no exercise of the underwriters' option to purchase additional shares of common stock and (3) no exercise of outstanding options or warrants, we would have had outstanding an aggregate of approximately 28,140,212 shares of common stock. Of these shares, all of the 4,838,710 shares of common stock to be sold in this offering, and any shares sold upon exercise of the underwriters' option to purchase additional shares, other than the shares purchased by our directors and officers in the directed share program, will be freely tradable in the public market without restriction or further registration under the Securities Act of 1933, as amended, or the Securities Act, unless the shares are held by any of our "affiliates" as such term is defined in Rule 144 of the Securities Act. All remaining shares of common stock held by existing stockholders immediately prior to the completion of this offering will be "restricted securities" as such term is defined in Rule 144. These restricted securities were issued and sold by us in private transactions and are eligible for public sale only if registered under the Securities Act or if they qualify for an exemption from registration under the Securities Act, including the exemptions provided by Rule 144 or Rule 701, which rules are summarized below.

As a result of the lock-up agreements referred to below and the provisions of Rule 144 and Rule 701 under the Securities Act, the shares of our common stock (excluding the shares sold in this offering) that will be available for sale in the public market are as follows:

Approximate Number of Shares	First Date Available for Sale into Public Market
23,208,750	180 days after the date of this prospectus upon expiration of the lock-up agreements referred to below, subject in some cases to applicable volume limitations under Rule 144

Lock-Up Agreements and Market Stand-Off Provision

In connection with this offering, we, our directors, our executive officers, substantially all of our stockholders, and substantially all of our option holders who are not also stockholders have agreed, subject to certain exceptions, with the underwriters not to dispose of or hedge any shares of our common stock or securities convertible into or exchangeable for shares of common stock during the period from the date of the lock-up agreement continuing through the date 180 days after the date of this prospectus, except with the prior written consent of J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC, together the representatives of the underwriters. The representatives of the underwriters have advised us that they have no current intent or arrangement to release any of the shares subject to the lock-up agreements prior to the expiration of the lock-up period.

Following the lock-up periods set forth in the agreements described above, and assuming that the representatives of the underwriters do not release any parties from these agreements, 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, pursuant to our amended and restated investors' rights agreement, the parties thereto have agreed under a market stand-off provision that, subject to certain conditions, they will not, directly or indirectly, without the prior written consent of the Company and the managing underwriter, during the same 180-day restricted period referred to above, (i) lend, offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for common stock or (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of common stock.

As of the date of this prospectus, holders of approximately 23.2 million shares of common stock (including shares of our preferred stock that will be converted into shares of our common stock upon completion of this offering), or 99.6% of our outstanding shares of common stock on an as-converted basis, are, collectively subject to lock-up restrictions as parties to these agreements or lock-up agreements with the underwriters.

Rule 144

In general, under Rule 144, as currently in effect, once we have been subject to the public company reporting requirements of the Securities Exchange Act of 1934, as amended, or the Exchange Act, for at least 90 days, a person (or persons whose shares are required to be aggregated) who is not deemed to have been one of our "affiliates" for purposes of Rule 144 at any time during the three months preceding a sale, and who has beneficially owned restricted securities within the meaning of Rule 144 for at least six months, including the holding period of any prior owner other than one of our "affiliates," is entitled to sell those shares in the public market (subject to the lock-up agreement referred to above, if applicable) without complying with the manner of sale, volume limitations or notice provisions of Rule 144, but 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 "affiliates," then such person is entitled to sell such shares in the public market without complying with any of the requirements of Rule 144 (subject to the lock-up agreement referred to above, if applicable).

In general, under Rule 144, as currently in effect, once we have been subject to the public company reporting requirements of the Exchange Act for at least 90 days, our "affiliates," as defined in Rule 144, who have beneficially owned the shares proposed to be sold for at least six months are entitled to sell in the public market, upon expiration of any applicable lock-up agreements and within any three-month period, a number of those shares of our common stock that does not exceed the greater of:

- one percent of the number of common shares then outstanding, which will equal approximately 281,402 shares of common stock immediately after this offering (calculated on the basis of the number of shares of our common stock outstanding as of September 30, 2013, the assumptions described above and assuming no exercise of the underwriter's option to purchase additional shares and no exercise of outstanding options or warrants); or
- the average weekly trading volume of 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.

Such sales under Rule 144 by our "affiliates" or persons selling shares on behalf of our "affiliates" are also subject to certain manner of sale provisions, notice requirements and to the availability of current public information about us.

Notwithstanding the availability of Rule 144, the holders of substantially all of our restricted securities have entered into lock-up agreements as referenced above and their restricted securities will become eligible for sale (subject to the above limitations under Rule 144) upon the expiration of the restrictions set forth in those agreements.

Rule 701

In general, under Rule 701 as currently in effect, any of our employees, directors, officers, consultants or advisors who acquired common stock from us in connection with a written compensatory stock or option plan or other written agreement in compliance with Rule 701 under the Securities Act before the effective date of the registration statement of which this prospectus is a part (to the extent such common stock is not subject to a lock-up agreement) is entitled to rely on Rule 701 to resell such shares beginning 90 days after we become subject to the public company reporting requirements of the Exchange Act in reliance on Rule 144, but without compliance with the holding period requirements contained in Rule 144. Accordingly, subject to any applicable lock-up agreements, beginning 90 days after we become subject to the public company reporting requirements of the Exchange Act, under Rule 701 persons who are not our "affiliates," as defined in Rule 144, may resell those shares without complying with the minimum holding period or public information requirements of Rule 144, and persons who are our "affiliates" may resell those shares without compliance with Rule 144's minimum holding period requirements (subject to the terms of the lock-up agreement referred to below, if applicable).

Equity Incentive Plans and Employee Stock Purchase Plan

We intend to file with the SEC a registration statement under the Securities Act covering the shares of common stock that we may issue (i) upon exercise of outstanding options under the 2011 Equity Incentive Plan and reserved for issuance under the 2014 Incentive Plan, and (ii) pursuant to the 2014 Employee Stock Purchase Plan. Such registration statement is expected to be filed and become effective as soon as practicable after the completion of this offering. Accordingly, shares registered under such registration statement will be available for sale in the open market following its effective date, subject to Rule 144 volume limitations and the lock-up agreements described above, if applicable.

MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES TO NON-U.S. HOLDERS

The following discussion is a summary of the material U.S. federal income tax consequences to non-U.S. holders (as defined below) of the purchase, ownership and disposition of our common stock issued pursuant to this offering, but does not purport to be a complete analysis of all potential tax effects. The effects of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local or foreign tax laws are not discussed. This discussion is based on the Internal Revenue Code of 1986, as amended, or the Code, Treasury Regulations promulgated under the Code, judicial decisions, and published rulings and administrative pronouncements of the U.S. Internal Revenue Service, or IRS, in effect as of the date of this offering. These authorities may change or be subject to differing interpretations. Any such change may be applied retroactively in a manner that could adversely affect a non-U.S. holder of our common stock. We have not sought and will not seek any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a contrary position regarding the tax consequences of the purchase, ownership and disposition of our common stock.

This discussion is limited to non-U.S. holders that hold our common stock as a "capital asset" within the meaning of Section 1221 of the Code (property held for investment). This discussion does not address all U.S. federal income tax consequences relevant to a non-U.S. holder's particular circumstances. In addition, it does not address consequences relevant to non-U.S. holders subject to particular rules, including, without limitation:

- U.S. expatriates and certain former citizens or long-term residents of the United States;
- persons subject to the alternative minimum tax;
- persons holding our common stock as part of a hedge, straddle or other risk reduction strategy or as part of a conversion transaction or other integrated investment;
- banks, insurance companies and other financial institutions;
- real estate investment trusts or regulated investment companies;
- brokers, dealers or traders in securities;
- "controlled foreign corporations," "passive foreign investment companies" and corporations that accumulate earnings to avoid U.S. federal income tax;
- S corporations, partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes;
- tax-exempt organizations or governmental organizations;
- persons deemed to sell our common stock under the constructive sale provisions of the Code;
- persons who hold or receive our common stock pursuant to the exercise of any employee stock option or otherwise as compensation; and
- tax-qualified retirement plans.

If a partnership (or other entity treated as a partnership for U.S. federal income tax purposes) holds our common stock, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of the partnership and certain determinations made at the partner level. Accordingly, partnerships holding our common stock and the partners in such partnerships should consult their tax advisors regarding the U.S. federal income tax consequences to them.

THIS DISCUSSION IS FOR INFORMATION PURPOSES ONLY AND IS NOT INTENDED AS TAX ADVICE. INVESTORS SHOULD CONSULT THEIR TAX ADVISORS WITH RESPECT TO THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AS WELL AS ANY TAX CONSEQUENCES OF THE PURCHASE, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK ARISING UNDER THE U.S. FEDERAL ESTATE OR GIFT TAX LAWS OR UNDER THE LAWS OF ANY STATE, LOCAL OR NON-U.S. TAXING JURISDICTION OR UNDER ANY APPLICABLE INCOME TAX TREATY.

Definition of a Non-U.S. Holder

For purposes of this discussion, a "non-U.S. holder" is any beneficial owner of our common stock that is neither a "U.S. person" nor a partnership for United States federal income tax purposes. A U.S. person is any of the following:

- an individual who is a citizen or resident of the United States;
- a corporation (or other entity taxable as a corporation for U.S. federal income tax purposes) created or organized under the laws of the United States, any state thereof, or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (1) is subject to the primary supervision of a U.S. court and the control of one or more United States persons (within the meaning of Section 7701(a)(30) of the Code), or (2) has a valid election in effect to be treated as a United States person for U.S. federal income tax purposes.

Distributions

As described in the section entitled "Dividend Policy," we do not anticipate declaring or paying dividends to holders of our common stock in the foreseeable future. However, if we do make distributions on our common stock, such distributions of cash or property on our common stock will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. Amounts not treated as dividends for U.S. federal income tax purposes will constitute a return of capital and first be applied against and reduce a non-U.S. holder's adjusted tax basis in its common stock, but not below zero. Any excess will be treated as capital gain and will be treated as described below in the section titled "— Sale or Other Taxable Disposition."

Dividends paid to a non-U.S. holder of our common stock generally will be subject to U.S. federal withholding tax at a rate of 30% of the gross amount of the dividends (or such lower rate specified by an applicable income tax treaty). Even if a non-U.S. holder is eligible for a lower treaty rate, dividend payments will generally be subject to withholding at a 30% rate (rather than the lower treaty rate) unless the non-U.S. holder provides a valid IRS Form W-8BEN (or applicable successor form) certifying such holder's qualification for the reduced rate.

Non-U.S. holders who do not timely provide us or our paying agent with the required certification, but who qualify for a reduced treaty rate, may obtain a refund of any excess amounts withheld by timely filing an appropriate claim for refund with the IRS. Non-U.S. holders should consult their tax advisors regarding their entitlement to benefits under a tax treaty.

Subject to the discussions below regarding backup withholding and foreign accounts, if dividends paid to a non-U.S. holder are effectively connected with the non-U.S. holder's conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the non-U.S. holder maintains a permanent establishment in the United States to which such dividends are attributable), the non-U.S. holder will be exempt from U.S. federal withholding tax. To claim the exemption, the non-U.S. holder must furnish to us or our paying agent a valid IRS Form W-8ECI (or applicable successor form), certifying that the dividends are effectively connected with the non-U.S. holder's conduct of a trade or business within the United States.

Any dividends paid on our common stock that are effectively connected with a non-U.S. holder's U.S. trade or business (and, if required by an applicable tax treaty, attributable to a permanent establishment maintained by the non-U.S. holder in the United States) generally will be subject to U.S. federal income tax on a net income basis in the same manner as if such holder were a U.S. person. A non-U.S. holder that is a corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable tax treaty) of a portion of its effectively connected earnings and profits for the taxable year. Non-U.S. holders should consult their tax advisors regarding any applicable tax treaties that may provide for different rules.

Sale or Other Taxable Disposition

Subject to the discussions below regarding backup withholding and foreign accounts, a non-U.S. holder will not be subject to U.S. federal income tax on any gain realized upon the sale or other disposition of our common stock unless:

- the gain is effectively connected with the non-U.S. holder's conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the non-U.S. holder maintains a permanent establishment in the United States to which such gain is attributable);
- the non-U.S. holder is a nonresident alien individual present in the United States for 183 days or more during the taxable year of the disposition and certain other requirements are met; or
- our common stock constitutes a U.S. real property interest, or USRPI, by reason of our status as a U.S. real property holding corporation, or a USRPHC, for U.S. federal income tax purposes.

Gain described in the first bullet point above will generally be subject to U.S. federal income tax on a net income basis at the regular graduated U.S. federal income tax rates. A non-U.S. holder that is a foreign corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected gain, as adjusted for certain items.

A non-U.S. holder described in the second bullet point above will be subject to U.S. federal income tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on any gain derived from the disposition, which may be offset by certain U.S. source capital losses of the non-U.S. holder (even though the individual is not considered a resident of the United States) provided the non-U.S. holder has timely filed U.S. federal income tax returns with respect to such losses.

With respect to the third bullet point above, we believe we are not currently 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 USRPIs relative to the fair market value of our other business assets and our non-U.S. real property interests, there can be no assurance we are not a USRPHC or will not become one in the future. Even if we are or were to become a USRPHC, gain arising from the sale or other taxable disposition by a non-U.S. holder of our common stock will not be subject to U.S. federal income tax if our common stock is "regularly traded," as defined by applicable Treasury Regulations, on an established securities market, and such non-U.S. holder owned, actually or constructively, 5% or less of our common stock throughout the shorter of the five-year period ending on the date of the sale or other disposition or the non-U.S. holder's holding period.

Non-U.S. holders should consult their tax advisors regarding potentially applicable income tax treaties that may provide for different rules.

Information Reporting and Backup Withholding

A non-U.S. holder will not be subject to backup withholding with respect to payments of dividends on our common stock we make to the non-U.S. holder, provided the holder certifies its non-U.S. status, such as by providing a valid IRS Form W-8BEN or W-8ECI, or otherwise establishes an exemption. However, information returns will be filed with the IRS in connection with any dividends on our common stock paid to the non-U.S. holder, regardless of whether any tax was actually withheld. Copies of these information returns may also be made available under the provisions of a specific treaty or agreement to the tax authorities of the country in which the non-U.S. holder resides or is established.

Information reporting and, depending on the circumstances, backup withholding will apply to the proceeds of a sale of our common stock within the United States or conducted through certain U.S.-related financial intermediaries, unless the beneficial owner certifies under penalty of perjury that it is a non-U.S. holder on Form W-8BEN or other applicable form or such owner otherwise establishes an exemption.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a non-U.S. holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

Additional Withholding Tax on Payments Made to Foreign Accounts

Legislation incorporating provisions referred to as the Foreign Account Tax Compliance Act, or "FATCA," was enacted March 18, 2010. A 30% withholding tax may be imposed on dividends paid on, and the gross proceeds from the sale or other disposition of, our common stock paid to a "foreign financial institution" (as defined in the Code) or to a "non-financial foreign entity" (as defined in the Code) (whether such foreign financial institution or non-financial foreign entity is the beneficial owner or an intermediary), unless (1) the foreign financial institution undertakes certain diligence and reporting obligations, (2) the non-financial foreign entity either certifies it does not have any "substantial United States owners" (as defined in the Code) or furnishes identifying information regarding each substantial United States owner, or (3) the foreign financial institution or non-financial foreign entity otherwise qualifies for an exemption from these rules. If the payee is a foreign financial institution and is subject to the diligence and reporting requirements in (1) above, it must enter into an agreement with the U.S. Department of the Treasury requiring, among other things, that it undertake to identify accounts held by certain U.S. persons or U.S.-owned foreign entities (as defined in applicable Treasury Regulations), annually report certain information about such accounts, and withhold 30% on payments to non-compliant foreign financial institutions and certain other account holders. Foreign governments may enter into an agreement with the IRS to implement FATCA in a different manner. Under current IRS guidance, FATCA withholding will apply to payments of dividends on our common stock made on or after July 1, 2014, and to payments of gross proceeds from the sale or other disposition of such stock on or after January 1, 2017. Prospective investors should consult their tax advisors regarding these withholding provisions.

UNDERWRITING

We are offering the shares of common stock described in this prospectus through a number of underwriters. J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC are acting as joint book-running managers of the offering and as representatives of the underwriters. We have entered into an underwriting agreement with the underwriters. Subject to the terms and conditions of the underwriting agreement, we have agreed to sell to the underwriters, and each underwriter has severally agreed to purchase, at the public offering price less the underwriting discounts and commissions set forth on the cover of this prospectus, the number of shares of common stock listed next to its name in the following table:

Name	Number of shares
J.P. Morgan Securities LLC	
Morgan Stanley & Co. LLC	
Cowen and Company, LLC	
Canaccord Genuity Inc.	
Total	4,838,710

The underwriters are committed to purchase all the shares of common stock offered by us if they purchase any shares. The underwriting agreement also provides that if an underwriter defaults, the purchase commitments of non-defaulting underwriters may also be increased or the offering may be terminated.

The underwriters propose to offer the shares of common stock directly to the public at the initial public offering price set forth on the cover of this prospectus and to certain dealers at that price less a concession not in excess of $ per share. Any such dealers may resell shares to certain other brokers or dealers at a discount of up to $ per share from the initial public offering price. After the initial public offering of the shares, the offering price and other selling terms may be changed by the underwriters. Sales of shares made outside of the United States may be made by affiliates of the underwriters.

The underwriters have an option to buy up to 725,806 additional shares of common stock from us to cover sales of shares by the underwriters which exceed the number of shares specified in the table above. The underwriters have 30 days from the date of this prospectus to exercise this option to purchase additional shares. If any shares are purchased with this option to purchase additional shares, the underwriters will purchase shares in approximately the same proportion as shown in the table above.

The underwriting fee is equal to the public offering price per share of common stock less the amount paid by the underwriters to us per share of common stock. The underwriting fee is $ per share. The following table shows the per share and total underwriting discounts and commissions to be paid to the underwriters assuming both no exercise and full exercise of the underwriters' option to purchase additional shares.

	Without exercise of option to purchase additional shares	With full exercise of option to purchase additional shares
Per share	$	$
Total	$	$

We estimate that the total expenses of this offering, including registration, filing and listing fees, printing fees and legal and accounting expenses, but excluding the underwriting discounts and commissions, will be approximately $3.0 million. We have agreed to reimburse the underwriters for all expenses relating to the clearance of this offering with the Financial Industry Regulatory Authority (in an amount not to exceed $25,000).

A prospectus in electronic format may be made available on the web sites maintained by one or more underwriters, or selling group members, if any, participating in the offering. The underwriters may agree to allocate a number of shares to underwriters and selling group members for sale to their online brokerage account holders. Internet distributions will be allocated by the representatives to underwriters and selling group members that may make Internet distributions on the same basis as other allocations.

We have agreed that we will not (i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, or file with the Securities and Exchange Commission a registration statement under the Securities Act of 1933, as amended (the "Securities Act"), relating to, any shares of our common stock or any securities convertible into or exchangeable or exercisable for any shares of our common stock, or publicly disclose the intention to make any offer, sale, pledge, disposition or filing, or (ii) enter into any swap or other arrangement that transfers all or a portion of the economic consequences associated with the ownership of any shares of our common stock or any such other securities (regardless of whether any of these transactions are to be settled by the delivery of shares of our common stock or such other securities, in cash or otherwise), in each case without the prior written consent of J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC for a period of 180 days after the date of this prospectus, other than (i) the shares of our common stock to be sold hereunder, (ii) any shares of our common stock issued upon the exercise of options granted under our existing management incentive plans or warrants described as outstanding in the registration statement of which this prospectus forms a part, (iii) any options and other awards granted under an equity incentive plan described in the registration statement of which this prospectus forms a part, (iv) our filing of any registration statement on Form S-8 or a successor form thereto relating to an equity incentive plan described in the registration statement of which this prospectus forms a part, and (v) shares of common stock or other securities issued in connection with a transaction with an unaffiliated third party that includes a bona fide commercial relationship (including joint ventures, marketing or distribution arrangements, collaboration agreements or intellectual property license agreements) or any acquisition of assets or acquisition of not less than a majority or controlling portion of the equity of another entity, provided that (x) the aggregate number of shares issued pursuant to this clause (v) shall not exceed five percent (5%) of the total number of outstanding shares of common stock immediately following the issuance and sale of the shares of common stock in this offering and (y) the recipient of any such shares of common stock and securities issued pursuant to this clause (v) during the 180-day restricted period described above shall enter into a lock-up agreement.

Our directors and executive officers, and substantially all of our stockholders have entered into lock-up agreements with the underwriters prior to the commencement of this offering pursuant to which each of these persons or entities, with limited exceptions, for a period of 180 days after the date of this prospectus, may not, without the prior written consent of J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC, (1) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for our common stock (including without limitation, common stock or such other securities which may be deemed to be beneficially owned by such directors, executive officers and shareholders in accordance with the rules and regulations of the Securities and Exchange Commission and securities which may be issued upon exercise of a stock option or warrant), or publicly disclose the intention to make any offer, sale, pledge or disposition, (2) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of our common stock or such other securities, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of common stock or such other securities, in cash or otherwise or (3) make any demand for or exercise any right with respect to the registration of any shares of our common stock or any security convertible into or exercisable or exchangeable for our common stock. The restrictions described in the immediately preceding paragraph to do not apply to:

- transfers or dispositions of shares of common stock (or any security convertible into or exercisable or exchangeable for common stock):
  - as a bona fide gift;
  - to any trust for the direct or indirect benefit of the party subject to the lock-up restrictions or the immediate family of such person;
  - to any corporation, partnership, limited liability company, investment fund or other entity controlled or managed, or under common control or management by the party subject to the lock-up restrictions or the immediate family of such person;

- by will, other testamentary document or intestate succession to the legal representative, heir, beneficiary or a member of the immediate family of the party subject to the lockup restrictions; and
- as distributions to partners, members or stockholders of the party subject to the lock-up restrictions,

provided that in the case of any transfer or distribution pursuant to the above five subclauses, (i) each donee or distributee shall sign and deliver a lock-up letter substantially in the form executed by the party subject to the lock up restrictions and (ii) no filing under Section 16(a)of the Exchange Act, reporting a reduction in beneficial ownership of shares of common stock, shall be required or shall be voluntarily made during the restricted period (other than a filing on Form 5);

- the establishment of a trading plan pursuant to Rule 10b5-1 under the Exchange Act for the transfer of shares of common stock, *provided* that (i) such plan does not provide for the transfer of common stock during the restricted period and (ii) no filing under the Exchange Act or other public announcement shall be required or voluntarily made by or on behalf of the party subject to the lock-up restrictions regarding the establishment of such plan;
- the exercise of options to purchase shares of common stock granted under any stock incentive plan or stock purchase plan of the Company, *provided* that the underlying shares shall continue to be subject to the restrictions on transfer set forth in this agreement and *provided further* that no filing under Section 16(a) of the Exchange Act shall be required or shall be voluntarily made during the restricted period (other than a filing on Form 5);
- the exercise (whether for cash, cashless, or net exercise) of warrants to purchase shares of common stock (or any security convertible into or exercisable or exchangeable for common stock), *provided* that the underlying shares shall continue to be subject to the lock-up restrictions and *provided further* that, other than in respect of warrants that will expire or automatically exercise by their terms in connection with this offering, no filing under Section 16(a) of the Exchange Act shall be required or shall be voluntarily made during the restricted period (other than a filing on Form 5);
- the transfer of shares of common stock (or any security convertible into common stock) to the Company or sold in connection with a vesting event of the Company's securities or upon the exercise of options to purchase the Company's securities, on a "cashless" or "net exercise" basis or to cover tax withholding obligations of the party subject to the lock-up restrictions in connection with such vesting or exercise *provided* that no filing under Section 16(a) of the Exchange Act shall be required or shall be voluntarily made during the restricted period (other than a filing on Form 5);
- the transfer or disposition of the shares of common stock (or any security convertible into or exercisable or exchangeable for common stock) held by the party subject to the lock-up restrictions that occurs by operation of law, such as pursuant to a qualified domestic order or in connection with a divorce settlement *provided* that each transferee shall sign and deliver a lock-up letter substantially in the form executed by the party subject to the lock-up restrictions;
- the transfer of shares of common stock (or any security convertible into or exercisable or exchangeable for common stock) pursuant to a bona fide third party tender offer, merger, consolidation or other similar transaction made to all holders of the common stock involving a change of control of the Company, *provided* that in the event that the tender offer, merger, consolidation or other such transaction is not completed, the common stock owned by the party subject to the lock-up restrictions shall remain subject to such restrictions; or
- transactions by any person other than us relating to shares of common stock or other securities acquired in open market transactions after the completion of the offering of the shares, *provided* that no filing under Section 16(a) of the Exchange Act is required or voluntarily made in connection with subsequent sales of the common stock or other securities acquired in such open market transactions (other than a filing on Form 5).

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act of 1933, as amended.

We have applied to have our common stock approved for listing/quotation on The NASDAQ Global Market under the symbol “RARE.”

In connection with this offering, the underwriters may engage in stabilizing transactions, which involves making bids for, purchasing and selling shares of common stock in the open market for the purpose of preventing or retarding a decline in the market price of the common stock while this offering is in progress. These stabilizing transactions may include making short sales of the common stock, which involves the sale by the underwriters of a greater number of shares of common stock than they are required to purchase in this offering, and purchasing shares of common stock on the open market to cover positions created by short sales. Short sales may be “covered” shorts, which are short positions in an amount not greater than the underwriters’ option to purchase additional shares referred to above, or may be “naked” shorts, which are short positions in excess of that amount. The underwriters may close out any covered short position either by exercising their option to purchase additional shares, in whole or in part, or by purchasing shares in the open market. In making this determination, the underwriters will consider, among other things, the price of shares available for purchase in the open market compared to the price at which the underwriters may purchase shares through the option to purchase additional shares. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the common stock in the open market that could adversely affect investors who purchase in this offering. To the extent that the underwriters create a naked short position, they will purchase shares in the open market to cover the position.

The underwriters have advised us that, pursuant to Regulation M of the Securities Act, they may also engage in other activities that stabilize, maintain or otherwise affect the price of the common stock, including the imposition of penalty bids. This means that if the representatives of the underwriters purchase common stock in the open market in stabilizing transactions or to cover short sales, the representatives can require the underwriters that sold those shares as part of this offering to repay the underwriting discount received by them.

These activities may have the effect of raising or maintaining the market price of the common stock or preventing or retarding a decline in the market price of the common stock, and, as a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. If the underwriters commence these activities, they may discontinue them at any time. The underwriters may carry out these transactions on The NASDAQ Global Market, in the over-the-counter market or otherwise.

Prior to this offering, there has been no public market for our common stock. The initial public offering price will be determined by negotiations between us and the representatives of the underwriters. In determining the initial public offering price, we and the representatives of the underwriters expect to consider a number of factors including:

- the information set forth in this prospectus and otherwise available to the representatives;
- our prospects and the history and prospects for the industry in which we compete;
- an assessment of our management;
- our prospects for future earnings;
- the general condition of the securities markets at the time of this offering;
- the recent market prices of, and demand for, publicly traded common stock of generally comparable companies; and
- other factors deemed relevant by the underwriters and us.

Neither we nor the underwriters can assure investors that an active trading market will develop for our common shares, or that the shares will trade in the public market at or above the initial public offering price.

At our request, the underwriters have reserved approximately up to 241,935 shares of our common stock offered by this prospectus for sale, at the initial public offering price, to our directors and officers and certain

employees and other parties related to us. Shares purchased by our directors and officers will be subject to the 180-day lock-up restriction described above. The number of shares of common stock available for sale to the general public will be reduced to the extent these individuals purchase such reserved shares. Any reserved shares that are not so purchased will be offered by the underwriters to the general public on the same basis as the other shares offered by this prospectus.

Selling restrictions

General

Other than in the United States, no action has been taken by us or the underwriters that would permit a public offering of the securities offered by this prospectus in any jurisdiction where action for that purpose is required. The securities offered by this prospectus may not be offered or sold, directly or indirectly, nor may this prospectus or any other offering material or advertisements in connection with the offer and sale of any such securities be distributed or published in any jurisdiction, except under circumstances that will result in compliance with the applicable rules and regulations of that jurisdiction. Persons into whose possession this prospectus comes are advised to inform themselves about and to observe any restrictions relating to the offering and the distribution of this prospectus. This prospectus does not constitute an offer to sell or a solicitation of an offer to buy any securities offered by this prospectus in any jurisdiction in which such an offer or a solicitation is unlawful.

United Kingdom

Each underwriter has represented and agreed that:

(1) 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 the FSMA) received by it in connection with the issue or sale of our common shares in circumstances in which Section 21(1) of the FSMA does not apply to us; and

(2) it has complied and will comply with all applicable provisions of the FSMA with respect to anything done by it in relation to our common shares in, from or otherwise involving the United Kingdom.

European Economic Area

In relation to each Member State of the European Economic Area which has implemented the Prospectus Directive (each, a "Relevant Member State"), an offer to the public of any shares which are the subject of the offering contemplated by this prospectus (the "Shares") may not be made in that Relevant Member State, except that an offer to the public in that Relevant Member State of any Shares may be made at any time under the following exemptions under the Prospectus Directive, if they have been implemented in that Relevant Member State:

(1) to any legal entity which is a qualified investor as defined in the Prospectus Directive;

(2) 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 Prospectus Directive), as permitted under the Prospectus Directive, subject to obtaining the prior consent of the representatives for any such offer; or

(3) in any other circumstances falling within Article 3(2) of the Prospectus Directive, provided that no such offer of Shares shall result in a requirement for the publication by us or any underwriter of a prospectus pursuant to Article 3 of the Prospectus Directive.

For the purposes of this provision, the expression an "offer to the public" in relation to any Shares 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 any Shares to be offered so as to enable an investor to decide to purchase any Shares, as the same may be varied in that Member State by any measure implementing the Prospectus Directive in that Member State, the expression "Prospectus Directive" means Directive 2003/71/EC (and amendments thereto,

including the 2010 PD Amending Directive, to the extent implemented in the Relevant Member State), and includes any relevant implementing measure in the Relevant Member State, and the expression "2010 PD Amending Directive" means Directive 2010/73/EU.

Switzerland

The shares may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange, or the SIX, or on any other stock exchange or regulated trading facility in Switzerland. This document has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this prospectus nor any other offering or marketing material relating to the shares or the offering may be publicly distributed or otherwise made publicly available in Switzerland.

Neither this prospectus nor any other offering or marketing material relating to the offering, the Company, the shares have been or will be filed with or approved by any Swiss regulatory authority. In particular, this document will not be filed with, and the offer of shares will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA, and the offer of shares has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes, or the CISA. The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of shares.

Hong Kong

The shares may not be offered or sold by means of any document other than (i) in circumstances which do not constitute an offer to the public within the meaning of the Companies Ordinance (Cap.32, Laws of Hong Kong), or (ii) to "professional investors" within the meaning of the Securities and Futures Ordinance (Cap.571, Laws of Hong Kong) and any rules made thereunder, or (iii) in other circumstances which do not result in the document being a "prospectus" within the meaning of the Companies Ordinance (Cap.32, Laws of Hong Kong), and no advertisement, invitation or document relating to the shares may be issued or may be in the possession of any person for the purpose of issue (in each case whether in Hong Kong or elsewhere), which is directed at, or the contents of which are likely to be accessed or read by, the public in Hong Kong (except if permitted to do so under the laws of Hong Kong) other than with respect to shares which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" within the meaning of the Securities and Futures Ordinance (Cap. 571, Laws of Hong Kong) and any rules made thereunder.

Singapore

This prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the shares may not be circulated or distributed, nor may the shares be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than (i) to an institutional investor under Section 274 of the Securities and Futures Act, Chapter 289 of Singapore (the "SFA"), (ii) to a relevant person, or any person pursuant to Section 275(1A), and in accordance with the conditions, specified in Section 275 of the SFA or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the shares are subscribed or purchased under Section 275 by a relevant person which is: (a) a corporation (which is not an accredited investor) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or (b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary is an accredited investor, shares, debentures and units of shares and debentures of that corporation or the beneficiaries' rights and interest in that trust shall not be transferable for 6 months after that corporation or that trust has acquired the shares under Section 275 except: (1) to an institutional investor under Section 274 of the SFA or to a relevant

person, or any person pursuant to Section 275(1A), and in accordance with the conditions, specified in Section 275 of the SFA; (2) where no consideration is given for the transfer; or (3) by operation of law.

Japan

The securities have not been and will not be registered under the Financial Instruments and Exchange Law of Japan (the Financial Instruments and Exchange Law) and each underwriter has agreed that it will not offer or sell any securities, directly or indirectly, in Japan or to, or for the benefit of, any resident of Japan (which term as used herein means any person resident in Japan, including any corporation or other entity organized under the laws of Japan), or to others for re-offering or resale, directly or indirectly, in Japan or to a resident of Japan, except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the Financial Instruments and Exchange Law and any other applicable laws, regulations and ministerial guidelines of Japan.

LEGAL MATTERS

The validity of the issuance of our common stock offered in this prospectus will be passed upon for us by Ropes & Gray LLP, San Francisco, California. Certain legal matters in connection with this offering will be passed upon for the underwriters by Latham & Watkins LLP, Costa Mesa, California.

EXPERTS

Ernst & Young LLP, independent registered public accounting firm, has audited our financial statements at December 31, 2011 and 2012, and for each of the two years in the period ended December 31, 2012, and for the period from April 22, 2010 (Inception) to December 31, 2012, as set forth in their report. We have included our financial statements in the prospectus and elsewhere in the registration statement in reliance on Ernst & Young LLP's report, given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-1, or the registration statement, under the Securities Act with respect to the shares of common stock offered hereby. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement or the exhibits and schedules filed therewith. For further information with respect to Ultragenyx Pharmaceutical Inc. and the common stock offered hereby, reference is made to the registration statement and the exhibits and schedules filed therewith. Statements contained in this prospectus regarding the contents of any contract or any other document that is filed as an exhibit to the registration statement are not necessarily complete, and each such statement is qualified in all respects by reference to the full text of such contract or other document filed as an exhibit to the registration statement. A copy of the registration statement and the exhibits and schedules filed therewith may be inspected without charge at the public reference room maintained by the SEC, located at 100 F Street N.E., Washington, D.C. 20549, and copies of all or any part of the registration statement may be obtained from such offices upon the payment of the fees prescribed by the SEC. Please call the SEC at 1-800-SEC-0330 for further information about the public reference room. The SEC also maintains a website that contains reports, proxy and information statements and other information regarding registrants that file electronically with the SEC. The address is www.sec.gov.

Upon completion of this offering, we will become subject to the information and periodic reporting requirements of the Exchange Act and, in accordance therewith, will file periodic reports, proxy statements and other information with the SEC. Such periodic reports, proxy statements and other information will be available for inspection and copying at the public reference room and website of the SEC referred to above. We maintain a website at *www.ultragenyx.com*. The reference to our website address does not constitute incorporation by reference of the information contained on our website, and you should not consider the contents of our website in making an investment decision with respect to our common stock.

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

Index to Financial Statements

Years Ended December 31, 2011 and 2012 and the Period From
April 22, 2010 (Inception) Through December 31, 2012

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of
Ultragenyx Pharmaceutical Inc.

We have audited the accompanying balance sheets of Ultragenyx Pharmaceutical Inc. (a development stage company) (the Company) as of December 31, 2011 and 2012, and the related statements of operations and comprehensive loss, convertible preferred stock and stockholders' deficit, and cash flows for each of the two years in the period ended December 31, 2012, and for the period from April 22, 2010 (Inception) through December 31, 2012. 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 Ultragenyx Pharmaceutical Inc. at December 31, 2011 and 2012, and the results of its operations and comprehensive loss and its cash flows for each of the two years in the period ended December 31, 2012 and for the period from April 22, 2010 (Inception) through December 31, 2012, in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP

Redwood City, California
October 3, 2013, except for the last paragraph of Note 2, as to which the date is January 17, 2014

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

BALANCE SHEETS
(In thousands, except share and per share amounts)

	December 31, 2011	December 31, 2012
Assets		
Current assets:		
Cash and cash equivalents	$10,645	$ 86,190
Receivables due from related party	103	—
Prepaid expenses and other current assets	205	255
Total current assets	10,953	86,445
Property and equipment, net	759	1,362
Restricted cash	376	476
Other assets	41	33
Total assets	$12,129	$ 88,316
Liabilities, Convertible Preferred Stock and Stockholders' Deficit		
Current liabilities:		
Accounts payable	$ 342	$ 1,200
Accrued liabilities	657	1,913
Deferred rent—current portion	—	75
Total current liabilities	999	3,188
Convertible preferred stock warrant liability	216	518
Other liabilities	271	270
Total liabilities	1,486	3,976
Commitments and contingencies (Note 6)		
Series A redeemable convertible preferred stock, par value of $0.001 per share—62,000,000 and 35,377,556 shares authorized as of December 31, 2011 and 2012; 18,052,464 and 34,349,894 shares issued and outstanding as of December 31, 2011 and 2012; redemption value of $47,159 as of December 31, 2012	18,604	37,458
Series B convertible preferred stock, par value of $0.001 per share—0 and 27,081,680 shares authorized as of December 31, 2011 and 2012; 0 and 27,081,680 shares issued and outstanding as of December 31, 2011 and 2012; aggregate liquidation preference of $75,060 as of December 31, 2012	—	73,929
Stockholders' deficit:		
Common stock, par value of $0.001 per share—85,000,000 shares authorized; 3,038,620 and 3,458,928 shares issued and outstanding as of December 31, 2011 and 2012	3	3
Additional paid-in capital	191	8
Deficit accumulated during the development stage	(8,155)	(27,058)
Total stockholders' deficit	(7,961)	(27,047)
Total liabilities, convertible preferred stock and stockholders' deficit	$12,129	$ 88,316

See accompanying notes.

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS
(In thousands, except share and per share amounts)

	Year Ended December 31,		Period from April 22, 2010 (Inception) Through December 31,
	2011	2012	2012
Operating expenses:			
Research and development	$ 4,717	$ 12,641	$ 18,316
General and administrative	1,844	3,344	5,480
Total operating expenses	6,561	15,985	23,796
Loss from operations	(6,561)	(15,985)	(23,796)
Other income (expense), net:			
Interest income	4	1	5
Interest expense	(270)	—	(318)
Other expense, net	(22)	(350)	(380)
Total other income (expense), net	(288)	(349)	(693)
Net loss and comprehensive loss	$ (6,849)	$ (16,334)	$ (24,489)
Net loss attributable to common stockholders	$ (7,466)	$ (19,561)	
Net loss per share attributable to common stockholders, basic and diluted	$ (4.62)	$ (14.20)	
Shares used in computing net loss per share attributable to common stockholders, basic and diluted	1,617,384	1,377,207	
Pro forma net loss per share attributable to common stockholders, basic and diluted (unaudited)		$ (2.02)	
Shares used in computing pro forma net loss per share attributable to common stockholders, basic and diluted (unaudited)		9,999,398	

See accompanying notes.

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

STATEMENTS OF CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' DEFICIT
(In thousands, except share and per share amounts)

	Convertible Preferred Stock				Stockholders' Deficit				
	Series A Redeemable Convertible Preferred Stock		Series B Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Deficit Accumulated During the Development Stage	Total Stockholders' Deficit
	Shares	Amount	Shares	Amount	Shares	Amount			
Balance as of April 22, 2010 (Inception)	—	$ —	—	$ —	—	$ —	$ —	$ —	$ —
Issuance of common stock for cash	—	—	—	—	2,628,808	3	(2)	—	1
Net loss and comprehensive loss	—	—	—	—	—	—	—	(1,306)	(1,306)
Balance as of December 31, 2010	—	—	—	—	2,628,808	3	(2)	(1,306)	(1,305)
Issuance of common stock for cash	—	—	—	—	409,812	—	—	—	—
Issuance of Series A redeemable convertible preferred stock for cash at $1.034 per share, net of $121 of issuance cost in June 2011	14,508,173	14,879	—	—	—	—	—	—	—
Issuance of Series A redeemable convertible preferred stock in exchange for conversion of promissory notes and accrued interest at $1.034 per share in June 2011	3,544,291	3,664	—	—	—	—	—	—	—
Stock-based compensation expense related to employee stock option grants	—	—	—	—	—	—	36	—	36
Stock-based compensation expense related to founder's stock	—	—	—	—	—	—	218	—	218
Accretion on convertible preferred stock	—	61	—	—	—	—	(61)	—	(61)
Net loss and comprehensive loss	—	—	—	—	—	—	—	(6,849)	(6,849)
Balance as of December 31, 2011	18,052,464	18,604	—	—	3,038,620	3	191	(8,155)	(7,961)
Issuance of common stock upon exercise of stock options	—	—	—	—	420,308	—	131	—	131
Issuance of Series A redeemable convertible preferred stock for cash at $1.034 per share, net of $20 of issuance cost in July 2012	14,604,895	15,080	—	—	—	—	—	—	—
Issuance of Series A redeemable convertible preferred stock in lieu of cash dividend	1,692,535	2,070	—	—	—	—	(1,205)	(865)	(2,070)
Issuance of Series B convertible preferred stock for cash at $2.77 per share, net of $1,071 of issuance cost in December 2012	—	—	27,081,680	73,929	—	—	—	—	—
Stock-based compensation expense related to employee stock option grants	—	—	—	—	—	—	178	—	178
Stock-based compensation expense related to founder's stock	—	—	—	—	—	—	713	—	713
Accretion on convertible preferred stock	—	1,704	—	—	—	—	—	(1,704)	(1,704)
Net loss and comprehensive loss	—	—	—	—	—	—	—	(16,334)	(16,334)
Balance as of December 31, 2012	34,349,894	$37,458	27,081,680	$73,929	3,458,928	$ 3	$ 8	$ (27,058)	$ (27,047)

See accompanying notes.

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

STATEMENTS OF CASH FLOWS
(In thousands)

	Year Ended December 31,		Period from April 22, 2010 (Inception) Through December 31, 2012
	2011	2012	
Operating activities:			
Net loss	$ (6,849)	$ (16,334)	$ (24,489)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	34	313	353
Noncash interest expense	270	—	318
Stock-based compensation	254	891	1,145
Revaluation of convertible preferred stock warrant liability	13	302	315
Changes in operating assets and liabilities:			
Receivable—related party	(3)	3	—
Prepaid expenses and other current assets	(205)	(50)	(255)
Other assets	(41)	8	(33)
Accounts payable	252	858	1,200
Accrued expenses and other liabilities	450	1,505	2,257
Net cash used in operating activities	(5,825)	(12,504)	(19,189)
Investing activities:			
Purchase of property and equipment	(548)	(1,091)	(1,715)
Increase in restricted cash	(376)	(100)	(476)
Net cash used in investing activities	(924)	(1,191)	(2,191)
Financing activities:			
Net proceeds from issuance of convertible preferred stock	14,879	89,009	103,888
Net proceeds from issuance of common stock	—	131	132
Proceeds from issuance of promissory notes	2,450	100	3,550
Net cash provided by financing activities	17,329	89,240	107,570
Net increase in cash and cash equivalents	10,580	75,545	86,190
Cash and cash equivalents at beginning of period	65	10,645	—
Cash and cash equivalents at end of period	$ 10,645	$ 86,190	$ 86,190
Supplemental disclosures of non-cash investing and financing information:			
Issuance of convertible preferred stock warrants	$ 157	$ —	$ 202
Issuance of Series A redeemable convertible preferred stock in lieu of cash dividend	$ —	$ 2,070	$ 2,070
Conversion of promissory notes into Series A redeemable convertible preferred stock	$ 3,550	$ —	$ 3,550
Conversion of interest accrued on promissory notes into Series A redeemable convertible preferred stock	$ 114	$ —	$ 114

See accompanying notes.

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

Notes to Financial Statements

1. Organization and Basis of Presentation

Ultragenyx Pharmaceutical Inc. (the Company) is a development stage biotechnology company and was incorporated in California on April 22, 2010. The Company subsequently reincorporated in the state of Delaware in June 2011.

The Company is focused on the identification, acquisition, development, and commercialization of novel products for the treatment of rare and ultra-rare diseases, with an initial focus on serious, debilitating metabolic genetic diseases. The Company is currently conducting a Phase 2 clinical trial of sialic acid, extended release (SA-ER) in patients with hereditary inclusion body myopathy (HIBM), a progressive muscle-wasting disorder. The Company is in the development stage as of December 31, 2012, as defined by Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 915, *Development Stage Entities*, and since Inception has been engaged in developing its product candidates, raising capital and recruiting personnel. The Company operates in one reportable segment in the United States of America.

In the course of its development activities, the Company has sustained operating losses and expects such losses to continue over the next several years. The Company's ultimate success depends on the outcome of its research and development activities. From April 22, 2010 (Inception) through December 31, 2012, the Company has incurred cumulative net losses of $24.5 million. Management expects to incur additional losses in the future to conduct product research and development and recognizes the need to raise additional capital to fully implement its business plan. The Company intends to raise such capital through the issuance of additional equity, and potentially through borrowings, and strategic alliances with partner companies. However, if such financing is not available at adequate levels, the Company will need to reevaluate its operating plans.

2. Summary of Significant Accounting Policies

Use of Estimates

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

Cash and Cash Equivalents

The Company considers all highly liquid investments with original maturities of three months or less from the date of purchase to be cash equivalents. Cash equivalents consist primarily of amounts invested in money market accounts.

Restricted Cash

Restricted cash consists of a money market account with one of the Company's financial institutions as collateral for its obligations under its facility lease of the Company's corporate headquarters in Novato, California. Additionally, restricted cash includes a savings account associated with a credit card agreement at one of the Company's financial institutions.

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

Notes to Financial Statements (continued)

2. Summary of Significant Accounting Policies (continued)

Concentration of Credit Risk

Financial instruments that potentially subject the Company to a concentration of credit risk consist of cash and cash equivalents. The Company's cash and cash equivalents are held by two financial institutions in the United States. Such deposits may exceed federally insured limits. Management believes that these financial institutions are financially sound, and, accordingly, minimal credit risk exists with respect to those financial institutions. The Company is exposed to credit risk in the event of default by the financial institutions holding its cash and cash equivalents to the extent recorded in the balance sheets.

Fair Value Measurement

Fair value accounting is applied for all financial assets and liabilities and non-financial assets and liabilities that are recognized or disclosed at fair value in the financial statements on a recurring basis (at least annually).

Property and Equipment

Property and equipment are stated at cost, less accumulated depreciation and amortization. Depreciation is computed using the straight-line method over the estimated useful lives of the respective assets. Depreciation begins at the time the asset is placed in service. Maintenance and repairs are charged to operations as incurred. Upon sale or retirement of assets, the cost and related accumulated depreciation are removed from the balance sheet and the resulting gain or loss, if any, is reflected in operations.

The useful lives of the property and equipment are as follows:

Research and development equipment	5 years
Furniture and office equipment	5 years
Computer equipment	3 years
Software	3 years
Leasehold improvements	Shorter of lease term or estimated useful life

Impairment of Long-Lived Assets

The Company evaluates its long-lived assets, including property and equipment, for impairment whenever events or changes in circumstances indicate that the carrying value of these assets may not be recoverable. Recoverability of these assets is measured by comparison of the carrying amount of each asset to the future undiscounted cash flows expected to result from the use of the asset and its eventual disposition. If the asset is considered to be impaired, the amount of any impairment is measured as the difference between the carrying value and the fair value of the impaired asset. The Company has not recorded impairment of any long-lived assets since inception.

Accruals of Research and Development Costs

The Company records accruals for estimated costs of research, preclinical and clinical studies and manufacturing development. These costs are a significant component of the Company's research and development expenses. A substantial portion of the Company's ongoing research and development activities are conducted by third-party service providers, including contract research organizations. The Company accrues the costs incurred under its agreements with these third parties based on actual work completed in accordance with

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

Notes to Financial Statements (continued)

2. Summary of Significant Accounting Policies (continued)

agreements established with these third parties. The Company determines the actual costs through discussions with internal personnel and external service providers as to the progress or stage of completion of the services and the agreed-upon fee to be paid for such services. The Company makes significant judgments and estimates in determining the accrual balance in each reporting period. As actual costs become known, the Company adjusts its accruals. The Company has not experienced any material deviations between accrued clinical trial expenses and actual clinical trial expenses. However, actual services performed, number of patients enrolled, and the rate of patient enrollment may vary from the Company's estimates, resulting in adjustments to clinical trial expense in future periods. Changes in these estimates that result in material changes to the Company's accruals could materially affect the Company's results of operations.

Leases

The Company enters into lease agreements for its office and laboratory facilities. These leases are classified as operating leases. Rent expense is recognized on a straight-line basis over the term of the lease and, accordingly, the Company records the difference between cash rent payments and the recognition of rent expense as a deferred rent liability. Incentives granted under the Company's facilities leases, including allowances to fund leasehold improvements, are deferred and are recognized as adjustments to rental expense on a straight-line basis over the term of the lease.

Convertible Preferred Stock

The Company initially records all shares of convertible preferred stock net of offering costs on the dates of issuance, which represents the carrying value. At any time after June 16, 2017, but within sixty (60) days after the receipt by the Company of a written request from the holders of not less than seventy-five percent (75%) of the then outstanding Series A convertible preferred stock, all shares of Series A convertible preferred stock can be redeemed. As only the passage of time is required for Series A convertible preferred stock to become redeemable, the Company is accreting the carrying value of Series A convertible preferred stock to its redemption value over the period from the date of issuance to June 16, 2017 (the earliest redemption date). In the event of a change of control of the Company, proceeds will be distributed in accordance with the liquidation preferences set forth in its Amended and Restated Certificate of Incorporation unless the holders of convertible preferred stock have converted their convertible preferred shares into common shares. Therefore, convertible preferred stock is classified outside of stockholders' deficit on the accompanying balance sheets, as Series A convertible preferred stock can be redeemed and as events triggering the liquidation preferences are not solely within the Company's control.

Convertible Preferred Stock Warrant Liability

Warrants for shares that are either puttable or that are contingently redeemable are classified as liabilities on the balance sheets. The warrants are subject to remeasurement at each balance sheet date, with changes in fair value recognized as a component of interest and other expense. The Company will continue to adjust the liability for changes in fair value until the earlier of the expiration of the warrants, exercise of the warrants, or conversion of the warrants upon the completion of a liquidation event, including the completion of an initial public offering to common stock warrants that will no longer be subject to remeasurement.

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

Notes to Financial Statements (continued)

2. Summary of Significant Accounting Policies (continued)

Research and Development

Research and development costs are expensed as incurred and consist of salaries and benefits, stock-based compensation expense, lab supplies and facility costs, as well as fees paid to other nonemployees and entities that conduct certain research and development activities on the Company's behalf. Amounts incurred in connection with license agreements are also included in research and development expense. Nonrefundable advance payments for goods or services to be received in the future for use in research and development activities are deferred and capitalized. The capitalized amounts are expensed as the related goods are delivered or the services are performed.

Stock-Based Compensation

Stock-based awards issued to employees, including stock options, are recorded at fair value as of the grant date using the Black-Scholes option-pricing model and recognized as expense on a straight-line basis over the employee's requisite service period (generally the vesting period). Because noncash stock compensation expense is based on awards ultimately expected to vest, it is reduced by an estimate for future forfeitures. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from estimates.

Income Taxes

The Company uses the liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial reporting and the tax bases of assets and liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. The Company must then assess the likelihood that the resulting deferred tax assets will be realized. A valuation allowance is provided when it is more likely than not that some portion or all of a deferred tax asset will not be realized. Due to the Company's lack of earnings history, the net deferred tax assets have been fully offset by a valuation allowance.

The Company recognizes benefits of uncertain tax positions if it is more likely than not that such positions will be sustained upon examination based solely on their technical merits, as the largest amount of benefit that is more likely than not to be realized upon the ultimate settlement. The Company's policy is to recognize interest and penalties related to the underpayment of income taxes as a component of income tax expense or benefit. To date, there have been no interest or penalties charged in relation to the unrecognized tax benefits.

Net Loss per Share Attributable to Common Stockholders

Basic net loss per share attributable to common stockholders is calculated by dividing the net loss attributable to common stockholders by the weighted average number of shares of common stock outstanding during the period, without consideration for common stock equivalents. The net loss attributable to common stockholders is calculated by adjusting the net loss of the Company for the accretion on the Series A convertible preferred stock and cumulative dividends on Series A and B convertible preferred stock. Diluted net loss per share attributable to common stockholders is the same as basic net loss per share attributable to common stockholders, since the effects of potentially dilutive securities are antidilutive.

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Financial Statements (continued)

2. Summary of Significant Accounting Policies (continued)

Unaudited Pro Forma Net Loss per Share Attributable to Common Stockholders

Pro forma basic and diluted net loss per share attributable to common stockholders has been computed to give effect to the conversion of the convertible preferred stock into common stock in connection with the Company's initial public offering. Also, the numerator in the pro forma basic and diluted net loss per share attributable to common stockholders calculation has been adjusted to remove gains and losses resulting from remeasurement of the convertible preferred stock warrant liability as these amounts will be reclassified to additional paid-in capital upon a qualifying initial public offering of the Company's common stock and has also been adjusted to reflect the payment of a dividend to the Company's convertible preferred stockholders concurrent with the conversion of the Company's convertible preferred stock to common stock immediately prior to the completion of this offering. The denominator in the pro forma basic and diluted net loss per share attributable to common stockholders has been adjusted to give effect to the number of shares that would be required to be issued at an assumed public offering price of $15.50 per share to pay the dividend to the convertible preferred stockholders. The pro forma net loss per share attributable to common stockholders does not include the shares expected to be sold and related proceeds to be received from the initial public offering.

Recent Accounting Pronouncements

In February 2013, the FASB issued Accounting Standards Update (ASU) No. 2013-02, *Other Comprehensive Income (Topic 220): Reporting of Amounts Reclassified Out of Accumulated Other Comprehensive Income*. ASU No. 2013-02 supersedes the presentation requirements for reclassifications out of accumulated other comprehensive income in ASU 2011-05 and 2011-12 and requires an entity to provide additional information about reclassifications out of accumulated other comprehensive income. The amendment is effective in fiscal years beginning after December 15, 2012. The adoption of this amendment will not have a material impact on the Company's results of operations or financial position.

Reverse Stock Split

In January 2014, the Company's board of directors and its stockholders approved an amendment to the Company's amended and restated certificate of incorporation to effect a reverse split of shares of our common stock on a 1-for-3.1345 basis (the "Reverse Stock Split"). The par values and the authorized shares of the common and convertible preferred stock were not adjusted as a result of the Reverse Stock Split, nor were the outstanding shares of preferred stock. All issued and outstanding common stock and related per share amounts contained in the financial statements have been retroactively adjusted to reflect this Reverse Stock Split for all periods presented. A proportional adjustment to the conversion ratio for each series of convertible preferred stock was also effected in connection with the reverse split. The Reverse Stock Split was effected on January 17, 2014.

3. Fair Value Measurements

Financial assets and liabilities are recorded at fair value. The carrying amount of certain financial instruments, including cash and cash equivalents, accounts payable and accrued liabilities approximate fair value due to their relatively short maturities. Assets and liabilities recorded at fair value on a recurring basis in the balance sheets are categorized based upon the level of judgment associated with the inputs used to measure their fair values. Fair value is defined as the exchange price that would be received for an asset or an exit price that would be paid to transfer a liability in the principal or most advantageous market for the asset or liability in an

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Financial Statements (continued)

3. Fair Value Measurements (continued)

orderly transaction between market participants on the measurement date. The authoritative guidance on fair value measurements establishes a three-tier fair value hierarchy for disclosure of fair value measurements as follows:

Level 1—Inputs are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date;

Level 2—Inputs are observable, unadjusted quoted prices in active markets for similar assets or liabilities, unadjusted quoted prices for identical or similar assets or liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the related assets or liabilities; and

Level 3—Unobservable inputs that are significant to the measurement of the fair value of the assets or liabilities that are supported by little or no market data.

The Company's financial instruments consist of Level 1 assets and Level 3 liabilities. Where quoted prices are available in an active market, securities are classified as Level 1. Level 1 assets consist primarily of highly liquid money market funds that are included in restricted cash.

In certain cases where there is limited activity or less transparency around inputs to valuation, securities are classified as Level 3. Level 3 liabilities consist of the convertible preferred stock warrant liability. The following table sets forth the fair value of the Company's financial assets and liabilities remeasured on a recurring basis based on the three-tier fair value hierarchy (in thousands):

	December 31, 2011			
	Level 1	Level 2	Level 3	Total
Financial Assets:				
Money market funds	$ 376	$ —	$ —	$376
Total financial assets	$ 376	$ —	$ —	$376
Financial Liabilities:				
Convertible preferred stock warrant liability	$ —	$ —	$ 216	$216
Total financial liabilities	$ —	$ —	$ 216	$216

	December 31, 2012			
	Level 1	Level 2	Level 3	Total
Financial Assets:				
Money market funds	$ 376	$ —	$ —	$376
Total financial assets	$ 376	$ —	$ —	$376
Financial Liabilities:				
Convertible preferred stock warrant liability	$ —	$ —	$ 518	$518
Total financial liabilities	$ —	$ —	$ 518	$518

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Notes to Financial Statements (continued)

3. Fair Value Measurements (continued)

The following table sets forth a summary of the changes in the fair value of the Company's Level 3 financial liabilities (in thousands):

	Year Ended December 31,	
	2011	2012
Fair value, beginning of period	$ 46	$ 216
Issuance of preferred stock warrants	157	—
Change in fair value recorded as a loss in other expense, net	13	302
Fair value, end of period	$ 216	$ 518

The determination of the fair value of the convertible preferred stock warrants is discussed in Note 9. Generally, increases or decreases in the fair value of the underlying convertible preferred stock would result in a directionally similar impact in the fair value measurement of the warrant liability.

4. Balance Sheet Components

Property and Equipment, net

Property and equipment, net consists of the following (in thousands):

	December 31,	
	2011	2012
Research and development equipment	$128	$ 225
Furniture and office equipment	80	266
Computer equipment	52	187
Software	10	34
Leasehold improvements	529	1,003
Property and equipment, gross	799	1,715
Less accumulated depreciation and amortization	(40)	(353)
Property and equipment, net	$759	$1,362

Depreciation and amortization expense for the years ended December 31, 2011 and 2012 and the period from April 22, 2010 (Inception) through December 31, 2012 was $34,000, $313,000 and $353,000, respectively.

Accrued Liabilities

Accrued liabilities consist of the following (in thousands):

	December 31,	
	2011	2012
Research and clinical trial expenses	$147	$ 595
Payroll and related expenses	419	1,289
Other	91	29
Total accrued liabilities	$657	$1,913

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Financial Statements (continued)

5. Convertible Promissory Notes

In June 2010, the Company entered into a convertible promissory note and warrant purchase agreement with its Chief Executive Officer and Founder, Emil Kakkis, M.D., PhD, in which it could borrow up to $1,000,000 from Dr. Kakkis at an interest rate of 8% per annum. During 2010, the Company borrowed the entire amount of $1,000,000 available under the agreement. The note also contained a provision under which all outstanding principal and accrued interest would automatically be converted into preferred stock upon a financing event in which the Company issued newly authorized shares of preferred stock for aggregate proceeds of not less than $500,000. Under the terms of the agreement, the note automatically converted at the same terms and conditions of the financing. Pursuant to the agreement, the Company also issued a warrant to purchase shares of Series A convertible preferred stock (see Note 9). From July 2010 to June 2011, the Company entered into two additional convertible promissory note and warrant purchase agreements with Dr. Kakkis in which it borrowed an additional $800,000 under similar terms and issued additional warrants. In June 2011, the outstanding principal balance of $1,800,000 from all three notes plus accrued interest was converted into shares of Series A convertible preferred stock at the same issuance price per share of $1.034 as all other purchasers of Series A convertible preferred stock. The number of shares underlying the warrant to be issued was dependent on the aggregate amount owing at the time of the initial closing of the Series A convertible preferred stock financing and the price per share of the Series A convertible preferred stock. Based on the formula specified in the Warrant Agreement, warrants to purchase an aggregate of 435,245 shares of Series A convertible preferred stock at an exercise price of $1.034 were issued to Dr. Kakkis upon the initial closing in June 2011.

In February 2011, the Company entered into two note and warrant purchase agreements with two related parties in which it borrowed a total of $1,750,000 at an interest rate of 8% per annum. The notes and all accrued interest were fully due and payable on the one-year anniversary date of each respective note agreement. The notes also contained a provision under which all outstanding principal and accrued interest would automatically be converted into preferred stock upon a financing event in which the Company issued newly authorized shares of preferred stock for aggregate proceeds of not less than $500,000. Under the terms of the agreement, the notes automatically converted at the same terms and conditions of the financing. In June 2011, the outstanding principal balance of $1,750,000 plus accrued interest from the two notes was converted into shares of Series A convertible preferred stock at the same issuance price per share of $1.034 paid by all other purchasers of Series A convertible preferred stock. Pursuant to the agreement, the Company issued a warrant to purchase shares of Series A convertible preferred stock (see Note 9). The number of shares underlying the warrant to be issued was dependent on the aggregate amount of principal outstanding at the time of the initial closing of the Series A convertible preferred stock financing, subsequently completed in June 2011, and the price per share of the Series A convertible preferred stock. Based on the formula specified in the Warrant Agreements, warrants to purchase an aggregate of 592,417 shares of Series A convertible preferred stock at an exercise price of $1.034 were issued to the two note holders upon the closing of the financing in June 2011.

6. Commitments and Contingencies

Facilities

From inception until March of 2012, the Company rented office space in a building under an informal monthly agreement. The Company’s founder also rented space for one of his other business interests in that same building.

In July 2011, the Company entered into a lease agreement for office facilities in Novato, California, which provided for a tenant improvement allowance of up to $376,000. The lease commenced in March of 2012. This noncancelable operating lease expires five years after the commencement date. At the end of the lease term, the

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Notes to Financial Statements (continued)

6. Commitments and Contingencies (continued)

Company has the option to extend the lease for two additional consecutive terms of five years. The Company also signed an addendum to the lease agreement in July 2011 to add warehouse space to the arrangement.

In September 2010, the Company entered into a license and service agreement for a lab facility in Novato, California. The term commenced in September 2010. This agreement expires two years after the commencement date, and either party may terminate the agreement with one year's prior notice without cause and purely out of convenience of such party. In September 2012, the Company entered into an amendment to increase the size of the lab facility and extend the term. This amendment expires two years after the amendment date, and either party may terminate the agreement with one year's prior notice without cause.

As of December 31, 2012, the aggregate future minimum lease payments under the noncancelable operating lease arrangements are as follows (in thousands):

Year Ending December 31:	
2013	$ 345
2014	285
2015	285
2016	285
2017	47
	$1,247

The Company recognizes rent expense on a straight-line basis over the noncancelable term of its operating lease. Rent expense was $84,000, $265,000 and $367,000 during the years ended December 31, 2011 and 2012 and the period from April 22, 2010 (Inception) through December 31, 2012, respectively.

Under the terms of the lease agreement of its Novato office facility, the Company provided the lessor with an irrevocable letter of credit in the amount of $376,000. The lessor shall be entitled to draw on the letter of credit in the event of any uncured default by the Company under the terms of the lease. Provided there has been no default on the lease, the Company may reduce the amount of the letter of credit by $75,000 on each anniversary date from the commencement date.

Other Commitments

The Company has various manufacturing, clinical, research, and other contracts with vendors in the conduct of the normal course of its business. All contracts are terminable, with varying provisions regarding termination. If a contract with a specific vendor were to be terminated, the Company would only be obligated for the products or services that the Company had received at the time the termination became effective.

Contingencies

While there are no legal proceedings the Company is aware of, the Company may become party to various claims and complaints arising in the ordinary course of business. Management does not believe that any ultimate liability resulting from any of these claims will have a material adverse effect on its results of operations, financial position, or liquidity. However, management cannot give any assurance regarding the ultimate outcome of these claims, and their resolution could be material to operating results for any particular period, depending upon the level of income for the period.

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Financial Statements (continued)

6. Commitments and Contingencies (continued)

Guarantees and Indemnifications

The Company indemnifies each of its directors for certain events or occurrences, subject to certain limits, while the director is or was serving at the Company's request in such capacity, as permitted under Delaware law and in accordance with its certificate of incorporation and bylaws. The term of the indemnification period lasts as long as a director may be subject to any proceeding arising out of acts or omissions of such director in such capacity. The maximum amount of potential future indemnification is unlimited; however, the Company currently holds director liability insurance. This insurance allows the transfer of risk associated with the Company's exposure and may enable it to recover a portion of any future amounts paid. The Company believes that the fair value of these indemnification obligations is minimal. Accordingly, it has not recognized any liabilities relating to these obligations for any period presented.

7. License and Research Agreements

Nobelpharma License Agreement

In September 2010, the Company entered into a collaboration and license agreement with Nobelpharma Co., Ltd. (Nobelpharma). Under the terms of this collaboration and license agreement, each party granted the other party a worldwide exclusive license under certain of that party's intellectual property related to the compound identified as N-acetylneuraminic acid, also known as sialic acid, to develop, manufacture, and commercialize products. Nobelpharma's licensed territory includes Japan and certain other Asian countries, and the Company's licensed territory includes the rest of the world.

Under the collaboration and license agreement, the Company paid Nobelpharma $110,500 (10 million Yen) for the license, which was recorded as research and development expense in 2010, and also issued 76,567 shares of common stock to Nobelpharma with a minimal value. The Company is required to pay Nobelpharma annual royalties and earned royalties based on net sales upon product sales commencement. In addition, the Company is required to make certain payments to Nobelpharma based upon achievement of certain development and approval milestones. The Company paid $495,000 in development milestone payments from inception through December 31, 2012. The remaining total aggregate payments, if all milestones are achieved by Nobelpharma, would be 200 million Yen (approximately $2.3 million based on the exchange rate at December 31, 2012). The Company will pay a high single digit royalty on net sales in the Company's territory and will receive a mid-single digit royalty on net sales in the Nobelpharma territory, excluding Japan, if such product sales are ever achieved. Net sales, as defined in the collaboration and license agreement, represent the net sales of products whereby the licensed compound is the active ingredient. If the products include other active ingredients, the portion of the net sales allocated to the licensed compound would be used in determining the royalty payments.

Saint Louis University License Agreement

In November 2010, the Company entered into a license agreement with Saint Louis University (SLU). Under the terms of this license agreement, SLU granted the Company an exclusive worldwide license to make, have made, use, import, offer for sale, and sell therapeutics related to SLU's beta-glucuronidase product for use in the treatment of human diseases.

Under the license agreement, the Company paid SLU an up-front fee of $10,000, which was recorded as research and development expense in 2010. The Company will be required to make a milestone payment of $100,000 upon approval of a glucuronidase-based enzyme therapy for treatment of MPS 7. Additionally, upon

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Notes to Financial Statements (continued)

7. License and Research Agreements (continued)

reaching a certain level of cumulative worldwide sales of the product, the Company will be required to pay to SLU a low single-digit royalty on net sales of the licensed products in any country or region, if such product sales are ever achieved.

AAI Pharma License Agreement

In March 2011, the Company entered into a license agreement with AAI Pharma Services Corp. (AAI Pharma). Under the terms of this license agreement, AAI Pharma granted the Company a fully paid-up, royalty-free, exclusive, perpetual, and irrevocable license to research, develop, make, have made, use, import, offer for sale, and sell products incorporating AAI Pharma's controlled release matrix solid dose oral tablet. Under the license agreement, the Company will pay a mid-single digit percentage of any sublicense revenue received by Ultragenyx related to the sublicense of AAI Pharma technology that had been initially licensed by Ultragenyx.

HIBM Research Group

License Agreement

In April 2012, the Company entered into an exclusive license agreement with HIBM Research Group (HRG). Under the terms of this license agreement, HRG granted the Company an exclusive worldwide license to certain intellectual property related to the treatment of HIBM.

Under the license agreement, the Company paid HRG an up-front fee of $25,000, which was recorded as research and development expense during the year ended December 31, 2012. The Company may make future payments that aggregate up to $300,000 and that are contingent upon attainment of various development and approval milestones. Additionally, the Company will pay to HRG a royalty of less than 1% of net sales of the licensed products in the licensed territories, if such product sales are ever achieved.

Research Agreement

In April 2012, the Company entered into a research agreement with HRG. Under the terms of this research agreement, the Company will engage HRG to perform certain nonclinical research activities related to the treatment for HIBM.

Under the research agreement, the Company was required to pay HRG an annual grant of $25,000 during the first five years from the effective date of the agreement. The agreement was terminated in 2013, and accordingly, no further amounts will be paid to HRG for research.

St. Jude Children's Research Hospital License Agreement

In September 2012, the Company entered into a license agreement with St. Jude Children's Research Hospital (St. Jude). Under the terms of this license agreement, St. Jude granted the Company an exclusive license under certain know-how to research, develop, make, use, offer to sell, import, and otherwise commercialize and exploit St. Jude's protective protein, cathepsin, a protein product to treat, prevent, and/or diagnose galactosialidosis and other monogenetic diseases.

Under the license agreement, the Company paid St. Jude an up-front fee of $10,000 which was recorded as research and development expense during the year ended December 31, 2012. Additionally, the Company will pay to St. Jude a royalty of less than 1% on net sales of the licensed products in the licensed territories, if such product sales are ever achieved.

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Financial Statements (continued)

7. License and Research Agreements (continued)

Baylor Research Institute License Agreement

In September 2012, the Company entered into a license agreement with Baylor Research Institute (BRI). Under the terms of this license agreement, BRI exclusively licensed to the Company certain intellectual property related to triheptanoin for North America.

Under the license agreement, the Company paid BRI an up-front fee of $250,000 which was recorded as research and development expense during the year ended December 31, 2012. The Company may make future payments of up to $10.5 million contingent upon attainment of various development milestones and $7.5 million contingent upon attainment of various sales milestones. Additionally, the Company will pay to BRI a mid-single digit royalty on net sales of the licensed product in the licensed territories.

The Company has an exclusive option to expand the licensed territory to a worldwide license if the previous holder of such territorial rights allows that option to lapse. The previous holder's option lapsed on December 31, 2012, and on June 26, 2013, the Company notified BRI that it was exercising its exclusive option to expand the licensed territory. The fee associated with this option exercise is $750,000 — See Note 15- Subsequent Events.

8. Related Party Transactions

Emil Kakkis, M.D., Ph.D., Founder, member of the Company's Board of Directors, President, and Chief Executive Officer, entered into a Note and Warrant Purchase Agreement with the Company whereby Dr. Kakkis loaned the Company a total of $1,800,000. In June 2011, the outstanding principal balance of $1,800,000 and all accrued interest was converted into Series A convertible preferred stock at the same issuance price of $1.034 paid by all other purchasers of Series A convertible preferred stock. As per the Note and Warrant Purchase Agreement, the Company issued Dr. Kakkis a warrant to purchase 435,245 shares of Series A convertible preferred stock with an exercise price of $1.034 per share.

William Aliski, a member of the Company's Board of Directors, entered into a Note and Warrant Purchase Agreement with the Company whereby Mr. Aliski loaned the Company $250,000 in February 2011. In June 2011, the outstanding principal balance of $250,000 and all accrued interest was converted into shares of Series A convertible preferred stock at the same issuance price of $1.034 paid by all other purchasers of Series A convertible preferred stock. As per the Note and Warrant Purchase Agreement, the Company issued Mr. Aliski a warrant to purchase 84,631 shares of Series A convertible preferred stock with an exercise price of $1.034 per share.

John Klock, a former member and current observer of the Company's Board of Directors, entered into a Note and Warrant Purchase Agreement with the Company whereby Mr. Klock loaned the Company $1,500,000 in February 2011. In June 2011, the outstanding principal balance of $1,500,000 and all accrued interest was converted into shares of Series A convertible preferred stock at the same issuance price of $1.034 paid by all other purchasers of Series A convertible preferred stock. As per the Note and Warrant Purchase Agreement, the Company issued Mr. Klock a warrant to purchase 507,786 shares of Series A convertible preferred stock with an exercise price of $1.034 per share.

From the inception of the Company to March 2012, the Company rented its office facility in Novato, California, from an entity affiliated with Dr. Kakkis. Rent expense under this arrangement was $92,000 for the period from April 22, 2010 (Inception) through December 31, 2012.

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Financial Statements (continued)

9. Convertible Preferred Stock Warrants

In connection with the terms of various promissory notes issued by the Company from June 2010 through February 2011, the Company issued warrants in which the number of shares and exercise price were subject to the per share price offered in the Series A convertible preferred stock sale. In June 2011, in connection with its closing of the first round of Series A convertible preferred stock financing, the Company determined that the warrants were convertible to 1,027,662 shares of Series A convertible preferred stock at an exercise price of $1.034 per share. The warrants expire on the earlier of (i) change of control of the Company or any simultaneous sale of more than a majority of the then-outstanding securities of the Company other than a mere reincorporation transaction or (ii) the ten year anniversary of their issue date. The Company determined the fair value of the warrants using an option-pricing method to allocate the equity value of the Company to the warrants based on the Company's capital structure. The equity value was estimated using the Back-Solve method, whereby the equity value was derived from a recent transaction involving the Company's own securities. The fair value ascribed to these warrants upon their issuance was $203,000. The fair value of the warrants was recorded as debt issuance costs and was amortized to interest expense using the effective-interest-rate method over the loan term. In connection with the conversion of the promissory notes into shares of Series A convertible preferred stock in June 2011, the Company recognized all remaining unamortized debt issuance costs.

As of December 31, 2011 and 2012, outstanding warrants consisted of the following:

Convertible Preferred Stock Warrants:	Number of Warrants	Date Issued	Term	Exercise Price
Series A	241,803	June 2010	10 years	$ 1.034
Series A	592,417	February 2011	10 years	1.034
Series A	193,442	June 2011	10 years	1.034
Total convertible preferred stock warrants	1,027,662			

The fair value of the warrants was estimated to be $216,000 and $518,000 as of December 31, 2011 and 2012, respectively. The key assumptions in the option-pricing valuation method as of December 31, 2011 and 2012 are as follows:

	December 31,	
	2011	2012
Value of Company equity	$23.5 million	$145.8 million
Expected volatility	80.0%	75.0%
Expected time to liquidity event	3.0 years	2.0 years
Risk-free interest rate	0.36%	0.25%

The Company recorded $13,000, $302,000 and $315,000 to other expense for the years ended December 31, 2011 and 2012 and for the period from April 22, 2010 (Inception) through December 31, 2012, respectively, representing the change in fair value of the warrants between the issuance date and the end of the reporting period.

10. Common Stock

The Company has reserved sufficient shares of common stock for issuance upon conversion of convertible preferred stock, exercise of stock options, and exercise of warrants. Common stockholders are entitled to dividends if and when declared by the Board of Directors subject to the prior rights of the preferred stockholders. As of December 31, 2012, no common stock dividends had been declared by the Board of Directors.

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Notes to Financial Statements (continued)

10. Common Stock (continued)

The Company had reserved shares of common stock, on an as-converted basis, for future issuance as follows:

	December 31, 2011	December 31, 2012
Convertible preferred stock	5,759,277	19,598,486
Convertible preferred stock warrants	327,853	327,853
2011 equity incentive plan	1,451,580	1,520,967
Shares available for future stock option grants	927,104	1,815,245
	8,465,814	23,262,551

11. Convertible Preferred Stock

Under the Company's Amended and Restated Certificate of Incorporation, as amended, the Company is authorized to issue two classes of shares: preferred and common stock. The preferred stock is issuable in series, and the Company's board of directors is authorized to determine the rights, preferences and terms of each series. As of December 31, 2011 and 2012, convertible preferred stock consisted of the following (in thousands, except share and per share amounts):

	As of December 31, 2011			
Convertible Preferred Stock:	Shares Authorized	Shares Issued and Outstanding	Proceeds Net of Issuance Costs	Aggregate Liquidation Preference
			(In thousands)	
Series A	62,000,000	18,052,464	$ 18,543	$ 19,272

	As of December 31, 2012			
Convertible Preferred Stock:	Shares Authorized	Shares Issued and Outstanding	Proceeds Net of Issuance Costs	Aggregate Liquidation Preference
			(In thousands)	
Series A	35,377,556	34,349,894	$ 33,623	$ 35,613
Series B	27,081,680	27,081,680	73,929	75,060
Total convertible preferred stock	62,459,236	61,431,574	$ 107,552	$ 110,673

The liquidation preference consists of the liquidation preference on the outstanding shares of the convertible preferred stock and the dividends in arrears on such shares in the amount of $607,000 and $159,000 as of December 31, 2011 and 2012.

Significant provisions of the convertible preferred stock are as follows:

Dividends—When and as declared by the Company's Board of Directors, the holders of the Series A convertible preferred stock (Series A) and the Series B convertible preferred stock (Series B), collectively referred to as "Preferred Stock," are entitled to receive dividends, out of any assets legally available therefor, prior and in preference to the declaration or payment of any dividend on the common stock or other securities and rights convertible of the Company, at the rate of $0.062 per share per annum, payable in the form of cash or property or, upon conversion of the preferred stock to common stock, payable in cash. Prior to the issuance of the Series B convertible preferred stock in December 2012, the Company was able to pay dividends in cash or additional shares of Series A convertible preferred stock. Such dividends shall accrue

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

Notes to Financial Statements (continued)

11. Convertible Preferred Stock (continued)

on each share from the date of issuance of such share, and shall accrue from day to day, whether or not earned or declared, and whether or not there are profits, surplus, shares, or other funds legally available for the payment of such dividends. Such dividends shall be cumulative so that, except as provided below, if such dividends in respect of any previous or current annual dividend period, at the annual rate specified above, shall not have been paid, the deficiency shall first be fully paid before any dividend or other distribution shall be paid on or declared and set apart for the common stock. Any accumulation of dividends on the Preferred Stock shall not bear interest. Cumulative dividends with respect to a share of Preferred Stock that are accrued, payable, and/or in arrears shall, upon conversion of such share to common stock, be paid to the extent assets are legally available therefor, and any amounts for which assets are not legally available shall be paid promptly as assets become legally available therefor. Any partial payment shall be made ratably among the holders of Preferred Stock in proportion to the payment each such holder would receive if the full amount of such dividends were paid. After dividends have been paid to the holders of the preferred stock, any additional dividends shall be paid among the holders of the preferred stock and common stock then outstanding in proportion to the greatest whole number of shares of common stock held (assuming conversion of Preferred Stock).

During 2012, $2,070,000 of preferred stock dividends were declared and paid to holders of Series A convertible preferred stock in the form of additional shares of Series A convertible preferred stock. Dividends in arrears as of December 31, 2011 and 2012 totaled $607,000 and $159,000, respectively, for both series of preferred stock.

Liquidation—In the event of any liquidation, dissolution, or winding up of the Company, either voluntary or involuntary, the holders of Series A and Series B shall be entitled to receive, on a pari passu basis, prior and in preference to any distribution of any of the assets of this Corporation to the holders of common stock by reason of their ownership thereof, an amount per share equal to the sum of $1.034 (the Original Series A Issue Price) for each outstanding share of Series A convertible preferred stock (subject to adjustment for recapitalizations) and $2.769 (the Original Series B Issue Price) for each outstanding share of Series B convertible preferred stock (subject to adjustment for recapitalizations) and an amount equal to all declared or accrued but unpaid dividends on such shares. If available assets are insufficient to pay the full liquidation preference, the available assets will be distributed ratably among the holders of preferred stock. If there are excess assets to be allocated upon liquidation beyond what is described above, holders of preferred stock and common stock will share in such assets on an as-converted basis. However, the holders of Series A shall not be entitled to further participate in any distribution of the remaining assets of the corporation following the receipt of aggregate distributions equal to $3.102, plus any declared or accrued but unpaid dividends, and the holders of Series B shall not be entitled to further participate in any distribution of the remaining assets of the corporation following the receipt of aggregate distributions equal to $8.308, plus any declared or accrued but unpaid dividends.

Redemption—At any time after June 16, 2017, but within 60 days after the receipt by this Corporation of a written request from the holders of not less than 75% of the then outstanding shares of Series A convertible preferred stock that all shares of Series A be redeemed, the Company shall, to the extent it may lawfully do so, redeem (the payment date being referred to herein as a Series A Redemption Date) all of the then-outstanding shares of Series A by paying in cash in exchange for the shares of Series A to be redeemed a sum equal to the greater of (i) the original Series A issue price per share of Series A (subject to adjustment for any recapitalizations) plus all declared or accrued but unpaid dividends on such shares and (ii) the then-current fair market value per share of Series A plus all declared or accrued but unpaid dividends on such shares (but only if, and to the extent, such dividends are not reflected in the fair market value) as determined

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Financial Statements (continued)

11. Convertible Preferred Stock (continued)

in good faith by the Board of Directors of the Company, and taking into account any independent third-party valuation reasonably requested by the holders of at least 75% of the Series A then outstanding; however, any holder of Series A may elect, by delivery of notice to the Company at least five days prior to the Series A redemption date, not to have such holder's shares of Series A preferred stock redeemed. As only the passage of time is required for Series A to become redeemable, the Company is accreting the carrying value of Series A to its redemption value over the period from the date of issuance to June 16, 2017 (the earliest redemption date) using the interest method.

The Series B convertible preferred stock is not redeemable.

Voting—Each holder of shares of preferred stock shall be entitled to the number of votes equal to the number of shares of common stock into which such shares of Preferred Stock could be converted and shall have voting rights and powers equal to the voting rights and powers of the common stock, and shall vote together with the common stock as a single class on an as- converted basis on all matters as to which holders of common stock have the right to vote. So long as at least 3,000,000 shares of Series A remain outstanding, the holders of Series A will be allowed to elect three directors of the Company, the holders of the common stock will be allowed to elect two directors of the Company, and any remaining directors will be elected by the holders of preferred stock and common stock, voting together as a single class.

Conversion—Each share of preferred stock, at the option of the holder, is convertible into common stock determined by dividing the Original Series A issue price or Original Series B issue price, as applicable, by the conversion price applicable to such share in effect on the date the certificate is surrendered for conversion, subject to certain provisions for adjustment of the conversion price. Conversion of each share of preferred stock is automatic upon the closing of a firm commitment underwritten public offering with aggregate proceeds of not less than $30.0 million (before deduction of underwriting discounts and commissions) or the agreement or written consent of holders of at least seventy-five percent (75%) of the then-outstanding shares of preferred stock. As of December 31, 2012, all shares of preferred stock are convertible into common stock on a 3.1345-for-one basis.

12. Stock-Based Awards

2011 Equity Incentive Plan

In 2011, the Company adopted the 2011 Equity Incentive Plan (the Plan). The Plan provides for the granting of stock-based awards to employees, directors, and consultants under terms and provisions established by the Board of Directors. Under the terms of the Plan, options may be granted at an exercise price not less than fair market value. For employees holding more than 10% of the voting rights of all classes of stock, the exercise prices for incentive and nonstatutory stock options must be at least 110% of fair market of the common stock on the grant date, as determined by the Board of Directors. The terms of options granted under the Plan may not exceed ten years.

Options granted generally vest over a period of four years. Typically, the vesting schedule for option grants to newly hired employees provides that 1/4 of the grant vests upon the first anniversary of the employee's date of hire, with the remainder of the shares vesting monthly thereafter at a rate of 1/48 of the total shares subject to the option. All other options typically vest in equal monthly installments over the four-year vesting schedule.

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Notes to Financial Statements (continued)

12. Stock-Based Awards (continued)

A summary of activity under the 2011 Plan and related information are as follows:

		Options Outstanding			
	Shares Available for Grant	Number of Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value (In thousands)
Outstanding — December 31, 2010	—	—	—	—	
Shares reserved	2,378,684	—	—		
Options granted	(1,451,580)	1,451,580	$ 0.31		
Outstanding — December 31, 2011	927,104	1,451,580	0.31	9.88	
Shares reserved	1,377,836	—	—		
Options granted	(499,278)	499,278	0.81		
Options exercised	—	(420,308)	0.31		
Options cancelled	9,583	(9,583)	0.31		
Outstanding — December 31, 2012	1,815,245	1,520,967	$ 0.47	9.11	$ 2,038
Vested and exercisable — December 31, 2012		99,233	$ 0.31	8.88	$ 149
Vested and expected to vest — December 31, 2012		1,478,327	$ 0.47	9.11	$ 1,981

The aggregate intrinsic values of options outstanding, vested and exercisable, and vested and expected to vest were calculated as the difference between the exercise price of the options and the estimated fair value of the Company's common stock as determined by the Company's Board of Directors as of December 31, 2012. The total intrinsic value of options exercised during the years ended December 31, 2011 and 2012 and for the period from April 22, 2010 (Inception) through December 31, 2012 was $0, $211,000 and $211,000, respectively.

The options outstanding and exercisable by exercise price as of December 31, 2012, are as follows:

	Options Outstanding		Options Exercisable		
Exercise Price	Number Outstanding	Weighted-Average Remaining Contractual Life (in Years)	Number Exercisable	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Life (in Years)
$0.31	1,021,689	8.88	99,233	$ 0.31	8.88
$0.81	499,278	9.60	—	—	—
	1,520,967	9.11	99,233	$ 0.31	8.88

The weighted-average estimated fair value of stock options granted was $0.34, $0.47 and $0.38 per share of the Company's common stock during the years ended December 31, 2011 and 2012 and for the period from April 22, 2010 (Inception) through December 31, 2012, respectively. No options were granted in 2010.

The total estimated fair value of options vested during the years ended December 31, 2011 and 2012 and for the period from April 22, 2010 (Inception) through December 31, 2012 was $6,000, $172,000 and $178,000, respectively.

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Notes to Financial Statements (continued)

12. Stock-Based Awards (continued)

Founder's Stock

In connection with the Series A preferred stock financing, the Company entered into a stock repurchase agreement with the founder on June 16, 2011, where the 2,552,241 common shares previously owned by the founder are now subject to repurchase by the Company at the original issuance price in the event that the founder's employment is terminated either voluntarily or involuntarily. Such repurchase rights lapse over a period of two years from June 16, 2011. The Company calculated the fair value of these restricted shares at the time the restriction was added to the shares as $1,199,000 and is recording this amount as stock-based compensation ratably as the repurchase rights lapse. Stock-based compensation expense pertaining to the founder's stock was $218,000, $713,000 and $931,000 during the years ended December 31, 2011 and 2012 and for the period from April 22, 2010 (Inception) through December 31, 2012, respectively. As of December 31, 2012, 638,060 of these shares remained subject to repurchase and $268,000 of stock compensation remained unamortized.

Stock-Based Compensation Expense

Total stock-based compensation recognized was as follows (in thousands):

	Year Ended December 31,		Period from April 22, 2010 (Inception) through December 31, 2012
	2011	2012	
Research and development	$ 28	$ 130	$ 158
General and administrative	226	761	987
Total stock-based compensation expense	$ 254	$ 891	$ 1,145

As of December 31, 2012, the total unrecognized compensation expense related to unvested options, net of estimated forfeitures, was $495,000, which the Company expects to recognize over an estimated weighted average period of 2.8 years.

In determining the fair value of the stock-based awards, the Company uses the Black-Scholes option-pricing model and assumptions discussed below. Each of these inputs is subjective and generally requires significant judgment to determine.

Expected Term—The Company's expected term represents the period that the Company's stock-based awards are expected to be outstanding and is determined using the simplified method (based on the mid-point between the vesting date and the end of the contractual term).

Expected Volatility—Since the Company is privately held and does not have any trading history for its common stock, the expected volatility was estimated based on the average volatility for comparable publicly traded biopharmaceutical companies over a period equal to the expected term of the stock option grants. When selecting comparable publicly traded biopharmaceutical companies on which it has based its expected stock price volatility, the Company selected companies with comparable characteristics to it, including enterprise value, risk profiles, position within the industry, and with historical share price information sufficient to meet the expected life of the stock-based awards. The historical volatility data was computed using the daily closing prices for the selected companies' shares during the equivalent period of the calculated expected term of the stock-based awards. The Company will continue to apply this process until a sufficient amount of historical information regarding the volatility of its own stock price becomes available.

Risk-Free Interest Rate—The risk-free interest rate is based on the U.S. Treasury zero coupon issues in effect at the time of grant for periods corresponding with the expected term of option.

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Notes to Financial Statements (continued)

12. Stock-Based Awards (continued)

Expected Dividend—The Company has never paid dividends on its common stock and has no plans to pay dividends on its common stock. Therefore, the Company used an expected dividend yield of zero.

The fair value of stock option awards was estimated at the date of grant using a Black-Scholes option-pricing model with the following weighted average assumptions:

	Year Ended December 31,		Period from April 22, 2010 (Inception) through December 31, 2012
	2011	2012	
Expected term	6.25 years	6.25 years	6.25 years
Expected volatility	75%	67%	73%
Risk-free interest rate	1.15%	0.62%	1.01%
Dividend yield	—	—	—

13. Income Taxes

The Company did not record a provision or benefit for income taxes during the years ended December 31, 2011 and 2012. The Company has incurred net operating losses since inception. The Company has not reflected any benefit of such net operating loss carryforwards in the accompanying financial statements. The Company has established a full valuation allowance against its deferred tax assets due to the uncertainty surrounding the realization of such assets.

The effective tax rate of our provision for income taxes differs from the federal statutory rate as follows:

	Year Ended December 31,	
	2011	2012
Federal statutory income tax rate	34.0%	34.0%
State income taxes, net of federal benefit	5.3	6.0
Federal tax credits	5.5	8.6
Nondeductible permanent items	(1.5)	—
Stock compensation	(1.3)	(1.9)
Change in valuation allowance	(32.9)	(46.0)
Adjustment of loss carryforwards	(9.0)	—
Other	(0.1)	(0.7)
	0.0%	0.0%

The tax effect of temporary differences that give rise to significant portions of the deferred tax assets is presented below (in thousands):

	December 31,	
	2011	2012
Deferred tax assets:		
Net operating loss carryforwards	$ 1,812	$ 6,186
Tax credits	756	3,619
Other	(18)	272
Total deferred tax assets	2,550	10,077
Valuation allowance	(2,550)	(10,077)
Net deferred tax assets	$ —	$ —

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Notes to Financial Statements (continued)

13. Income Taxes (continued)

Additionally, the future utilization of the net operating loss carryforwards to offset future taxable income may be subject to an annual limitation, pursuant to Internal Revenue Code Section 382, as a result of ownership changes that may have occurred previously or that could occur in the future. A Section 382 analysis to determine the limitation of the net operating loss carryforwards has not been performed. Until this analysis has been performed, the deferred tax assets for net operating losses of $725,000 generated through December 31, 2012, have been removed from the deferred tax asset schedule and a corresponding decrease to the valuation allowance has been recorded. This represents the amount estimated to expire before utilization, assuming a change in ownership has occurred. The Company recorded unrecognized tax benefits for uncertainty in income taxes. Due to the existence of the valuation allowance, future changes in unrecognized tax benefits will not impact the effective tax rate. The valuation allowance increased by $7.5 million and $10.1 million during the year ended December 31, 2012 and for the period from April 22, 2010 (Inception) through December 31, 2012.

As of December 31, 2012, the Company had approximately $14.9 million and $19.3 million of federal and state NOL carryforwards available to reduce future taxable income that will begin to expire in 2030 for federal and 2030 for state tax purposes.

As of December 31, 2012, the Company also had research and development tax credit carryforwards of approximately $152,000 and $296,000 for federal and state purposes available to offset future regular and alternative minimum taxable income. If not utilized, the federal carryforwards will expire in various amounts beginning in 2030, and the state credits can be carried forward indefinitely.

On January 2, 2013, the American Taxpayer Relief Act of 2012 (the Act) was passed in to law. The Act included a retroactive extension of the U.S. research credit for 2012. Since the effects of the tax law changes are recognized in the first period the Company would recognize $109,000 of additional research credits as a discrete item during the first quarter of 2013. The tax effects of the research credits will be offset by valuation allowance and will not impact the financial statements.

As of December 31, 2012, the Company had an Orphan Drug Credit of approximately $4.8 million for federal tax purposes available to offset future regular and alternative minimum taxable income.

Uncertain Tax Positions

A reconciliation of the Company's unrecognized tax benefits for the years ended December 31, 2011 and 2012 is as follows (in thousands):

	December 31,	
	2011	2012
Balance at beginning of year	$ —	$ 324
Additions based on tax positions related to current year	324	1,227
Additions (reductions) for tax positions of prior years	—	—
Balance at end of year	$324	$1,551

The entire amount of the unrecognized tax benefits would not impact the Company's effective tax rate if recognized. The Company has elected to include interest and penalties as a component of tax expense. During the years ended December 31, 2011 and 2012, the Company did not recognize accrued interest and penalties related to unrecognized tax benefits. The Company does not anticipate that the amount of existing unrecognized tax benefits will significantly increase or decrease during the next 12 months.

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Notes to Financial Statements (continued)

13. Income Taxes (continued)

The Company files income tax returns in the U.S. federal jurisdiction and California tax jurisdictions. The federal and state income tax returns from inception to December 31, 2012 remain subject to examination.

14. Net Loss and Pro Forma Net Loss per Share Attributable to Common Stockholders

The following table sets forth the computation of the basic and diluted net loss per share attributable to common stockholders during the years ended December 31, 2011 and 2012 (in thousands, except share and per share data):

	Year Ended December 31,	
	2011	2012
Numerator:		
Net loss	$ (6,849)	$ (16,334)
Accretion and dividends on convertible preferred stock	(617)	(3,227)
Net loss attributable to common stockholders	$ (7,466)	$ (19,561)
Denominator:		
Weighted-average common shares outstanding	3,008,880	3,118,798
Less: weighted-average unvested common shares subject to repurchase	(1,391,496)	(1,741,591)
Weighted-average shares used to compute net loss per share attributable to common stockholders, basic and diluted	1,617,384	1,377,207
Net loss per share attributable to common stockholders, basic and diluted	$ (4.62)	$ (14.20)

The following weighted-average outstanding common stock equivalents were excluded from the computation of diluted net loss per share attributable to common stockholders for the periods presented because including them would have been antidilutive:

	December 31,	
	2011	2012
Convertible preferred stock	3,124,211	8,354,772
Stock options to purchase common stock	177,503	1,563,217
Common stock subject to repurchase	1,391,496	1,741,590
Convertible preferred stock warrants	294,120	327,853
	4,987,330	11,987,432

Unaudited Pro Forma

A dividend of $4.1 million is payable concurrent with the conversion of the Company's preferred stock, which has been calculated as if the conversion of preferred stock into common stock occurred as of January 17, 2014, and will be paid from the proceeds of an initial public offering as the Company incurred a net loss for the year ended December 31, 2012. As a result, the pro forma net loss per share attributable to common stockholders, basic and diluted, for the year ended December 31, 2012 gives effect to the number of shares that would be required to be issued at an assumed initial public offering price of $15.50 per share to pay the amount of dividends. The number of shares used in computing the Company's unaudited pro forma basic and diluted net loss per share attributable to common stockholders includes the assumed issuance of 267,419 shares of common stock. In addition, the calculation of the pro forma net loss per share attributable to common stockholders, basic and diluted, assumes the conversion of all outstanding shares of preferred stock into shares of common stock.

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

Notes to Financial Statements (continued)

14. Net Loss and Pro Forma Net Loss per Share Attributable to Common Stockholders (continued)

The following table sets forth the computation of the Company's unaudited pro forma basic and diluted net loss per share attributable to common stockholders during the year ended December 31, 2012 (in thousands, except for share and per share amounts):

	Year Ended December 31, 2012
Net loss	$ (16,334)
Dividends to be paid on convertible preferred stock	(4,145)
Change in fair value of convertible preferred stock warrant liabilities	302
Net loss used in computing pro forma net loss per share attributable to common stockholders, basic and diluted	$ (20,177)
Shares used in computing net loss per share attributable to common stockholders, basic and diluted	1,377,207
Shares required to be issued to pay the dividends payable	267,419
Pro forma adjustments to reflect assumed conversion of convertible preferred stock	8,354,772
Shares used in computing pro forma net loss per share attributable to common stockholders, basic and diluted	9,999,398
Pro forma net loss per share attributable to common stockholders, basic and diluted	$ (2.02)

15. Subsequent Events

On June 26, 2013, the Company notified BRI that it was exercising its option to license the rights to triheptanoin in all territories outside of the United States, Canada and Mexico. The option exercise fee associated with this is $750,000.

On August 29, 2013, the Company entered into a collaboration and license agreement with Kyowa Hakko Kirin Co. LTD. (KHK). Under the terms of this collaboration and license agreement, the Company and KHK will collaborate on the development and commercialization of certain products containing KRN23, an antibody directed towards FGF23, in the field of orphan diseases in the United States and Canada, or the profit share territory, and in the European Union, Switzerland, and Turkey, or the European territory, and the Company will have the right to develop and commercialize such products in the field of orphan diseases in Mexico and Central and South America, or Latin America. In the field of orphan diseases, and except for ongoing studies being conducted by KHK, the Company will be the lead party for development activities in the profit share territory and in the European territory until the applicable transition date. The Company will share the costs for development activities in the profit share territory and European territory conducted pursuant to the development plan before the applicable transition date equally with KHK. On the applicable transition date in the relevant territory, KHK will become the lead party and be responsible for these costs. However, the Company will continue to share the costs of the studies commenced prior to the applicable transition date equally with KHK. The Company has the primary responsibility for conducting certain research and development services. The Company is obligated to provide assistance in accordance with the agreed upon development plan as well as participate on various committees. If KRN23 is approved, the Company and KHK will share commercial responsibilities and profits in the profit share territory until the applicable transition date, KHK will commercialize KRN23 in the European territory and the Company will develop and commercialize KRN23 in Latin America. KHK will manufacture and supply KRN23 for clinical use globally and will manufacture and supply KRN23 for commercial use in the profit share territory and Latin America.

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ULTRAGENYX PHARMACEUTICAL INC.
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CONDENSED BALANCE SHEETS
(In thousands, except share and per share amounts)

	December 31, 2012 (Note 1)	September 30, 2013 (Unaudited)	Pro Forma Stockholders' Equity as of September 30, 2013 (Unaudited)
Assets			
Current assets:			
Cash and cash equivalents	$ 86,190	$ 6,049	
Short term investments	—	57,608	
Accounts receivable	—	38	
Prepaid expenses and other current assets	255	2,980	
Total current assets	86,445	66,675	
Property and equipment, net	1,362	1,308	
Restricted cash	476	451	
Other assets	33	158	
TOTAL ASSETS	$ 88,316	$ 68,592	
Liabilities, Convertible Preferred Stock and Stockholders' (Deficit) Equity			
Current liabilities:			
Accounts payable	$ 1,200	$ 2,890	
Accrued liabilities	1,913	2,643	$ 6,788
Deferred rent — current portion	75	75	
Total current liabilities	3,188	5,608	
Convertible preferred stock warrant liability	518	1,596	—
Other liabilities	270	234	
Total liabilities	3,976	7,438	
Commitments and contingencies			
Series A redeemable convertible preferred stock, par value of $0.001 per share — 35,377,556 shares authorized as of December 31, 2012 and September 30, 2013 (unaudited); 34,349,894 shares issued and outstanding as of December 31, 2012 and September 30, 2013 (unaudited), no shares authorized, issued and outstanding, pro forma (unaudited); redemption value of $90,704 of September 30, 2013 (unaudited)	37,458	44,073	—
Series B convertible preferred stock, par value of $0.001 per share — 27,081,680 shares authorized as of December 31, 2012 and September 30, 2013 (unaudited); 27,081,680 shares issued and outstanding as of December 31, 2012 and September 30, 2013 (unaudited), no shares authorized, issued and outstanding, pro forma (unaudited); aggregate liquidation preference of $76,316 as of September 30, 2013 (unaudited)	73,929	73,929	—
Stockholders' (deficit) equity:			
Common stock, par value of $0.001 per share — 85,000,000 shares authorized as of December 31, 2012 and September 30, 2013 (unaudited); 3,458,928 and 3,703,016 shares issued and outstanding as of December 31, 2012 and September 30, 2013 (unaudited), 250,000,000 shares authorized, 23,301,502 shares issued and outstanding, pro forma (unaudited)	3	4	23
Additional paid-in capital	8	8	115,422
Accumulated other comprehensive loss	—	(14)	(14)
Deficit accumulated during the development stage	(27,058)	(56,846)	(56,846)
Total stockholders' (deficit) equity	(27,047)	(56,848)	$ 58,605
Total liabilities, convertible preferred stock and stockholders' (deficit) equity	$ 88,316	$ 68,592	

See accompanying notes.

ULTRAGENYX PHARMACEUTICAL INC.
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CONDENSED STATEMENTS OF OPERATIONS
(Unaudited)
(In thousands, except share and per share amounts)

	Nine Months Ended September 30,		Period from April 22, 2010 (Inception) Through September 30, 2013
	2012	2013	
Operating expenses:			
Research and development	$ 8,866	$ 19,625	$ 37,941
General and administrative	2,441	3,130	8,610
Total operating expenses	11,307	22,755	46,551
Loss from operations	(11,307)	(22,755)	(46,551)
Other income (expense), net:			
Interest income	—	157	162
Interest expense	—	—	(318)
Other expense	(97)	(1,155)	(1,535)
Total other income (expense), net	(97)	(998)	(1,691)
Net loss	$ (11,404)	$ (23,753)	$ (48,242)
Net loss attributable to common stockholders	$ (12,749)	$ (31,624)	
Net loss per share attributable to common stockholders, basic and diluted	$ (12.35)	$ (9.70)	
Shares used in computing net loss per share attributable to common stockholders, basic and diluted	1,032,159	3,260,484	
Pro forma net loss per share attributable to common stockholders, basic and diluted		$ (1.16)	
Shares used in computing pro forma net loss per share attributable to common stockholders, basic and diluted		23,126,389	

See accompanying notes.

ULTRAGENYX PHARMACEUTICAL INC.
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CONDENSED STATEMENTS OF COMPREHENSIVE LOSS
(Unaudited)
(In thousands)

	Nine Months Ended September 30,		Period from April 22, 2010 (Inception) Through September 30, 2013
	2012	2013	
Net loss	$(11,404)	$(23,753)	$ (48,242)
Other comprehensive loss:			
Unrealized loss on available-for-sale securities	—	(14)	(14)
Total comprehensive loss	$(11,404)	$(23,767)	$ (48,256)

See accompanying notes.

ULTRAGENYX PHARMACEUTICAL INC.
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CONDENSED STATEMENTS OF CASH FLOWS
(Unaudited)
(In thousands)

	Nine Months Ended September 30,		Period from April 22, 2010 (Inception) Through September 30, 2013
	2012	2013	
Cash flows from operating activities:			
Net loss	$(11,404)	$(23,753)	$ (48,242)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	221	332	685
Amortization of premium on securities	—	972	972
Noncash interest expense	—	—	318
Stock-based compensation	694	447	1,592
Revaluation of preferred stock warrant liability	67	1,078	1,393
Changes in operating assets and liabilities:			
Accounts receivable	—	(38)	(38)
Prepaid expenses and other current assets	(10)	(2,725)	(2,980)
Other assets	5	(125)	(158)
Accounts payable	817	1,690	2,890
Accrued expenses and other liabilities	820	695	2,952
Net cash used in operating activities	(8,790)	(21,427)	(40,616)
Cash flows from investing activities:			
Purchase of property and equipment	(967)	(278)	(1,993)
Decrease (increase) in restricted cash	(100)	25	(451)
Purchase of investments	—	(63,056)	(63,056)
Proceeds from maturities of investments	—	4,462	4,462
Net cash used in investing activities	(1,067)	(58,847)	(61,038)
Cash flows from financing activities:			
Net proceeds from issuance of convertible preferred stock, net of issuance costs	15,080	—	103,888
Net proceeds from issuance of common stock	48	133	265
Proceeds from issuance of promissory notes	100	—	3,550
Net cash provided by financing activities	15,228	133	107,703
Net increase (decrease) in cash and cash equivalents	5,371	(80,141)	6,049
Cash and cash equivalents — Beginning of period	10,645	86,190	—
Cash and cash equivalents — End of period	$ 16,016	$ 6,049	$ 6,049

See accompanying notes.

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

Notes to Unaudited Interim Condensed Financial Statements

1. Summary of Significant Accounting Policies

Unaudited Interim Condensed Financial Statements

The interim condensed balance sheet as of September 30, 2013 and the statements of operations, comprehensive loss and cash flows for the nine months ended September 30, 2012 and 2013 are unaudited. The unaudited interim financial statements have been prepared on the same basis as the annual financial statements and, in the opinion of management, reflect all adjustments, which include only normal recurring adjustments, necessary to present fairly the Company's financial position as of September 30, 2013 and its results of operations and cash flows for the nine months ended September 30, 2012 and 2013. The financial data and the other financial information disclosed in these notes to financial statements related to the nine month periods are also unaudited. The results of operations for the nine months ended September 30, 2013 are not necessarily indicative of the results to be expected for the year ending December 31, 2013 or for any other future annual or interim period. The condensed balance sheet as of December 31, 2012 included herein was derived from the audited financial statements as of that date. These financial statements should be read in conjunction with the Company's audited financial statements included elsewhere in this prospectus.

Unaudited Pro Forma Stockholders' Equity

The pro forma stockholders' equity as of September 30, 2013 presents the Company's stockholders' equity as though all of the Company's outstanding convertible preferred stock had automatically converted into shares of common stock upon the completion of an initial public offering (IPO) of the Company's common stock. In addition, the pro forma stockholders' equity assumes the reclassification of the convertible preferred stock warrant liability to additional paid-in capital upon completion of an IPO of the Company's common stock, as the warrants upon an IPO become common stock warrants that are not subject to remeasurement. The pro forma stockholders' equity also assumes the payment in cash of a dividend on the convertible preferred stock which is triggered upon the conversion of the convertible preferred stock to common stock. For the purpose of this pro forma presentation, the dividend payable has been calculated as if the conversion occurred as of January 17, 2014, the date of this filing.

Use of Estimates

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

Additional Capital Requirements

The Company has incurred significant losses and negative cash flows from operations. At September 30, 2013, the Company had a total deficit accumulated during the development stage of $56.8 million and cash, cash equivalents and marketable securities of $63.7 million. Management believes that currently available resources
will provide sufficient funds to enable the Company to meet its obligations through at least December 31, 2013.

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Notes to Unaudited Interim Condensed Financial Statements (continued)

1. Summary of Significant Accounting Policies (continued)

However, if the Company's anticipated operating results are not achieved in future periods, planned expenditures may need to be reduced in order to extend the time period over which the then-available resources would be able to fund its operations. The Company will need to raise additional capital to fully implement its business plan.

Cash and Cash Equivalents

The Company considers all highly liquid investments with original maturities of three months or less at the time of purchase to be cash equivalents. Cash equivalents consist primarily of money market funds and are stated at fair value.

Marketable Securities

All investments have been classified as "available-for-sale" and are carried at estimated fair value as determined based upon quoted market prices or pricing models for similar securities. Management determines the appropriate classification of its investments in debt securities at the time of purchase and reevaluates such designation as of each balance sheet date. Unrealized gains and losses are excluded from earnings and were reported as a component of comprehensive loss. Realized gains and losses and declines in fair value judged to be other than temporary, if any, on available-for-sale securities are included in interest income and other expense, respectively. The cost of securities sold is based on the specific-identification method. Interest on marketable securities is included in interest income.

Concentration of Credit Risk and Other Risks and Uncertainties

Financial instruments that potentially subject the Company to a concentration of credit risk consist of cash, cash equivalents, and marketable securities. The Company's cash, cash equivalents, and marketable securities are held by financial institutions that management believes are of high credit quality. The Company's investment policy limits investments to fixed income securities denominated and payable in U.S. dollars such as U.S. government obligations, money market instruments and funds, corporate bonds, and asset-backed securities and places restrictions on maturities and concentrations by type and issuer. Such deposits may, at times, exceed federally insured limits. The Company has not experienced any losses on its deposits of cash and cash equivalents and its accounts are monitored by management to mitigate risk. The Company is exposed to credit risk in the event of default by the financial institutions holding its cash and cash equivalents and corporate bond issuers to the extent recorded in the balance sheets.

Deferred Offering Costs

Deferred offering costs, which primarily consist of direct incremental legal and accounting fees relating to the IPO, are capitalized. The deferred offering costs will be offset against IPO proceeds upon the consummation of the offering. In the event the offering is terminated, deferred offering costs will be expensed. As of September 30, 2013, $1.4 million of deferred offering costs were capitalized in prepaid and other current assets on the balance sheet. There were no such costs capitalized as of December 31, 2012.

Net Loss per Share Attributable to Common Stockholders

Basic net loss per share attributable to common stockholders is calculated by dividing the net loss attributable to common stockholders by the weighted average number of shares of common stock outstanding

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Unaudited Interim Condensed Financial Statements (continued)

1. Summary of Significant Accounting Policies (continued)

during the period without consideration of common stock equivalents. The net loss attributable to common stockholders is calculated by adjusting the net loss of the Company for the accretion on the Series A convertible preferred stock and cumulative dividends on Series A and B convertible preferred stock. Diluted net loss per share attributable to common stockholders is the same as basic net loss per share attributable to common stockholders, since the effects of potentially dilutive securities are antidilutive.

Unaudited Pro Forma Net Loss per Share Attributable to Common Stockholders

Pro forma basic and diluted net loss per share attributable to common stockholders has been computed to give effect to the conversion of the convertible preferred stock into common stock. Also, the numerator in the pro forma basic and diluted net loss per share attributable to common stockholders calculation has been adjusted to remove gains and losses resulting from remeasurement of the convertible preferred stock warrant liability as these amounts will be reclassified to additional paid-in capital upon a qualifying initial public offering of the Company's common stock, and has also been adjusted to reflect the payment of a dividend to the holders of the Company's preferred stock concurrent with the conversion of the Company's convertible preferred stock to common stock immediately prior to the completion of this offering. The denominator in the pro forma basic and diluted net loss per share attributable to common stockholders has been adjusted to give effect to the number of shares that would be required to be issued at an assumed public offering price of $15.50 per share to pay the $4.1 million dividend to the convertible preferred stockholders. The pro forma net loss per share attributable to common stockholders does not include the shares expected to be sold and related proceeds to be received from an initial public offering.

Recently Issued Accounting Pronouncements

In February 2013, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2013-02, *Other Comprehensive Income (Topic 220): Reporting of Amounts Reclassified Out of Accumulated Other Comprehensive Income*. ASU No. 2013-02 supersedes the presentation requirements for reclassifications out of accumulated other comprehensive income in ASU 2011-05 and 2011-12 and requires an entity to provide additional information about reclassifications out of accumulated other comprehensive income. The Company adopted this guidance on January 1, 2013 on a prospective basis. The adoption of this amendment did not have a material impact on the Company's results of operations or financial position.

Reverse Stock Split

In January 2014, the Company's board of directors and its stockholders approved an amendment to the Company's amended and restated certificate of incorporation to effect a reverse split of shares of our common stock on a 1-for-3.1345 basis (the "Reverse Stock Split"). The par values and the authorized shares of the common and convertible preferred stock were not adjusted as a result of the Reverse Stock Split, nor were the outstanding shares of preferred stock. All issued and outstanding common stock and related per share amounts contained in the financial statements have been retroactively adjusted to reflect this Reverse Stock Split for all periods presented. A proportional adjustment to the conversion ratio for each series of convertible preferred stock was also effected in connection with the reverse split. The Reverse Stock Split was effected on January 17, 2014.

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Unaudited Interim Condensed Financial Statements (continued)

2. Fair Value Measurements

Financial assets and liabilities are recorded at fair value. The carrying amount of certain financial instruments, including cash and cash equivalents, marketable securities, accounts payable and accrued liabilities approximate fair value due to their relatively short maturities. Assets and liabilities recorded at fair value on a recurring basis in the balance sheets are categorized based upon the level of judgment associated with the inputs used to measure their fair values. Fair value is defined as the exchange price that would be received for an asset or an exit price that would be paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The authoritative guidance on fair value measurements establishes a three-tier fair value hierarchy for disclosure of fair value measurements as follows:

Level 1—Inputs are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date;

Level 2—Inputs are observable, unadjusted quoted prices in active markets for similar assets or liabilities, unadjusted quoted prices for identical or similar assets or liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the related assets or liabilities; and

Level 3—Unobservable inputs that are significant to the measurement of the fair value of the assets or liabilities that are supported by little or no market data.

The Company's financial instruments consist of Level 1 and 2 assets and Level 3 liabilities. Where quoted prices are available in an active market, securities are classified as Level 1. Level 1 assets consist primarily of highly liquid money market funds that are included in cash and cash equivalents and restricted cash. The Company's Level 2 investments include corporate bonds. Level 2 inputs are based upon quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active and model-based valuation techniques for which all significant inputs are observable in the market or can be corroborated by observable market data for substantially the full term of the assets. Where applicable, these models project future cash flows and discount the future amounts to a present value using market-based observable inputs obtained from various third-party data providers, including but not limited to, benchmark yields, interest rate curves, reported trades, broker/dealer quotes and market reference data. Level 3 liabilities consist of the convertible preferred stock warrant liability. The determination of the fair value of the convertible preferred stock warrants is discussed in Note 4. Generally, increases or decreases in the fair value of the underlying convertible preferred stock would result in a directionally similar impact in the fair value measurement of the warrant liability.

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Unaudited Interim Condensed Financial Statements (continued)

2. Fair Value Measurements (continued)

The following table sets forth the fair value of the Company's financial assets and liabilities measured at fair value on a recurring basis based on the three-tier fair value hierarchy (in thousands):

	December 31, 2012			
	Level 1	Level 2	Level 3	Total
Financial Assets:				
Money market funds	$ 376	$ —	$ —	$ 376
Total financial assets	$ 376	$ —	$ —	$ 376
Financial Liabilities:				
Convertible preferred stock warrant liability	$ —	$ —	$ 518	$ 518
Total financial liabilities	$ —	$ —	$ 518	$ 518

	September 30, 2013			
	Level 1	Level 2	Level 3	Total
Financial Assets:				
Money market funds	$ 4,835	$ —	$ —	$ 4,835
Commercial paper	—	999	—	999
Corporate bonds	—	56,765	—	56,765
Total financial assets	$ 4,835	$57,764	$ —	$62,599
Financial Liabilities:				
Convertible preferred stock warrant liability	$ —	$ —	$ 1,596	$ 1,596
Total financial liabilities	$ —	$ —	$ 1,596	$ 1,596

The following table sets forth a summary of the changes in the fair value of the Company's Level 3 financial liabilities (in thousands):

Balance as of December 31, 2012	$ 518
Change in fair value recorded in other expense	1,078
Balance as of September 30, 2013	$1,596

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Unaudited Interim Condensed Financial Statements (continued)

3. Balance Sheet Components

Cash Equivalents, Restricted Cash and Marketable Securities

The fair values of cash equivalents, restricted cash and marketable securities classified as available-for-sale securities, consisted of the following:

	December 31, 2012			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
Money market funds	$ 376	$ —	$ —	$ 376
Total	$ 376	$ —	$ —	$ 376

	September 30, 2013			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
Money market funds	$ 4,835	$ —	$ —	$ 4,835
Commercial paper	999	—	—	999
Corporate bonds	56,779	7	(21)	56,765
Total	$ 62,613	$ 7	$ (21)	$ 62,599

The available-for-sale securities held as of September 30, 2013 had contractual maturities of less than two years.

Property and Equipment, net

Property and equipment, net consists of the following (in thousands):

	December 31, 2012	September 30, 2013
Research and development equipment	$ 225	$ 264
Office furniture and equipment	266	289
Computer equipment	187	235
Software	34	58
Leasehold improvements	1,003	1,147
Property and equipment, gross	1,715	1,993
Less accumulated depreciation and amortization	(353)	(685)
Property and equipment, net	$ 1,362	$ 1,308

Depreciation and amortization expense for the nine months ended September 30, 2012 and 2013 and the period from April 22, 2010 (Inception) through September 30, 2013 was $221,000, $332,000 and $685,000, respectively.

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Unaudited Interim Condensed Financial Statements (continued)

3. Balance Sheet Components (continued)

Accrued Liabilities

Accrued liabilities consist of the following (in thousands):

	December 31, 2012	September 30, 2013
Research and clinical trial expenses	$ 595	$ 733
Payroll and related expenses	1,302	1,370
Accrued professional services	—	440
Other	16	100
Total accrued liabilities	$ 1,913	$ 2,643

4. Convertible Preferred Stock Warrants

As of December 31, 2012 and September 30, 2013, outstanding warrants consisted of the following:

Convertible Preferred Stock Warrants:	Number of Warrants	Date Issued	Term	Exercise Price
Series A convertible preferred stock	241,803	June 2010	10 years	$ 1.034
Series A convertible preferred stock	592,417	February 2011	10 years	1.034
Series A convertible preferred stock	193,442	June 2011	10 years	1.034
Total convertible preferred stock warrants	1,027,662			

The fair value of the warrants was estimated to be $518,000 and $1.6 million as of December 31, 2012 and September 30, 2013, respectively. The key assumptions in the option-pricing valuation method as of December 31, 2012 and September 30, 2013 are summarized in the table below.

	December 31, 2012	September 30, 2013
Value of Company equity	$145.8 million	$240.3 million
Expected volatility	75.0%	75.0%
Expected time to liquidity event	2.0 years	0.5 – 1.5 years
Risk-free interest rate	0.25%	0.04 – 0.22%

The Company recorded $67,000, $1.1 million and $1.4 million to other expense for the nine months ended September 30, 2012 and 2013 and for the period from April 22, 2010 (Inception) through September 30, 2013, respectively, representing the change in fair value of the warrants between the issuance date and the end of the reporting period.

5. Convertible Preferred Stock

The holders of the Series A and Series B convertible preferred stock are entitled to receive dividends at the rate of $0.062 per share per annum, payable in the form of cash. Dividends accrue from day to day, whether or not declared, but will be paid only when, as, and if declared by the Board of Directors. After dividends have been paid to the holders of the preferred stock, any additional dividends shall be paid among the holders of the preferred stock and common stock then outstanding in proportion to the greatest whole number of shares of common stock held (assuming conversion of Preferred Stock). During 2012, $2.1 million of dividends were declared and paid to holders of Series A convertible preferred stock in the form of additional Series A convertible preferred stock. Dividends in arrears as of December 31, 2012 and September 30, 2013, totaled $159,000 and $3.0 million, respectively, for both series of preferred stock.

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Unaudited Interim Condensed Financial Statements (continued)

5. Convertible Preferred Stock (continued)

The Company initially recorded the Series A and Series B convertible preferred stock at their issuance price, which represents the carrying value. The Series A convertible preferred stock is redeemable at any time after June 16, 2017 once a written request to redeem such stock is received by the Company from holders of not less than seventy-five percent of the then outstanding Series A convertible preferred stock. As only the passage of time is required for the Series A convertible preferred stock to become redeemable, the difference in the initial carrying value of the Series A convertible preferred stock and their total redemption value is being accreted from the issuance date through the first redemption date of June 16, 2017. The Company recorded accretion of $116,000 and $6.6 million for the nine months ended September 30, 2012 and 2013, respectively.

6. License Agreements

Baylor Research Institute

In September 2012, the Company entered into a license agreement with Baylor Research Institute (BRI). Under the terms of this license agreement, BRI exclusively licensed to the Company certain intellectual property related to triheptanoin for North America. Under the license agreement, the Company paid BRI an up-front fee of $250,000 which was recorded as research and development expense during the year ended December 31, 2012.

The Company has an exclusive option to expand the licensed territory to a worldwide license if the previous holder of such territorial rights allows that option to lapse. The previous holder's option lapsed on December 31, 2012, and on June 26, 2013, the Company notified BRI that it was exercising its exclusive option to expand the licensed territory. The fee associated with this option exercise was $750,000, which was recorded as research and development expense during the nine months ended September 30, 2013.

Kyowa Hakko Kirin Co. LTD.

On August 29, 2013, the Company entered into a collaboration and license agreement with Kyowa Hakko Kirin Co. Ltd. (KHK). Under the terms of this collaboration and license agreement, the Company and KHK will collaborate on the development and commercialization of certain products containing KRN23, an antibody directed towards FGF23, in the field of orphan diseases in the United States and Canada, or the profit share territory, and in the European Union, Switzerland, and Turkey, or the European territory, and the Company will have the right to develop and commercialize such products in the field of orphan diseases in Mexico and Central and South America, or Latin America. In the field of orphan diseases, and except for ongoing studies being conducted by KHK, the Company will be the lead party for development activities in the profit share territory and in the European territory until, with respect to the profit share territory, the fifth anniversary of the first commercial sale in the United States in the first indication and, with respect to the European territory, the date on which marketing approval for a licensed product for the first indication is obtained in the European territory on a country-by-country basis; each such date is referred to herein as the applicable transition date. The Company will share the costs for development activities in the profit share territory and European territory conducted pursuant to the development plan before the applicable transition date equally with KHK. On the applicable transition date in the relevant territory, KHK will become the lead party and be responsible for these costs. However, the Company will continue to share the costs of the studies commenced prior to the applicable transition date equally with KHK. The Company has the primary responsibility for conducting certain research and development services. The Company is obligated to provide assistance in accordance with the agreed upon development plan as well as participate on various committees. If KRN23 is approved, the Company and KHK will share commercial responsibilities and profits in the profit share territory until the applicable transition date, KHK will commercialize KRN23 in the European territory and the Company will develop and commercialize KRN23 in

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Unaudited Interim Condensed Financial Statements (continued)

6. License Agreements (continued)

Latin America. KHK will manufacture and supply KRN23 for clinical use globally and will manufacture and supply KRN23 for commercial use in the profit share territory and Latin America.

The Company has incurred net development costs of $42,000 in connection with this agreement during the nine months ended September 30, 2013 and such costs have been recognized as research and development expenses.

7. Stock-Based Awards

2011 Equity Incentive Plan

The following table summarizes option activity under the 2011 Plan and related information during the nine months ended September 30, 2013:

	Shares Available for Grant	Options Outstanding	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value (in thousands)
Outstanding — December 31, 2012	1,815,245	1,520,967	$ 0.47	9.11	
Options granted	(502,465)	502,465	2.07		
Options exercised	—	(244,088)	0.53		
Options cancelled	252,572	(252,572)	1.25		
Outstanding — September 30, 2013	1,565,352	1,526,772	$ 0.86	8.65	$ 9,170
Vested and exercisable — September 30, 2013		257,215	$ 0.41	8.26	$ 1,661
Vested and expected to vest — September 30, 2013		1,488,701	$ 0.86	8.65	$ 8,945

The aggregate intrinsic values of options outstanding, vested and exercisable, and vested and expected to vest were calculated as the difference between the exercise price of the options and the estimated fair value of the Company's common stock as determined by the Company's Board of Directors as of September 30, 2013. The total intrinsic value of options exercised during the nine months ended September 30, 2012 and 2013 was $77,000 and $622,000, respectively.

The total estimated fair value of options vested during the nine months ended September 30, 2012 and 2013 was $83,000 and $158,000, respectively.

Founder's Stock

On June 16, 2011, 2,552,241 common shares were issued to the Company's founder, which are subject to repurchase by the Company at the original issuance price in the event that the founder's employment is terminated either voluntarily or involuntarily. Such repurchase rights lapse over a period of two years from June 16, 2011. The Company calculated the fair value of these restricted shares at the time the restriction was added to the shares as $1.2 million and was recording this amount as stock-based compensation ratably as the repurchase rights lapse. As of September 30, 2013, all of the founder's shares have vested and thus are no longer subject to repurchase.

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

Notes to Unaudited Interim Condensed Financial Statements (continued)

7. Stock-Based Awards (continued)

Stock Compensation Expense

Total stock-based compensation recognized for stock-based awards was as follows (in thousands):

	Nine Months Ended September 30,		Period from April 22, 2010 (Inception) through September 30, 2013
	2012	2013	
Research and development	$ 98	$ 139	$ 297
General and administrative	596	308	1,295
Total stock-based compensation expense	$ 694	$ 447	$ 1,592

As of September 30, 2013, there was $799,000 of total unrecognized compensation costs, net of estimated forfeitures, related to nonvested stock option awards that will be recognized on a straight-line basis over the weighted average remaining period of 2.4 years.

The weighted-average estimated fair value of stock options granted was $0.47 and $1.38 per share of the Company's common stock during the nine months ended September 30, 2012 and 2013, respectively. The estimated grant date fair value of the Company's equity-based awards issued to employees was calculated using the Black-Scholes option-pricing model, based on the following assumptions:

	Nine Months Ended September 30,	
	2012	2013
Expected term	6.25 years	6.25 years
Expected volatility	67%	75%
Risk-free interest rate	0.61%	0.92%
Dividend yield	—	—

8. Net Loss and Pro Forma Net Loss per Share Attributable to Common Stockholders

The following table sets forth the computation of the basic and diluted net loss per share attributable to common stockholders during the nine months ended September 30, 2012 and 2013 (in thousands, except share and per share data):

	Nine Months Ended September 30,	
	2012	2013
Numerator:		
Net loss	$ (11,404)	$ (23,753)
Accretion and dividends on convertible preferred stock	(1,345)	(7,871)
Net loss attributable to common stockholders	$ (12,749)	$ (31,624)
Denominator:		
Weighted-average common shares outstanding	3,060,445	3,529,264
Less: weighted-average unvested common shares subject to repurchase	(2,028,286)	(268,780)
Weighted average shares used to compute net loss per share attributable to common stockholders, basic and diluted	1,032,159	3,260,484
Net loss per share attributable to common stockholders, basic and diluted	$ (12.35)	$ (9.70)

ULTRAGENYX PHARMACEUTICAL INC.
(A Development Stage Company)

Notes to Unaudited Interim Condensed Financial Statements (continued)

8. Net Loss and Pro Forma Net Loss per Share Attributable to Common Stockholders (continued)

The following weighted-average outstanding common stock equivalents were excluded from the computation of diluted net loss per share attributable to common stockholders for the periods presented because including them would have been antidilutive:

	September 30,	
	2012	2013
Convertible preferred stock	9,794,521	19,598,486
Stock options to purchase common stock	1,523,513	1,599,858
Common stock subject to repurchase	2,028,286	268,780
Convertible preferred stock warrants	327,853	327,853
	13,674,173	21,794,977

Unaudited Pro Forma

A dividend of $4.1 million is payable concurrent with the conversion of the Company's preferred stock, which has been calculated as if the conversion of preferred stock into common stock occurred as of January 17, 2014, and will be paid from the proceeds of an initial public offering as the Company incurred a net loss for the nine months ended September 30, 2013. As a result, the pro forma net loss per share attributable to common stockholders, basic and diluted, for the nine months ended September 30, 2013 gives effect to the number of shares that would be required to be issued at an assumed initial public offering price of $15.50 per share to pay the amount of dividends. The number of shares used in computing the Company's unaudited pro forma basic and diluted net loss per share attributable to common stockholders includes the assumed issuance of 267,419 shares of common stock. In addition, the calculation of the pro forma net loss per share attributable to common stockholders, basic and diluted, assumes the conversion of all outstanding shares of preferred stock into shares of common stock.

The following table sets forth the computation of the Company's unaudited pro forma basic and diluted net loss per share attributable to common stockholders during the nine months ended September 30, 2013 (in thousands, except for share and per share amounts):

	Nine Months Ended September 30, 2013
Net loss	$ (23,753)
Dividends to be paid on convertible preferred stock	(4,145)
Change in fair value of convertible preferred stock warrant liabilities	1,078
Net loss used in computing pro forma net loss per share attributable to common stockholders, basic and diluted	$ (26,820)
Shares used in computing net loss per share attributable to common stockholders, basic and diluted	3,260,484
Shares required to be issued to pay the dividends payable	267,419
Pro forma adjustments to reflect assumed conversion of convertible preferred stock	19,598,486
Shares used in computing pro forma net loss per share attributable to common stockholders, basic and diluted	23,126,389
Pro forma net loss per share attributable to common stockholders, basic and diluted	$ (1.16)

ULTRAGENYX PHARMACEUTICAL INC.
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Notes to Unaudited Interim Condensed Financial Statements (continued)

9. Defined Contribution Plan

In March 2013, the Company began to sponsor a 401(k) retirement plan, in which substantially all of its full-time employees are eligible to participate. Participants may contribute a percentage of their annual compensation to this plan, subject to statutory limitations. The Company did not provide any contributions during the nine months ended September 30, 2013.

4,838,710 shares

Common stock

Prospectus

J.P. Morgan **Morgan Stanley**

Cowen and Company

Canaccord Genuity

, 2014

Until , 2014, all dealers that buy, sell or trade in our common stock, 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 underwriters and with respect to their unsold allotments or subscriptions.

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 The NASDAQ Global Market listing fee.

Item	Amount to be paid
SEC registration fee	$ 12,185
FINRA filing fee	14,690
The NASDAQ Global Market Listing fee	125,000
Printing and engraving expenses	225,000
Legal fees and expenses	1,500,000
Accounting fees and expenses	1,000,000
Blue Sky, qualification fees and expenses	7,500
Transfer Agent fees and expenses	10,000
Miscellaneous expenses	105,625
Total	$ 3,000,000

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.

Article VI of our amended and restated certificate of incorporation (the "Charter"), provides that no director of our company shall be personally liable to us or our stockholders for monetary damages for any breach of fiduciary duty as a director, except for liability (1) for any breach of the director's duty of loyalty to us or our stockholders, (2) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (3) in respect of unlawful dividend payments or stock redemptions or repurchases, or (4) for any transaction from which the director derived an improper personal benefit. In addition, our Charter provides that if the Delaware General Corporation Law is amended to authorize the further elimination or limitation of the liability of directors, then the liability of a director of our company shall be eliminated or limited to the fullest extent permitted by the Delaware General Corporation Law, as so amended.

Article VI of the Charter further provides that any repeal or modification of such article by our stockholders or amendment to the Delaware General Corporation Law will not adversely affect any right or protection existing at the time of such repeal or modification with respect to any acts or omissions occurring before such repeal or modification of a director serving at the time of such repeal or modification.

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.

We also maintain an insurance policy that 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, attached hereto as exhibit 1.1, 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 against certain liabilities.

Item 15. Recent Sales of Unregistered Securities.

In the three years preceding the filing of this registration statement, we or our California corporation predecessor have issued the following securities that were not registered under the Securities Act. Issuances made prior to June 2011 were made by Ultragenyx Pharmaceutical, Inc., a California corporation. The share numbers under the heading "Common Stock Purchase Agreements" below reflect (i) that, in connection with our reincorporation from California to Delaware in June 2011, each outstanding share of common stock was converted into 80 shares of the new Delaware corporation and (ii) the 1-for-3.1345 reverse stock split we implemented on January 17, 2014.

Common Stock Purchase Agreements

On April 27, 2010, we issued 2,552,241 shares of common stock for consideration of $0.00039 per share, for an aggregate purchase price of $1,000.00 to Emil D. Kakkis. Emil D. Kakkis is our current President and Chief Executive Officer and one of our directors.

On November 19, 2010, we issued 76,567 shares of common stock for consideration of $0.00039 per share, for an aggregate purchase price of $30.00 to Nobelpharma Co. Ltd.

On February 11, 2011, we issued 26,288 shares of common stock for consideration of $0.00039 per share, for an aggregate purchase price of $10.30 to William E. Aliski. Mr. Aliski is one of our directors.

On February 28, 2011, we issued 26,288 shares of common stock for consideration of $0.00039 per share, for an aggregate purchase price of $10.30 to Jonathan K. Wright.

On March 11, 2011, we issued 42,545 shares of common stock for consideration of $0.00039 per share, for an aggregate purchase price of $16.67 to William E. Aliski. Mr. Aliski is one of our directors.

On March 28, 2011, we issued 26,288 shares of common stock for consideration of $0.0039 per share, for an aggregate purchase price of $103.00 to Steven Jungles. Mr. Jungles is our Senior Vice President, Technical Operations.

On April 6, 2011, we issued 288,403 shares of common stock for consideration of $0.00039 per share, for an aggregate purchase price of $113.00 to John Klock.

We claimed exemption from registration under the Securities Act for the sale and issuance of these shares of common stock by virtue of Section 4(a)(2) and/or Regulation D promulgated thereunder as transactions not involving any public offering. All of the purchasers of the shares of common stock for which we relied on Section 4(a)(2) and/or Regulation D represented that they were accredited investors as defined under the Securities Act. We claimed such exemption on the basis that (a) the purchasers in each case represented that they intended to acquire the securities for investment only and not with a view to the distribution thereof and that they either received adequate information about the registrant or had access, through employment or other relationships, to such information and (b) appropriate legends were affixed to the stock certificates issued in such transactions.

Convertible Notes and Series A Convertible Preferred Stock Warrants

On June 30, 2010, we entered into a Note and Warrant Purchase Agreement with Emil D. Kakkis, our President and Chief Executive Officer and one of our directors. Pursuant to the Note and Warrant Purchase Agreement, we issued a convertible promissory note in the amount of $1.0 million to Dr. Kakkis and also issued him a warrant to purchase up to 241,803 shares of our Series A convertible preferred stock.

On February 15, 2011, we entered into a Note and Warrant Purchase Agreement with the John and Cynthia Klock Trust. Pursuant to the Note and Warrant Purchase Agreement, we issued a convertible promissory note in the amount of $1.5 million to the John and Cynthia Klock Trust and also issued to the trust a warrant to purchase up to 507,786 shares of our Series A convertible preferred stock.

On February 23, 2011, we entered into a Note and Warrant Purchase Agreement with William Aliski, one of our directors. Pursuant to the Note and Warrant Purchase Agreement, we issued a convertible promissory note in the amount of $250,000 to Mr. Aliski and also issued him a warrant to purchase up to 84,631 shares of our Series A convertible preferred stock.

On June 14, 2011, we entered into a Note and Warrant Purchase Agreement with Emil D. Kakkis, our President and Chief Executive Officer and one of our directors. Pursuant to the Note and Warrant Purchase Agreement, we issued a convertible promissory note in the amount of $300,000 to Dr. Kakkis and also issued him a warrant to purchase up to 72,541 shares of our Series A convertible preferred stock.

On June 14, 2011, we entered into a second Note and Warrant Purchase Agreement with Emil D. Kakkis, our President and Chief Executive Officer and one of our directors. Pursuant to the Note and Warrant Purchase Agreement, we issued a convertible promissory note in the amount of $500,000 to Dr. Kakkis and also issued him a warrant to purchase up to 120,901 shares of our Series A convertible preferred stock.

We claimed exemption from registration under the Securities Act for the sale and issuance of these securities by virtue of Section 4(a)(2) and/or Regulation D promulgated thereunder as transactions not involving any public offering. All of the purchasers of unregistered securities for which we relied on Section 4(a)(2) and/or Regulation D represented that they were accredited investors as defined under the Securities Act. We claimed such exemption on the basis that (a) the purchasers in each case represented that they intended to acquire the securities for investment only and not with a view to the distribution thereof and that they either received adequate information about the registrant or had access, through employment or other relationships, to such information and (b) appropriate legends were affixed to the stock certificates issued in such transactions.

Series A Convertible Preferred Stock Financing

On June 16, 2011, we sold an aggregate of 18,052,464 shares of our Series A convertible preferred stock to eight investors at a purchase price of $1.034 per share, for an aggregate purchase price of approximately

$15.0 million in cash and $3.7 million in converted bridge notes. On July 16, 2012, we sold, pursuant to a second tranche closing, an aggregate of 14,604,895 shares of our Series A convertible preferred stock to six investors at a purchase price of $1.034 per share, for an aggregate purchase price of $15.1 million in cash. We claimed exemption from registration under the Securities Act for the sale and issuance of these securities by virtue of Section 4(a)(2) and/or Regulation D promulgated thereunder as transactions not involving any public offering. All of the purchasers of unregistered securities for which we relied on Section 4(a)(2) and/or Regulation D represented that they were accredited investors as defined under the Securities Act. We claimed such exemption on the basis that (a) the purchasers in each case represented that they intended to acquire the securities for investment only and not with a view to the distribution thereof and that they either received adequate information about the registrant or had access, through employment or other relationships, to such information and (b) appropriate legends were affixed to the stock certificates issued in such transactions.

Series A Paid-in-Kind Dividends

On August 16, 2012, we issued an aggregate of 1,193,088 shares of our Series A convertible preferred stock to holders of our Series A convertible preferred stock in accordance with Article IV.B.1.(a) of our Certificate of Incorporation that was filed with the Secretary of State of the State of Delaware on June 13, 2011. We claimed exemption from registration under the Securities Act for the sale and issuance of these securities by virtue of Section 4(a)(2) and/or Regulation D promulgated thereunder as transactions not involving any public offering.

On December 14, 2012, we issued an aggregate of 499,447 shares of our Series A convertible preferred stock to holders of our Series A convertible preferred stock in accordance with Article IV.B.1.(a) of our Certificate of Incorporation that was filed with the Secretary of State of the State of Delaware on June 13, 2011. We claimed exemption from registration under the Securities Act for the sale and issuance of these securities by virtue of Section 4(a)(2) and/or Regulation D promulgated thereunder as transactions not involving any public offering.

Series B Convertible Preferred Stock Financing

On December 18, 2012, we sold an aggregate of 27,081,680 shares of our Series B convertible preferred stock to 34 investors at a purchase price of $2.7694 per share, for an aggregate purchase price of approximately $75 million in cash. We claimed exemption from registration under the Securities Act for the sale and issuance of these securities by virtue of Section 4(a)(2) and/or Regulation D promulgated thereunder as transactions not involving any public offering. All of the purchasers of unregistered securities for which we relied on Section 4(a)(2) and/or Regulation D represented that they were accredited investors as defined under the Securities Act. We claimed such exemption on the basis that (a) the purchasers in each case represented that they intended to acquire the securities for investment only and not with a view to the distribution thereof and that they either received adequate information about the registrant or had access, through employment or other relationships, to such information and (b) appropriate legends were affixed to the stock certificates issued in such transactions.

Stock Options

From November 17, 2011 through January 10, 2014, we granted stock options to employees under our 2011 Equity Incentive Plan, as amended, covering an aggregate of 3,218,659 shares of common stock, at a weighted-average average exercise price of $2.55 per share. Of these, options covering an aggregate of 262,134 shares were cancelled without being exercised and we sold an aggregate of 746,275 shares of common stock to employees for cash consideration in the aggregate amount of $0.3 million upon the exercise of stock options.

We claimed exemption from registration under the Securities Act for these sales and issuances under Section 4(a)(2) of the Securities Act in that such sales and issuances did not involve a public offering or under Rule 701 promulgated under the Securities Act, in that they were offered and sold either pursuant to written compensatory plans or pursuant to a written contract relating to compensation, as provided by Rule 701.

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.

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.

Signatures

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant has duly caused this Amendment No. 2 to Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in Novato, California, on January 17, 2014.

ULTRAGENYX PHARMACEUTICAL INC.

By: /s/ EMIL D. KAKKIS
Emil D. Kakkis, M.D., Ph.D.
President and Chief Executive Officer

Pursuant to the requirements of the Securities Act, this Amendment No. 2 to Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

Signature	Title	Date
/S/ EMIL D. KAKKIS Emil D. Kakkis, M.D., Ph.D.	Director, President and Chief Executive Officer *(Principal Executive Officer)*	January 17, 2014
/S/ SHALINI SHARP Shalini Sharp	Senior Vice President, Chief Financial Officer *(Principal Financial and Accounting Officer)*	January 17, 2014
* Eran Nadav, Ph.D.	Chairman of the Board	January 17, 2014
* Benjamin Auspitz	Director	January 17, 2014
* Mårten Steen, M.D., Ph.D.	Director	January 17, 2014
* William Aliski	Director	January 17, 2014

*By: /s/ SHALINI SHARP
Shalini Sharp
Attorney-in-fact

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Index to Financial Statements

Exhibit Index

Exhibit Number	Exhibit Description	Incorporated by Reference			Filed Herewith
		Form	Date	Number	
1.1	Form of Underwriting Agreement				X
3.1	Amended and Restated Certificate of Incorporation, as currently in effect	S-1	11/8/2013	3.1	
3.2	Bylaws, as currently in effect	S-1	11/8/2013	3.2	
3.3	Certificate of Amendment to Amended and Restated Certificate of Incorporation, filed January 17, 2014				X
3.4	Amended and Restated Certificate of Incorporation, to be in effect upon completion of this offering				X
3.5	Amended and Restated Bylaws, to be in effect upon completion of this offering				X
4.1	Reference is made to Exhibits 3.1 through 3.5				
4.2	Form of Common Stock Certificate	S-1	11/8/2013	4.2	
4.3	Warrant to purchase Series A Preferred Stock of the Registrant, dated as of June 30, 2010, issued to Emil D. Kakkis, M.D., Ph.D.	S-1	11/8/2013	4.3	
4.4	Warrant to purchase Series A Preferred Stock of the Registrant, dated as of February 15, 2011, issued to the John and Cynthia Klock Charitable Trust	S-1	11/8/2013	4.4	
4.5	Warrant to purchase Series A Preferred Stock of the Registrant, dated as of February 23, 2011, issued to William E. Aliski	S-1	11/8/2013	4.5	
4.6	Warrant to purchase Series A Preferred Stock of the Registrant, dated as of June 14, 2011, issued to Emil D. Kakkis, M.D., Ph.D.	S-1	11/8/2013	4.6	
4.7	Warrant to purchase Series A Preferred Stock of the Registrant, dated as of June 14, 2011, issued to Emil D. Kakkis, M.D., Ph.D.	S-1	11/8/2013	4.7	
4.8	Amended and Restated Investors' Rights Agreement, dated December 18, 2012, among the Registrant and the investors named therein	S-1	11/8/2013	4.8	
5.1	Opinion of Ropes & Gray LLP				X
10.1†	Collaboration and License Agreement, dated as of August 29, 2013, between the Registrant and Kyowa Hakko Kirin Co., Ltd.	S-1	12/23/2013	10.1	
10.2†	License Agreement, dated as of March 1, 2011, between the Registrant and AAIPharma Services Corp.	S-1	12/23/2013	10.2	
10.3†	License Agreement, dated as of September 20, 2012, between the Registrant and Baylor Research Institute	S-1	12/23/2013	10.3	
10.4†	Amendment to the License Agreement, dated as of March 22, 2013, between the Registrant and Baylor Research Institute	S-1	11/8/2013	10.4	
10.5†	Exclusive License Agreement, dated as of April 23, 2012, between the Registrant and HIBM Research Group	S-1	11/8/2013	10.5	
10.6†	Collaboration and License Agreement, dated as of September 30, 2010, between the Registrant and Nobelpharma Co., Ltd.	S-1	12/23/2013	10.6	
10.7†	License Agreement, dated as of September 1, 2012, between the Registrant and St. Jude Children's Research Hospital	S-1	12/23/2013	10.7	

Exhibit Number	Exhibit Description	Incorporated by Reference			Filed Herewith
		Form	Date	Number	
10.8†	Exclusive License Agreement, dated as of November 22, 2010, between the Registrant and Saint Louis University	S-1	12/23/2013	10.8	
10.9†	Supply Agreement, dated as of November 19, 2012, between the Registrant and CREMER OLEO GmbH & Co KG	S-1	12/23/2013	10.9	
10.10†	Development and Clinical Supply Agreement, dated as of August 31, 2012, between the Registrant and Rentschler Biotechnologie GmbH	S-1	11/8/2013	10.10	
10.11#	2011 Equity Incentive Plan (including forms of Stock Option Grant Notice and Stock Option Agreement thereunder)	S-1	11/8/2013	10.11	
10.12#	Amendment to the 2011 Equity Incentive Plan	S-1	11/8/2013	10.12	
10.13#	2014 Incentive Plan				X
10.14#	Form of Incentive Stock Option Agreement				X
10.15#	Form of Non-Statutory Stock Option Agreement (Employees)				X
10.16#	Form on Non-Statutory Stock Option Agreement (Directors)				X
10.17#	Form of Restricted Stock Unit Agreement (Employees)				X
10.18#	Form of Restricted Stock Unit Agreement (Directors)				X
10.19#	2014 Employee Stock Purchase Plan				X
10.20#	Executive Employment Agreement, dated as of June 15, 2011, between the Registrant and Emil D. Kakkis, M.D., Ph.D.	S-1	11/8/2013	10.18	
10.21#	Offer Letter, dated as of October 31, 2011, between the Registrant and Thomas Kassberg	S-1	11/8/2013	10.19	
10.22#	Offer Letter, dated March 12, 2012, between the Registrant and Shalini Sharp	S-1	11/8/2013	10.20	
10.23#	Form of Indemnification Agreement				X
10.24	Standard Lease, dated as of July 5, 2011, between the Registrant and Condiotti Enterprises, Inc.	S-1	11/8/2013	10.22	
10.25	License and Services Agreement, dated as of September 24, 2010, between the Registrant and The Buck Institute for Age Research	S-1	11/8/2013	10.23	
10.26	Amendment No. 1 to License and Services Agreement, dated as of September 4, 2012, between the Registrant and The Buck Institute for Research on Aging	S-1	11/8/2013	10.24	
10.27#	Corporate Bonus Plan				X
23.1	Consent of Independent Registered Public Accounting Firm				X
23.2	Consent of Ropes & Gray LLP (included in Exhibit 5.1)				
24.1	Power of Attorney	S-1	11/8/2013	24.1	
99.1	Consent of Matthew Fust	S-1	11/8/2013	99.1	
99.2	Consent of Clay Siegall				X

† Portions of this exhibit (indicated by asterisks) have been omitted pursuant to a request for confidential treatment and this exhibit has been filed separately with the SEC.

# Indicates management contract or compensatory plan.

Exhibit 1.1

ULTRAGENYX PHARMACEUTICAL INC.

[ ] Shares of Common Stock

Underwriting Agreement

, 2014

J. P. Morgan Securities LLC
Morgan Stanley & Co. LLC

As Representatives of the
several Underwriters listed
in Schedule 1 hereto

c/o J. P. Morgan Securities LLC
383 Madison Avenue
New York, New York 10179

c/o Morgan Stanley & Co. LLC
1585 Broadway
New York, New York 10036

Ladies and Gentlemen:

Ultragenyx Pharmaceutical Inc., a Delaware corporation (the "Company"), proposes to issue and sell to the several Underwriters listed in Schedule 1 hereto (the "Underwriters"), for whom you are acting as representatives (the "Representatives"), an aggregate of shares of common stock, par value $0.001 per share (the "Common Stock"), of the Company (the "Underwritten Shares") and, at the option of the Underwriters, up to an additional shares of Common Stock of the Company (the "Option Shares"). The Underwritten Shares and the Option Shares are herein referred to as the "Shares". The shares of Common Stock of the Company to be outstanding after giving effect to the sale of the Shares are referred to herein as the "Stock".

J.P. Morgan Securities LLC has agreed to reserve a portion of the Shares to be purchased by it under this Agreement, up to Shares, for sale to the Company's [directors, officers, and certain employees and other parties related to the Company] (collectively, "Participants"), as set forth in the Prospectus (as hereinafter defined) under the heading "Underwriting" (the "Directed Share Program"). The Shares to be sold by J.P. Morgan Securities LLC and its affiliates pursuant to the Directed Share Program are referred to hereinafter as the "Directed Shares". Any Directed Shares not orally confirmed for purchase by any Participant by [ ] [A/P].M., New York City time on the business day on which this Agreement is executed will be offered to the public by the Underwriters as set forth in the Prospectus.

The Company hereby confirms its agreement with the several Underwriters concerning the purchase and sale of the Shares, as follows:

1. Registration Statement. The Company has prepared and filed with the Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended, and the rules and regulations of the Commission thereunder (collectively, the "Securities Act"), a registration statement on Form S-1 (File No. 333-192244), including a prospectus, relating to the Shares. Such registration statement, as amended at the time it became effective, including the information, if any, deemed pursuant

to Rule 430A, 430B or 430C under the Securities Act to be part of the registration statement at the time of its effectiveness ("Rule 430 Information"), is referred to herein as the "Registration Statement"; and as used herein, the term "Preliminary Prospectus" means each prospectus included in such registration statement (and any amendments thereto) before effectiveness, any prospectus filed with the Commission pursuant to Rule 424(a) under the Securities Act and the prospectus included in the Registration Statement at the time of its effectiveness that omits Rule 430 Information, and the term "Prospectus" means the prospectus in the form first used (or made available upon request of purchasers pursuant to Rule 173 under the Securities Act) in connection with confirmation of sales of the Shares. If the Company has filed an abbreviated registration statement pursuant to Rule 462(b) under the Securities Act (the "Rule 462 Registration Statement"), then any reference herein to the term "Registration Statement" shall be deemed to include such Rule 462 Registration Statement. Capitalized terms used but not defined herein shall have the meanings given to such terms in the Registration Statement and the Prospectus.

At or prior to the Applicable Time (as defined below), the Company had prepared the following information (collectively with the pricing information set forth on Annex B, the "Pricing Disclosure Package"): a Preliminary Prospectus dated , 2014 and each "free-writing prospectus" (as defined pursuant to Rule 405 under the Securities Act) listed on Annex B hereto.

"Applicable Time" means [ ] [A/P].M., New York City time, on , 2014.

2. Purchase of the Shares by the Underwriters.

(a) The Company agrees to issue and sell the Underwritten Shares to the several Underwriters as provided in this Agreement, and each Underwriter, on the basis of the representations, warranties and agreements set forth herein and subject to the conditions set forth herein, agrees, severally and not jointly, to purchase from the Company the respective number of Underwritten Shares set forth opposite such Underwriter's name in Schedule 1 hereto at a price per share (the "Purchase Price") of $.

In addition, the Company agrees to issue and sell the Option Shares to the several Underwriters as provided in this Agreement, and the Underwriters, on the basis of the representations, warranties and agreements set forth herein and subject to the conditions set forth herein, shall have the option to purchase, severally and not jointly, from the Company the Option Shares at the Purchase Price less an amount per share equal to any dividends or distributions declared by the Company and payable on the Underwritten Shares but not payable on the Option Shares.

If any Option Shares are to be purchased, the number of Option Shares to be purchased by each Underwriter shall be the number of Option Shares which bears the same ratio to the aggregate number of Option Shares being purchased as the number of Underwritten Shares set forth opposite the name of such Underwriter in Schedule 1 hereto (or such number increased as set forth in Section 10 hereof) bears to the aggregate number of Underwritten Shares being purchased from the Company by the several Underwriters, subject, however, to such adjustments to eliminate any fractional Shares as the Representatives in their sole discretion shall make.

The Underwriters may exercise the option to purchase Option Shares at any time in whole, or from time to time in part, on or before the thirtieth day following the date of the Prospectus, by written notice from the Representatives to the Company. Such notice shall set forth the aggregate number of Option Shares as to which the option is being exercised and the date and time when the Option Shares are to be delivered and paid for, which may be the same date and time as the Closing Date (as hereinafter defined) but shall not be earlier than the Closing Date or later than the tenth full business day (as hereinafter defined) after the date of such notice (unless such time and date are postponed in accordance with the

provisions of Section 10 hereof). Except with respect to Option Shares to be purchased on the Closing Date (for which notice shall be given at least one business day prior to the Closing Date), if any, any such notice shall be given at least two business days prior to the date and time of delivery specified therein.

(b) The Company understands that the Underwriters intend to make a public offering of the Shares as soon after the effectiveness of this Agreement as in the judgment of the Representatives is advisable, and initially to offer the Shares on the terms set forth in the Prospectus. The Company acknowledges and agrees that the Underwriters may offer and sell Shares to or through any affiliate of an Underwriter.

(c) Payment for the Shares shall be made by wire transfer in immediately available funds to the account specified by the Company to the Representatives in the case of the Underwritten Shares, at the offices of Latham & Watkins LLP, counsel for the Underwriters, at 140 Scott Drive, Menlo Park, California 94025 at 10:00 A.M., New York City time, on , 2014, or at such other time or place on the same or such other date, not later than the fifth business day thereafter, as the Representatives and the Company may agree upon in writing or, in the case of the Option Shares, on the date and at the time and place specified by the Representatives in the written notice of the Underwriters' election to purchase such Option Shares. The time and date of such payment for the Underwritten Shares is referred to herein as the "Closing Date", and the time and date for such payment for the Option Shares, if other than the Closing Date, is herein referred to as the "Additional Closing Date".

Payment for the Shares to be purchased on the Closing Date or the Additional Closing Date, as the case may be, shall be made against delivery to the Representatives for the respective accounts of the several Underwriters of the Shares to be purchased on such date or the Additional Closing Date, as the case may be, with any transfer taxes payable in connection with the sale of such Shares duly paid by the Company. Delivery of the Shares shall be made through the facilities of The Depository Trust Company ("DTC") unless the Representatives shall otherwise instruct.

(d) The Company acknowledges and agrees that the Underwriters are acting solely in the capacity of an arm's length contractual counterparty to the Company with respect to the offering of Shares contemplated hereby (including in connection with determining the terms of the offering) and not as a financial advisor or a fiduciary to, or an agent of, the Company or any other person. Additionally, neither the Representatives nor any other Underwriter is advising the Company or any other person as to any legal, tax, investment, accounting or regulatory matters in any jurisdiction. The Company shall consult with its own advisors concerning such matters and shall be responsible for making its own independent investigation and appraisal of the transactions contemplated hereby, and the Underwriters shall have no responsibility or liability to the Company with respect thereto. Any review by the Underwriters of the Company, the transactions contemplated hereby or other matters relating to such transactions will be performed solely for the benefit of the Underwriters and shall not be on behalf of the Company.

3. Representations and Warranties of the Company. The Company represents and warrants to each Underwriter that:

(a) *Preliminary Prospectus*. No order preventing or suspending the use of any Preliminary Prospectus has been issued by the Commission, and each Preliminary Prospectus included in the Pricing Disclosure Package, at the time of filing thereof, complied in all material respects with the Securities Act, and no Preliminary Prospectus, at the time of filing thereof, contained any untrue statement of a material fact or omitted to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided that the Company makes no representation and warranty with

respect to any statements or omissions made in reliance upon and in conformity with information relating to any Underwriter furnished to the Company in writing by such Underwriter through the Representatives expressly for use in any Preliminary Prospectus, it being understood and agreed that the only such information furnished by any Underwriter consists of the information described as such in Section 7(b) hereof.

(b) *Pricing Disclosure Package*. The Pricing Disclosure Package as of the Applicable Time did not, and as of the Closing Date and as of the Additional Closing Date, as the case may be, will not, contain any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided that the Company makes no representation and warranty with respect to any statements or omissions made in reliance upon and in conformity with information relating to any Underwriter furnished to the Company in writing by such Underwriter through the Representatives expressly for use in such Pricing Disclosure Package, it being understood and agreed that the only such information furnished by any Underwriter consists of the information described as such in Section 7(b) hereof.

(c) *Issuer Free Writing Prospectus*. Other than the Registration Statement, the Preliminary Prospectus and the Prospectus, the Company (including its agents and representatives, other than the Underwriters in their capacity as such) has not prepared, used, authorized, approved or referred to and will not prepare, use, authorize, approve or refer to any "written communication" (as defined in Rule 405 under the Securities Act) that constitutes an offer to sell or solicitation of an offer to buy the Shares (each such communication by the Company or its agents and representatives (other than a communication referred to in clause (i) below) an "Issuer Free Writing Prospectus") other than (i) any document not constituting a prospectus pursuant to Section 2(a)(10)(a) of the Securities Act or Rule 134 under the Securities Act or (ii) the documents listed on Annex B hereto, each electronic road show and any other written communications approved in writing in advance by the Representatives. Each such Issuer Free Writing Prospectus complied in all material respects with the Securities Act, has been or will be (within the time period specified in Rule 433) filed in accordance with the Securities Act (to the extent required thereby) and, when taken together with any other Issuer Free Writing Prospectus, the Preliminary Prospectus accompanying, or delivered prior to delivery of, such Issuer Free Writing Prospectus, did not, and as of the Closing Date and as of the Additional Closing Date, as the case may be, will not, contain any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided that the Company makes no representation and warranty with respect to any statements or omissions made in each such Issuer Free Writing Prospectus or Preliminary Prospectus in reliance upon and in conformity with information relating to any Underwriter furnished to the Company in writing by such Underwriter through the Representatives expressly for use in such Issuer Free Writing Prospectus or Preliminary Prospectus, it being understood and agreed that the only such information furnished by any Underwriter consists of the information described as such in Section 7(b) hereof. Each such Issuer Free Writing Prospectus, as of its issue date and at all subsequent times through the completion of the public offer and sale of the Shares or until any earlier date that the Company notified or notifies the Representatives as described in Section 4(d), did not, does not and will not include any information that conflicted, conflicts or will conflict with the information contained in the Registration Statement or the Prospectus.

(d) *Emerging Growth Company*. From the time of initial confidential submission of the Registration Statement to the Commission (or, if earlier, the first date on which the Company engaged directly or through any person authorized to act on its behalf in any Testing-the-Waters

Communication) through the date hereof, the Company has been and is an "emerging growth company," as defined in Section 2(a) of the Securities Act (an "Emerging Growth Company"). "Testing-the-Waters Communication" means any oral or written communication with potential investors undertaken in reliance on Section 5(d) of the Securities Act.

(e) *Testing-the-Waters Materials*. The Company (i) has not alone engaged in any Testing-the-Waters Communications other than Testing-the-Waters Communications with the consent of the Representatives with entities that are qualified institutional buyers within the meaning of Rule 144A under the Securities Act or institutions that are accredited investors within the meaning of Rule 501 under the Securities Act and (ii) has not authorized anyone other than the Representatives to engage in Testing-the-Waters Communications. The Company reconfirms that the Representatives have been authorized to act on its behalf in undertaking Testing-the-Waters Communications. The Company has not distributed or approved for distribution any Written Testing-the-Waters Communications other than those listed on Annex C hereto. "Written Testing-the-Waters Communication" means any Testing-the-Waters Communication that is a written communication within the meaning of Rule 405 under the Securities Act. Any individual Written Testing-the-Waters Communication does not conflict with the information contained in the Registration Statement or the Pricing Disclosure Package, complied in all material respects with the Securities Act, and when taken together with the Pricing Disclosure Package as of the Applicable Time, did not, and as of the Closing Date and as of the Additional Closing Date, as the case may be, will not, contain any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading.

(f) *Registration Statement and Prospectus.* The Registration Statement has been declared effective by the Commission. No order suspending the effectiveness of the Registration Statement has been issued by the Commission, and no proceeding for that purpose or pursuant to Section 8A of the Securities Act against the Company or related to the offering of the Shares has been initiated or, to the knowledge of the Company, threatened by the Commission; as of the applicable effective date of the Registration Statement and any post-effective amendment thereto, the Registration Statement and any such post-effective amendment, as of the date of such amendment, complied and will comply in all material respects with the Securities Act, and did not and will not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary in order to make the statements therein not misleading; and as of the date of the Prospectus and any amendment or supplement thereto and as of the Closing Date and as of the Additional Closing Date, as the case may be, the Prospectus complied and will comply in all material respects with the Securities Act and will not contain any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided that the Company makes no representation and warranty with respect to any statements or omissions made in reliance upon and in conformity with information relating to any Underwriter furnished to the Company in writing by such Underwriter through the Representatives expressly for use in the Registration Statement and the Prospectus and any amendment or supplement thereto, it being understood and agreed that the only such information furnished by any Underwriter consists of the information described as such in Section 7(b) hereof.

(g) *Financial Statements*. The financial statements (including the related notes thereto) of the Company included in the Registration Statement, the Pricing Disclosure Package and the Prospectus comply in all material respects with the applicable requirements of the Securities Act and present fairly, in all material respects, the financial position of the Company as

of the dates indicated and the results of its operations and the changes in its cash flows for the periods specified; such financial statements have been prepared in conformity with generally accepted accounting principles in the United States ("GAAP") applied on a consistent basis throughout the periods covered thereby, except in the case of unaudited, interim financial statements, which are subject to normal year-end adjustments and do not contain certain footnotes as permitted by the applicable rules of the Commission, and any supporting schedules included in the Registration Statement present fairly, in all material respects, the information required to be stated therein; and the other financial information included in the Registration Statement, the Pricing Disclosure Package and the Prospectus has been derived from the accounting records of the Company and presents fairly, in all material respects, the information shown thereby; and the *pro forma* financial information and the related notes thereto included in the Registration Statement, the Pricing Disclosure Package and the Prospectus have been prepared in accordance with the applicable requirements of the Securities Act and the assumptions underlying such pro forma financial information are reasonable and are set forth in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

(h) *No Material Adverse Change*. Since the date of the most recent financial statements of the Company included in the Registration Statement, the Pricing Disclosure Package and the Prospectus, (i) there has not been any change in the capital stock (other than the issuance of shares of Common Stock upon exercise of stock options and warrants described as outstanding in, and the grant of options and awards under existing equity incentive plans described in, the Registration Statement, the Pricing Disclosure Package and the Prospectus), short-term debt or long-term debt of the Company, or any dividend or distribution of any kind declared, set aside for payment, paid or made by the Company on any class of capital stock, or any material adverse change, or any development that would be reasonably expected to result in a material adverse change, in or affecting the business, properties, management, financial position, stockholders' equity or results of operations or prospects of the Company; (ii) the Company has not entered into any transaction or agreement (whether or not in the ordinary course of business) that is material to the Company or incurred any liability or obligation, direct or contingent, that is material to the Company; and (iii) the Company has not sustained any loss or interference with its business that is material to the Company and that is either from fire, explosion, flood or other calamity, whether or not covered by insurance, or from any labor disturbance or dispute or any action, order or decree of any court or arbitrator or governmental or regulatory authority, except in each case as otherwise disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

(i) *Organization and Good Standing*. The Company has been duly organized and is validly existing and in good standing under the laws of its jurisdiction of organization, is duly qualified to do business and is in good standing in each jurisdiction in which its ownership or lease of property or the conduct of its business requires such qualification, and has all power and authority necessary to own or hold its properties and to conduct the business in which it is engaged, except where the failure to be so qualified or in good standing or have such power or authority would not, individually or in the aggregate, be reasonably expected to have a material adverse effect on the business, properties, management, financial position, stockholders' equity, results of operations or prospects of the Company or on the performance by the Company of its obligations under this Agreement (a "Material Adverse Effect"). The Company does not own or control, directly or indirectly, any corporation, association or other entity.

(j) *Capitalization*. The Company has an authorized capitalization as set forth in the Registration Statement, the Pricing Disclosure Package and the Prospectus under the heading "Capitalization" and "Description of Capital Stock"; all the outstanding shares of capital stock of

the Company have been duly and validly authorized and issued and are fully paid and non-assessable and are not subject to any pre-emptive or similar rights that have not been duly waived or satisfied; except as described in or expressly contemplated by the Pricing Disclosure Package and the Prospectus, there are no outstanding rights (including, without limitation, pre-emptive rights), warrants or options to acquire, or instruments convertible into or exchangeable for, any shares of capital stock or other equity interest in the Company, or any contract, commitment, agreement, understanding or arrangement of any kind relating to the issuance of any capital stock of the Company, any such convertible or exchangeable securities or any such rights, warrants or options; the capital stock of the Company conforms in all material respects to the description thereof contained in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

(k) *Stock Options*. With respect to the stock options (the "Stock Options") granted pursuant to the stock-based compensation plans of the Company (the "Company Stock Plans"), (i) to the Company's knowledge, each Stock Option intended to qualify as an "incentive stock option" under Section 422 of the Internal Revenue Code of 1986, as amended (the "Code")) so qualifies, (ii) each grant of a Stock Option was duly authorized no later than the date on which the grant of such Stock Option was by its terms to be effective (the "Grant Date") by all necessary corporate action, including, as applicable, approval by the board of directors of the Company (or a duly constituted and authorized committee thereof) and any required stockholder approval by the necessary number of votes or written consents, and the award agreement governing such grant (if any), to the Company's knowledge, was duly executed and delivered by each party thereto, (iii) each such grant was made in accordance with the terms of the Company Stock Plans, the Securities Exchange Act of 1934, as amended, and the rules and regulations of the Commission thereunder (collectively, the "Exchange Act") and the rules of the NASDAQ Global Market and any other exchange on which Company securities are traded, and (iv) each such grant was properly accounted for in accordance with GAAP in the financial statements (including the related notes) of the Company. Each Company Stock Plan is accurately described in all material respects in the Registration Statement, the Pricing Disclosure Package and the Prospectus. The Company has not knowingly granted, and there is no and has been no policy or practice of the Company of granting, Stock Options prior to, or otherwise coordinating the grant of Stock Options with, the release or other public announcement of material information regarding the Company or its results of operations or prospects.

(l) *Due Authorization*. The Company has full right, power and authority to execute and deliver this Agreement and to perform its obligations hereunder; and all action required to be taken for the due and proper authorization, execution and delivery by it of this Agreement and the consummation by it of the transactions contemplated hereby has been duly and validly taken.

(m) *Underwriting Agreement*. This Agreement has been duly authorized, executed and delivered by the Company.

(n) *The Shares*. The Shares to be issued and sold by the Company hereunder have been duly authorized by the Company and, when issued and delivered and paid for as provided herein, will be duly and validly issued, will be fully paid and nonassessable and will conform to the descriptions thereof in the Registration Statement, the Pricing Disclosure Package and the Prospectus; and the issuance of the Shares is not subject to any preemptive or similar rights.

(o) *Listing*. The Shares have been approved for listing on the NASDAQ Global Market, subject to notice of issuance.

(p) *Description of the Underwriting Agreement*. This Agreement conforms in all material respects to the description thereof contained in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

(q) *No Violation or Default.* The Company is not (i) in violation of its charter or by-laws or similar organizational documents; (ii) in default, and no event has occurred that, with notice or lapse of time or both, would constitute such a default, in the due performance or observance of any term, covenant or condition contained in any indenture, mortgage, deed of trust, loan agreement or other agreement or instrument to which the Company is a party or by which the Company is bound or to which any of the property or assets of the Company is subject; or (iii) in violation of any law or statute or any judgment, order, rule or regulation of any court or arbitrator or governmental or regulatory authority, except, in the case of clauses (ii) and (iii) above, for any such default or violation that would not, individually or in the aggregate, have a Material Adverse Effect.

(r) *No Conflicts.* The execution, delivery and performance by the Company of this Agreement, the issuance and sale of the Shares and the consummation of the transactions contemplated by this Agreement will not (i) conflict with or result in a breach or violation of any of the terms or provisions of, or constitute a default under, or result in the creation or imposition of any lien, charge or encumbrance upon any property or assets of the Company pursuant to, any indenture, mortgage, deed of trust, loan agreement or other agreement or instrument to which the Company is a party or by which the Company is bound or to which any of the property or assets of the Company is subject, (ii) result in any violation of the provisions of the charter or by-laws of the Company or (iii) result in the violation of any law or statute or any judgment, order, rule or regulation of any court or arbitrator or governmental or regulatory authority, except, in the case of clauses (i) and (iii) above, for any such conflict, breach, violation or default that would not reasonably be expected to, individually or in the aggregate, have a Material Adverse Effect.

(s) *No Integration*. The Company has not, prior to the date hereof, made any offer or sale of any securities that would be integrated with the offer and sale of the Shares contemplated by this Agreement pursuant to the Securities Act or the interpretation thereof by the Commission.

(t) *No Consents Required.* No consent, filing, approval, authorization, order, license, registration or qualification of or with any court or arbitrator or governmental or regulatory authority is required for the execution, delivery and performance by the Company of this Agreement, the issuance and sale of the Shares and the consummation of the transactions contemplated by this Agreement, except for the registration of the Shares under the Securities Act and such consents, approvals, authorizations, orders and registrations or qualifications as may be required by the Financial Industry Regulatory Authority, Inc. ("FINRA") or the NASDAQ Stock Market and under applicable state securities laws in connection with the purchase and distribution of the Shares by the Underwriters.

(u) *Legal Proceedings*. Except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, there are no legal, governmental or regulatory investigations, actions, suits or proceedings pending to which the Company is or may be a party or to which any property of the Company is or may be the subject that, individually or in the aggregate, if determined adversely to the Company, could reasonably be expected to have a Material Adverse Effect or have a material adverse effect on the power or ability of the Company to perform its obligations under this Agreement or to consummate the transactions contemplated hereby; no such investigations, actions, suits or proceedings are threatened or, to the knowledge of the Company, contemplated by any governmental or regulatory authority or threatened by others; and (i) there are no current or pending legal, governmental or regulatory actions, suits or

proceedings that are required under the Securities Act to be described in the Registration Statement, the Pricing Disclosure Package or the Prospectus that are not so described in the Registration Statement, the Pricing Disclosure Package and the Prospectus and (ii) there are no contracts or other documents that are required under the Securities Act to be filed as exhibits to the Registration Statement or described in the Registration Statement, the Pricing Disclosure Package or the Prospectus that are not so filed as exhibits to the Registration Statement or described in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

(v) *Independent Accountants*. Ernst & Young LLP, who has certified certain financial statements of the Company, is an independent registered public accounting firm with respect to the Company within the applicable rules and regulations adopted by the Commission and the Public Company Accounting Oversight Board (United States) and as required by the Securities Act.

(w) *Title to Real and Personal Property*. The Company has good and marketable title in fee simple (in the case of real property) to, or has valid and marketable rights to lease or otherwise use, all items of real and personal property and assets that are material to the business of the Company, in each case free and clear of all liens, encumbrances, claims and defects and imperfections of title except those that (i) do not materially interfere with the use made and proposed to be made of such property by the Company or (ii) could not reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect.

(x) *Title to Intellectual Property*. Except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company owns, or has valid, binding and enforceable licenses for, or other rights to use on reasonable terms, the patents and patent applications, copyrights, trademarks, trademark registrations, service marks, service mark registrations, trade names, service names and know-how (including trade secrets and other unpatented and/or unpatentable proprietary or confidential information, systems or procedures) used in the conduct of, or necessary for the proposed conduct of, the business of the Company in the manner described in the Registration Statement, the Pricing Disclosure Package and the Prospectus (collectively, the "Company Intellectual Property"); except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, to the knowledge of the Company, the patents, trademarks, and copyrights included within the Company Intellectual Property are valid, enforceable, and subsisting, and there is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the validity, enforceability or scope of any Company Intellectual Property and the Company is unaware of any facts which would form a reasonable basis for such claim; other than as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, (i) there is no pending or threatened action, suit, proceeding or claim by others that the Company infringes, misappropriates or otherwise violates, or would, upon the commercialization of any product or service described in the Registration Statement, the Pricing Disclosure Package or the Prospectus, infringe or otherwise misappropriate or violate any rights of others with respect to any of the Company's products, proposed products, processes and the Company has not received any notice of any such claim of infringement, misappropriation or violation; (ii) to the knowledge of the Company, neither the sale nor use of any of products, proposed products or processes of the Company referred to in the Registration Statement, the Pricing Disclosure Package or the Prospectus do or will, infringe, interfere or conflict with any right or valid patent claim of any third party, and (iii) to the knowledge of the Company, no third party has any ownership right in or to any Company Intellectual Property that is owned by the Company, and, to the knowledge of the Company, no third party has any ownership right in or to any Company Intellectual Property in any field of use that is exclusively licensed to the Company, other than any licensor to the

Company of such Company Intellectual Property and (iv) to the knowledge of the Company, none of the technology employed by the Company has been obtained or is being used by the Company in violation of any contractual obligation binding on the Company or upon any of its officers, directors or employees, and the Company is not aware of any facts that it believes would form a reasonable basis for a successful challenge that any of its employees are in or have ever been in violation of any term of any employment contract, patent disclosure agreement, invention assignment agreement, non-competition agreement, non-solicitation agreement, nondisclosure agreement or any restrictive covenant to or with a former employer where such violation relates to such employee's breach of a confidentiality obligation, obligation to assign to the Company Intellectual Property, or obligation not to use third party intellectual property or other proprietary rights on behalf of the Company. Except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, all patents and patent applications owned by, and, to the knowledge of the Company, all patent and patent applications licensed to the Company or under which the Company has rights have, been duly and properly filed and maintained; to the knowledge of the Company, the parties prosecuting such applications have complied with their duty of candor and disclosure to the U.S. Patent and Trademark Office (the "USPTO") in connection with such applications; and the Company is not aware of any facts required to be disclosed to the USPTO that were not disclosed to the USPTO and which would preclude the grant of a patent in connection with any such application or could form the basis of a finding of invalidity with respect to any patents that have issued with respect to such applications.

(y) *FDA Compliance*. Except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company: (A) is and at all times has been in compliance with all statutes, rules or regulations of the U.S. Food and Drug Administration ("FDA") and other comparable federal, state, local or foreign governmental and regulatory authorities ("Governmental Authority") applicable to the ownership, testing, development, manufacture, packaging, processing, use, distribution, storage, import, export or disposal of any product under development, manufactured or distributed by the Company ("Applicable Laws"), except where such noncompliance would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect; (B) has not received any FDA Form 483, notice of adverse finding, warning letter, untitled letter or other correspondence or notice from the FDA or any Governmental Authority alleging or asserting material noncompliance with any Applicable Laws or any licenses, certificates, approvals, clearances, exemptions, authorizations, permits and supplements or amendments thereto required by any such Applicable Laws ("Authorizations"); (C) possesses all Authorizations, except where failure to possess an Authorization would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect, and such Authorizations are valid and in full force and effect and the Company is in compliance with the terms of such Authorizations, except where such noncompliance would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect; (D) has not received written notice of any claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action from the FDA or any Governmental Authority or third party alleging that any product, operation or activity is in material violation of any Applicable Laws or Authorizations and has no knowledge that the FDA or any Governmental Authority or third party is considering any such claim, litigation, arbitration, action, suit, investigation or proceeding; (E) has not received notice that the FDA or any Governmental Authority has taken, is taking or intends to take action to limit, suspend, modify or revoke any material Authorizations and has no knowledge that the FDA or any Governmental Authority is considering such action; and (F) has filed, obtained, maintained or submitted all reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments as required by any Applicable Laws or Authorizations except where failure to do so would not, individually or in the aggregate,

reasonably be expected to have a Material Adverse Effect and that all such reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were materially complete and correct on the date filed (or were corrected or supplemented by a subsequent submission).

(z) *Clinical Studies*. The studies, tests and preclinical and clinical trials conducted by or, to the Company's knowledge, on behalf of the Company that are described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, or the results of which are referred to in the Registration Statement, the Pricing Disclosure Package and the Prospectus, as applicable, were and, if still ongoing, are being conducted in all material respects in accordance with standard medical and scientific research standards and Applicable Laws, including, without limitation, the Federal Food, Drug and Cosmetic Act and the rules and regulations promulgated thereunder (collectively, "FFDCA"); the descriptions of the results of such studies, tests and trials contained in the Registration Statement, the Pricing Disclosure Package and the Prospectus are, to the Company's knowledge, accurate and complete in all material respects and fairly present the data derived from such studies, tests and trials; except to the extent disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company is not aware of any studies, tests or trials, the results of which the Company believes reasonably call into question the study, test, or trial results described or referred to in the Registration Statement, the Pricing Disclosure Package and the Prospectus when viewed in the context in which such results are described and the clinical state of development; and, except to the extent disclosed in the Registration Statement, the Pricing Disclosure Package or the Prospectus, the Company has not received any notices or correspondence from the FDA or any Governmental Authority requiring the termination or suspension of any studies, tests or preclinical or clinical trials conducted by or on behalf of the Company that are described in the Registration Statement, the Pricing Disclosure Package and the Prospectus or the results of which are referred to in the Registration Statement, the Pricing Disclosure Package and the Prospectus, other than ordinary course communications with respect to modifications in connection with the design and implementation of such trials.

(aa) *No Undisclosed Relationships*. No relationship, direct or indirect, exists between or among the Company, on the one hand, and the directors, officers, stockholders, customers or suppliers of the Company, on the other, that is required by the Securities Act to be described in the Registration Statement and the Prospectus and that is not so described in such documents and in the Pricing Disclosure Package.

(bb) *Investment Company Act*. The Company is not and, after giving effect to the offering and sale of the Shares and the application of the proceeds thereof as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, will not be required to register as an "investment company" or an entity "controlled" by an "investment company" within the meaning of the Investment Company Act of 1940, as amended, and the rules and regulations of the Commission thereunder (collectively, the "Investment Company Act").

(cc) *Taxes*. The Company has paid all federal, state, local and foreign taxes and filed all tax returns required to be paid or filed through the date hereof, except where the failure to file would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect; and except as otherwise disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, there is no tax deficiency that has been, or could reasonably be expected to be, asserted against the Company or any of its properties or assets and which would reasonably be expected to have a Material Adverse Effect.

(dd) *Licenses and Permits*. The Company possesses all licenses, certificates, permits and other authorizations issued by, and has made all declarations and filings with, the appropriate federal, state, local or foreign governmental or regulatory authorities that are necessary for the ownership or lease of its properties or the conduct of its business as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, except where the failure to possess or make the same would not, individually or in the aggregate, have a Material Adverse Effect; and except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company has not received notice of any revocation or modification of any such license, certificate, permit or authorization and has no reason to believe that any such license, certificate, permit or authorization will not be renewed in the ordinary course. To the Company's knowledge, no party granting any such licenses has taken any action to limit, suspend or revoke the same in any material respect.

(ee) *No Labor Disputes*. No labor disturbance by or dispute with employees of the Company exists or, to the knowledge of the Company, is contemplated or threatened, and the Company is not aware of any existing or imminent labor disturbance by, or dispute with, the employees of any of its principal suppliers, contractors or customers, except as would not have a Material Adverse Effect.

(ff) *Compliance with and Liability under Environmental Laws*. (i) The Company (a) is, and since inception was, in compliance with any and all applicable federal, state, local and foreign laws, rules, regulations, requirements, decisions, judgments, decrees, orders and the common law relating to pollution or the protection of the environment, natural resources or human health or safety, including those relating to the generation, storage, treatment, use, handling, transportation, Release or threat of Release of Hazardous Materials (collectively, "Environmental Laws"), (b) has received and is in compliance with all permits, licenses, certificates or other authorizations or approvals required of it under applicable Environmental Laws to conduct its business, (c) has not received notice of any actual or potential liability under or relating to, or actual or potential violation of, any Environmental Laws, including for the investigation or remediation of any Release or threat of Release of Hazardous Materials, and has no knowledge of any event or condition that would reasonably be expected to result in any such notice, (d) is not conducting or paying for, in whole or in part, any investigation, remediation or other corrective action pursuant to any Environmental Law at any location, and (e) is not a party to any order, decree or agreement that imposes any obligation or liability under any Environmental Law, and (ii) there are no costs or liabilities associated with Environmental Laws of or relating to the Company, except in the case of each of (i) and (ii) above, for any such matter, as would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect; and (iii) except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, (a) there are no proceedings that are pending, or, to the knowledge of the Company, contemplated, against the Company under any Environmental Laws in which a governmental entity is also a party, other than such proceedings regarding which it is reasonably believed no monetary sanctions of $100,000 or more will be imposed, (b) the Company is not aware of any facts or issues regarding its compliance with Environmental Laws, or liabilities or other obligations under Environmental Laws, including the Release or threat of Release of Hazardous Materials, that, individually or in the aggregate, would reasonably be expected to have a Material Adverse Effect, and (c) the Company does not anticipate material capital expenditures relating to any Environmental Laws.

(gg) *Hazardous Materials*. There has been no storage, generation, transportation, use, handling, treatment, Release or threat of Release of Hazardous Materials by, relating to or caused by the Company (or, to the knowledge of the Company, any other entity (including any

predecessor) for whose acts or omissions the Company is or would reasonably be expected to be liable) at, on, under or from any property or facility now or previously owned, operated or leased by the Company, or at, on, under or from any other property or facility, in violation of any Environmental Laws or in a manner or amount or to a location that would reasonably be expected to result in any liability under any Environmental Law, except for any violation or liability which would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect. "Hazardous Materials" means any material, chemical, substance, waste, pollutant, contaminant, compound, mixture, or constituent thereof, in any form or amount, including petroleum (including crude oil or any fraction thereof) and petroleum products, natural gas liquids, asbestos and asbestos containing materials, naturally occurring radioactive materials, brine, and drilling mud, regulated or which can give rise to liability under any Environmental Law. "Release" means any spilling, leaking, seepage, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, disposing, depositing, dispersing, or migrating in, into or through the environment, or in, into from or through any building or structure.

(hh) *Compliance with ERISA*. (i) Each employee benefit plan, within the meaning of Section 3(3) of the Employee Retirement Income Security Act of 1974, as amended ("ERISA"), for which the Company or any member of its "Controlled Group" (defined as any organization which is a member of a controlled group of corporations within the meaning of Section 414 of the Code) would have any liability (each, a "Plan") has been maintained in compliance with its terms and the requirements of any applicable statutes, orders, rules and regulations, including but not limited to ERISA and the Code, except for noncompliance that would not reasonably be expected to result in material liability to the Company; (ii) no prohibited transaction, within the meaning of Section 406 of ERISA or Section 4975 of the Code, has occurred with respect to any Plan excluding transactions effected pursuant to a statutory or administrative exemption that could reasonably be expected to result in a material liability to the Company; (iii) for each Plan that is subject to the funding rules of Section 412 of the Code or Section 302 of ERISA, the minimum funding standard of Section 412 of the Code or Section 302 of ERISA, as applicable, has been satisfied (without taking into account any waiver thereof or extension of any amortization period) and is reasonably expected to be satisfied in the future (without taking into account any waiver thereof or extension of any amortization period); (iv) the fair market value of the assets of each Plan exceeds the present value of all benefits accrued under such Plan (determined based on those assumptions used to fund such Plan); (v) no "reportable event" (within the meaning of Section 4043(c) of ERISA) has occurred or is reasonably expected to occur that either has resulted, or could reasonably be expected to result, in material liability to the Company; (vi) neither the Company nor any member of the Controlled Group has incurred, nor reasonably expects to incur, any liability under Title IV of ERISA (other than contributions to the Plan or premiums to the PBGC, in the ordinary course and without default) in respect of a Plan (including a "multiemployer plan", within the meaning of Section 4001(a)(3) of ERISA); and (vii) there is no pending audit or investigation by the Internal Revenue Service, the U.S. Department of Labor, the Pension Benefit Guaranty Corporation or any other governmental agency or any foreign regulatory agency with respect to any Plan that could reasonably be expected to result in material liability to the Company. None of the following events has occurred or is reasonably likely to occur: (x) a material increase in the aggregate amount of contributions required to be made to all Plans by the Company in the current fiscal year of the Company compared to the amount of such contributions made in the Company's most recently completed fiscal year; or (y) a material increase in the Company's "accumulated post-retirement benefit obligations" (within the meaning of Statement of Financial Accounting Standards 106) compared to the amount of such obligations in the Company's most recently completed fiscal year.

(ii) *Disclosure Controls*. The Company maintains an effective system of "disclosure controls and procedures" (as defined in Rule 13a-15(e) of the Exchange Act) that complies with the requirements of the Exchange Act and that has been designed to ensure that information required to be disclosed by the Company in reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the Commission's rules and forms, including controls and procedures designed to ensure that such information is accumulated and communicated to the Company's management as appropriate to allow timely decisions regarding required disclosure.

(jj) *Accounting Controls*. The Company maintains systems of "internal control over financial reporting" (as defined in Rule 13a-15(f) of the Exchange Act) that are designed to comply with the requirements of the Exchange Act and have been designed by, or under the supervision of, its principal executive and principal financial officers, or persons performing similar functions, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP, including, but not limited to, internal accounting controls sufficient to provide reasonable assurance that (i) transactions are executed in accordance with management's general or specific authorizations; (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with GAAP and to maintain asset accountability; (iii) access to assets is permitted only in accordance with management's general or specific authorization; and (iv) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, there are no material weaknesses in the Company's internal controls. The Company's auditors and the Audit Committee of the Board of Directors of the Company have been advised of: (i) all significant deficiencies and material weaknesses, if any, in the design or operation of internal controls over financial reporting which have adversely affected or are reasonably likely to adversely affect the Company's ability to record, process, summarize and report financial information; and (ii) any fraud, whether or not material, that involves management or other employees who have a significant role in the Company's internal controls over financial reporting.

(kk) *Insurance*. The Company has insurance covering its properties, operations, personnel and businesses, including business interruption insurance, which insurance is in amounts and insures against such losses and risks as are generally maintained by companies engaged in the same or similar business and which the Company reasonably believes are adequate to protect the Company and its business; and the Company (i) has not received notice from any insurer or agent of such insurer that capital improvements or other expenditures are required or necessary to be made in order to continue such insurance or (ii) has no reason to believe that it will not be able to renew its existing insurance coverage as and when such coverage expires or to obtain similar coverage at reasonable cost from similar insurers as may be necessary to continue its business.

(ll) *No Unlawful Payments*. Neither the Company nor, to the knowledge of the Company, any director, officer, agent, employee or other person associated with or acting on behalf of the Company has (i) used any corporate funds for any unlawful contribution, gift, entertainment or other unlawful expense relating to political activity; (ii) made any direct or indirect unlawful payment to any foreign or domestic government official or employee from corporate funds; (iii) violated or is in violation of any provision of the Foreign Corrupt Practices Act of 1977; or (iv) made any bribe, rebate, payoff, influence payment, kickback or other unlawful payment. The Company and its affiliates have instituted and maintain and will continue to maintain policies and procedures designed to promote and achieve compliance with such laws and with the representation and warranty contained herein.

(mm) *Compliance with Money Laundering Laws*. The operations of the Company are and have been conducted at all times in compliance with applicable financial recordkeeping and reporting requirements of the Currency and Foreign Transactions Reporting Act of 1970, as amended, the money laundering statutes of all jurisdictions, the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any governmental agency (collectively, the "Money Laundering Laws") and no action, suit or proceeding by or before any court or governmental agency, authority or body or any arbitrator involving the Company with respect to the Money Laundering Laws is pending or, to the knowledge of the Company, threatened.

(nn) *Compliance with OFAC.* None of the Company or, to the knowledge of the Company, any director, officer, agent, employee or affiliate of the Company is, or is owned or controlled by a person that is currently, or at any time within the past five years was, (i) subject to any U.S. sanctions administered by the Office of Foreign Assets Control of the U.S. Department of the Treasury ("OFAC") or (ii) located, organized or resident in a country or territory that is subject of such sanctions; and the Company will not, directly or indirectly, use the proceeds of the offering of the Shares hereunder, or lend, contribute or otherwise make available such proceeds to any joint venture partner or other person or entity, for the purpose of financing the activities of any person currently subject to any U.S. sanctions administered by OFAC.

(oo) *No Broker's Fees*. The Company is not a party to any contract, agreement or understanding with any person (other than this Agreement) that would give rise to a valid claim against the Company or any Underwriter for a brokerage commission, finder's fee or like payment in connection with the offering and sale of the Shares.

(pp) *No Registration Rights*. Except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, no person has the right to require the Company to register any securities for sale under the Securities Act by reason of the filing of the Registration Statement with the Commission or the issuance and sale of the Shares.

(qq) *No Stabilization.* The Company has not taken, directly or indirectly, any action designed to or that would reasonably be expected to cause or result in any stabilization or manipulation of the price of the Shares.

(rr) *Margin Rules*. The application of the proceeds received by the Company from the issuance, sale and delivery of the Shares as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus will not violate Regulation T, U or X of the Board of Governors of the Federal Reserve System or any other regulation of such Board of Governors.

(ss) *Forward-Looking Statements*. No forward-looking statement (within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act) contained in the Registration Statement, the Pricing Disclosure Package or the Prospectus has been made or reaffirmed without a reasonable basis or has been disclosed other than in good faith.

(tt) *Statistical and Market Data*. Nothing has come to the attention of the Company that has caused the Company to believe that the statistical and market-related data included in the Registration Statement, the Pricing Disclosure Package and the Prospectus is not based on or derived from sources that are reliable and accurate in all material respects.

(uu) *Sarbanes-Oxley Act.* There is and has been no failure on the part of the Company or, to the knowledge of the Company, any of the Company's directors or officers, in their capacities as such, to comply with any applicable provision of the Sarbanes-Oxley Act of 2002 and the rules and regulations promulgated in connection therewith (the "Sarbanes-Oxley Act"), including Section 402 related to loans.

(vv) *Status under the Securities Act.* At the time of filing the Registration Statement and any post-effective amendment thereto, at the earliest time thereafter that the Company or any offering participant made a bona fide offer (within the meaning of Rule 164(h)(2) under the Securities Act) of the Shares and at the date hereof, the Company was not and is not an "ineligible issuer," as defined in Rule 405 under the Securities Act.

(ww) *No Rated Securities*. There are no debt securities or preferred stock of, or guaranteed by, the Company that are rated by a "nationally recognized statistical rating organization," as such term is defined by the Commission for the purposes of Section 3(a)(62) of the Exchange Act.

(xx) *Directed Share Program.* The Registration Statement, the Pricing Disclosure Package and the Prospectus, any Preliminary Prospectus and any Issuer Free Writing Prospectuses comply in all material respects, and any further amendments or supplements thereto, as of the date of such amendment or supplement, will comply in all material respects, with any applicable laws or regulations of foreign jurisdictions in which the Pricing Disclosure Package, the Prospectus, any Preliminary Prospectus and any Issuer Free Writing Prospectus, as amended or supplemented, if applicable, are distributed in connection with the Directed Share Program, and no authorization, approval, consent, license, order, registration or qualification of or with any government, governmental instrumentality or court, other than such as have been obtained or will be obtained or completed by the Closing Date, is necessary under the securities laws and regulations of foreign jurisdictions in which the Directed Shares are offered outside the United States. The Company has not offered, or caused the underwriters to offer, Shares to any person pursuant to the Directed Share Program with the specific intent to unlawfully influence (i) a customer or supplier of the Company to alter the customer or supplier's level or type of business with the Company, or (ii) a trade journalist or publication to write or publish favorable information about the Company or its products.

4. Further Agreements of the Company. The Company covenants and agrees with each Underwriter that:

(a) *Required Filings*. The Company will file the final Prospectus with the Commission within the time periods specified by Rule 424(b) and Rule 430A, 430B or 430C under the Securities Act, will file any Issuer Free Writing Prospectus to the extent required by Rule 433 under the Securities Act; and will furnish copies of the Prospectus and each Issuer Free Writing Prospectus (to the extent not previously delivered) to the Underwriters in New York City prior to 10:00 A.M., New York City time, on the business day next succeeding the date of this Agreement in such quantities as the Representatives may reasonably request.

(b) *Delivery of Copies.* The Company will deliver, without charge, (i) to the Representatives, three signed copies of the Registration Statement as originally filed and each amendment thereto, in each case including all exhibits and consents filed therewith; and (ii) to each Underwriter (A) a conformed copy of the Registration Statement as originally filed and each amendment thereto (without exhibits) and (B) during the Prospectus Delivery Period (as defined below), as many copies of the Prospectus (including all amendments and supplements thereto and

each Issuer Free Writing Prospectus) as the Representatives may reasonably request. As used herein, the term "Prospectus Delivery Period" means such period of time after the first date of the public offering of the Shares as in the opinion of counsel for the Underwriters a prospectus relating to the Shares is required by law to be delivered (or required to be delivered but for Rule 172 under the Securities Act) in connection with sales of the Shares by any Underwriter or dealer.

(c) *Amendments or Supplements, Issuer Free Writing Prospectuses*. Before preparing, using, authorizing, approving, referring to or filing any Issuer Free Writing Prospectus, and before filing any amendment or supplement to the Registration Statement or the Prospectus, the Company will furnish to the Representatives and counsel for the Underwriters a copy of the proposed Issuer Free Writing Prospectus, amendment or supplement for review and will not prepare, use, authorize, approve, refer to or file any such Issuer Free Writing Prospectus or file any such proposed amendment or supplement to which the Representatives reasonably object.

(d) *Notice to the Representatives*. The Company will advise the Representatives promptly, and confirm such advice in writing, (i) when the Registration Statement has become effective; (ii) when any amendment to the Registration Statement has been filed or becomes effective; (iii) when any supplement to the Prospectus, any Issuer Free Writing Prospectus, any Written Testing-the-Waters Communication or any amendment to the Prospectus has been filed or distributed; (iv) of any request by the Commission for any amendment to the Registration Statement or any amendment or supplement to the Prospectus or the receipt of any comments from the Commission relating to the Registration Statement or any other request by the Commission for any additional information including, but not limited to, any request for information concerning any Testing-the-Waters Communication; (v) of the issuance by the Commission of any order suspending the effectiveness of the Registration Statement or preventing or suspending the use of any Preliminary Prospectus, any of the Pricing Disclosure Package, the Prospectus or any Written Testing-the-Waters Communication or the initiation or threatening of any proceeding for that purpose or pursuant to Section 8A of the Securities Act; (vi) of the occurrence of any event or development within the Prospectus Delivery Period as a result of which the Prospectus, the Pricing Disclosure Package, any Issuer Free Writing Prospectus or any Written Testing-the-Waters Communication as then amended or supplemented would include any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances existing when the Prospectus, the Pricing Disclosure Package, any such Issuer Free Writing Prospectus or Written Testing-the-Waters Communication is delivered to a purchaser, not misleading; and (vii) of the receipt by the Company of any notice with respect to any suspension of the qualification of the Shares for offer and sale in any jurisdiction or the initiation or threatening of any proceeding for such purpose; and the Company will use its best efforts to prevent the issuance of any such order suspending the effectiveness of the Registration Statement, preventing or suspending the use of any Preliminary Prospectus, any of the Pricing Disclosure Package, the Prospectus or any Written Testing-the-Waters Communication or suspending any such qualification of the Shares and, if any such order is issued, will obtain as soon as possible the withdrawal thereof.

(e) *Ongoing Compliance*. (1) If during the Prospectus Delivery Period (i) any event or development shall occur or condition shall exist as a result of which the Prospectus as then amended or supplemented would include any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances existing when the Prospectus is delivered to a purchaser, not misleading or (ii) it is necessary to amend or supplement the Prospectus to comply with law, the Company will immediately notify the Underwriters thereof and forthwith prepare and, subject to paragraph (c) above, file with the Commission and furnish to the Underwriters and to such dealers as the

Representatives may designate such amendments or supplements to the Prospectus as may be necessary so that the statements in the Prospectus as so amended or supplemented will not, in the light of the circumstances existing when the Prospectus is delivered to a purchaser, be misleading or so that the Prospectus will comply with law and (2) if at any time prior to the Closing Date (i) any event or development shall occur or condition shall exist as a result of which the Pricing Disclosure Package as then amended or supplemented would include any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances existing when the Pricing Disclosure Package is delivered to a purchaser, not misleading or (ii) it is necessary to amend or supplement the Pricing Disclosure Package to comply with law, the Company will immediately notify the Underwriters thereof and forthwith prepare and, subject to paragraph (c) above, file with the Commission (to the extent required) and furnish to the Underwriters and to such dealers as the Representatives may designate such amendments or supplements to the Pricing Disclosure Package as may be necessary so that the statements in the Pricing Disclosure Package as so amended or supplemented will not, in the light of the circumstances existing when the Pricing Disclosure Package is delivered to a purchaser, be misleading or so that the Pricing Disclosure Package will comply with law.

(f) *Blue Sky Compliance*. The Company will qualify the Shares for offer and sale under the securities or Blue Sky laws of such jurisdictions as the Representatives shall reasonably request and will continue such qualifications in effect so long as required for distribution of the Shares; provided that the Company shall not be required to (i) qualify as a foreign corporation or other entity or as a dealer in securities in any such jurisdiction where it would not otherwise be required to so qualify, (ii) file any general consent to service of process in any such jurisdiction or (iii) subject itself to taxation in any such jurisdiction if it is not otherwise so subject.

(g) *Earning Statement*. The Company will make generally available to its security holders and the Representatives as soon as practicable an earnings statement that satisfies the provisions of Section 11(a) of the Securities Act and Rule 158 of the Commission promulgated thereunder covering a period of at least twelve months beginning with the first fiscal quarter of the Company occurring after the “effective date” (as defined in Rule 158) of the Registration Statement; provided that the Company will be deemed to have furnished such statements to its security holders and the Representatives to the extent they are filed on the Commission’s Electronic Data Gathering, Analysis and Retrieval system.

(h) *Clear Market*. For a period of 180 days after the date of the Prospectus, the Company will not (i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, or file with the Commission a registration statement under the Securities Act relating to, any shares of Stock or any securities convertible into or exercisable or exchangeable for Stock, or publicly disclose the intention to make any offer, sale, pledge, disposition or filing, or (ii) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of the Stock or any such other securities, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Stock or such other securities, in cash or otherwise, without the prior written consent of J. P. Morgan Securities LLC and Morgan Stanley & Co. LLC, other than (A) the Shares to be sold hereunder, (B) any shares of Stock of the Company issued upon the exercise of options granted under Company Stock Plans or warrants described as outstanding in the Registration Statement, the Pricing Disclosure Package and the Prospectus, (C) any options and other awards granted under a Company Stock Plan described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, (D) the filing by the Company of any registration

statement on Form S-8 or a successor form thereto relating to a Company Stock Plan described in the Registration Statement, the Pricing Disclosure Package and the Prospectus and (E) shares of Stock or other securities issued in connection with a transaction with an unaffiliated third party that includes a bona fide commercial relationship (including joint ventures, marketing or distribution arrangements, collaboration agreements or intellectual property license agreements) or any acquisition of assets or acquisition of not less than a majority or controlling portion of the equity of another entity, provided that (x) the aggregate number of shares issued pursuant to this clause (E) shall not exceed five percent (5%) of the total number of outstanding shares of Stock immediately following the issuance and sale of the Underwritten Shares pursuant hereto and (y) the recipient of any such shares of Stock and securities issued pursuant to this clause (E) during the 180-day restricted period described above shall enter into an agreement substantially in the form of Exhibit A hereto.

If J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC, in their sole discretion, agree to release or waive the restrictions set forth in a lock-up letter described in Section 6(l) hereof for an officer or director of the Company and provide the Company with notice of the impending release or waiver at least three business days before the effective date of the release or waiver, the Company agrees to announce the impending release or waiver by a press release substantially in the form of Exhibit C hereto through a major news service at least two business days before the effective date of the release or waiver.

(i) *Use of Proceeds*. The Company will apply the net proceeds from the sale of the Shares in all material respects as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus under the heading "Use of Proceeds".

(j) *No Stabilization.* The Company will not take, directly or indirectly, without giving effect to activities by the Underwriters, any action designed to or that would reasonably be expected to cause or result in any stabilization or manipulation of the price of the Stock.

(k) *Reports*. For the period of two years from the date of this Agreement, the Company will furnish to the Representatives, as soon as they are available, copies of all reports or other communications (financial or other) furnished to holders of the Shares, and copies of any reports and financial statements furnished to or filed with the Commission or any national securities exchange or automatic quotation system; provided the Company will be deemed to have furnished such reports and financial statements to the Representatives to the extent they are filed on the Commission's Electronic Data Gathering, Analysis, and Retrieval system.

(l) *Record Retention*. The Company will, pursuant to reasonable procedures developed in good faith, retain copies of each Issuer Free Writing Prospectus that is not filed with the Commission in accordance with Rule 433 under the Securities Act.

(m) *Filings*. The Company will file with the Commission such reports as may be required by Rule 463 under the Securities Act.

(n) *Directed Share Program.* The Company will comply with all applicable securities and other laws, rules and regulations in each jurisdiction in which the Directed Shares are offered in connection with the Directed Share Program.

(o) *Emerging Growth Company*. The Company will promptly notify the Representatives if the Company ceases to be an Emerging Growth Company at any time prior to the later of (i) completion of the distribution of Shares within the meaning of the Securities Act and (ii) completion of the 180-day restricted period referred to in Section 4(h) hereof.

5. Certain Agreements of the Underwriters. Each Underwriter hereby represents and agrees that:

(a) It has not used, authorized use of, referred to or participated in the planning for use of, and will not use, authorize use of, refer to or participate in the planning for use of, any "free writing prospectus", as defined in Rule 405 under the Securities Act (which term includes use of any written information furnished to the Commission by the Company and not incorporated by reference into the Registration Statement and any press release issued by the Company) other than (i) a free writing prospectus that contains no "issuer information" (as defined in Rule 433(h)(2) under the Securities Act) that was not included (including through incorporation by reference) in the Preliminary Prospectus or a previously filed Issuer Free Writing Prospectus, (ii) any Issuer Free Writing Prospectus listed on Annex B or prepared pursuant to Section 3(c) or Section 4(c) above (including any electronic road show), or (iii) any free writing prospectus prepared by such underwriter and approved by the Company in advance in writing (each such free writing prospectus referred to in clauses (i) or (iii), an "Underwriter Free Writing Prospectus").

(b) It has not and will not, without the prior written consent of the Company, use any free writing prospectus that contains the final terms of the Shares unless such terms have previously been included in a free writing prospectus filed with the Commission; *provided* that Underwriters may use a term sheet substantially in the form of Annex D hereto without the consent of the Company; *provided further* that any Underwriter using such term sheet shall notify the Company, and provide a copy of such term sheet to the Company, prior to the first use of such term sheet.

(c) It is not subject to any pending proceeding under Section 8A of the Securities Act with respect to the offering (and will promptly notify the Company if any such proceeding against it is initiated during the Prospectus Delivery Period).

6. Conditions of Underwriters' Obligations. The obligation of each Underwriter to purchase the Underwritten Shares on the Closing Date or the Option Shares on the Additional Closing Date, as the case may be, as provided herein is subject to the performance by the Company of its covenants and other obligations hereunder and to the following additional conditions:

(a) *Registration Compliance; No Stop Order*. No order suspending the effectiveness of the Registration Statement shall be in effect, and no proceeding for such purpose or pursuant to Section 8A under the Securities Act shall be pending before or threatened by the Commission; the Prospectus and each Issuer Free Writing Prospectus shall have been timely filed with the Commission under the Securities Act (in the case of an Issuer Free Writing Prospectus, to the extent required by Rule 433 under the Securities Act) and in accordance with Section 4(a) hereof; and all requests by the Commission for additional information shall have been complied with to the reasonable satisfaction of the Representatives.

(b) *Representations and Warranties*. The representations and warranties of the Company contained herein shall be true and correct on the date hereof and on and as of the Closing Date or the Additional Closing Date, as the case may be; and the statements of the Company and its officers made in any certificates delivered pursuant to this Agreement shall be true and correct on and as of the Closing Date or the Additional Closing Date, as the case may be.

(c) *No Material Adverse Change*. No event or condition of a type described in Section 3(h) hereof shall have occurred or shall exist, which event or condition is not described in the Pricing Disclosure Package (excluding any amendment or supplement thereto) and the Prospectus (excluding any amendment or supplement thereto) and the effect of which in the judgment of the Representatives makes it impracticable or inadvisable to proceed with the offering, sale or delivery of the Shares on the Closing Date or the Additional Closing Date, as the case may be, on the terms and in the manner contemplated by this Agreement, the Pricing Disclosure Package and the Prospectus.

(d) *Officer's Certificate*. The Representatives shall have received on and as of the Closing Date or the Additional Closing Date, as the case may be, a certificate of the chief financial officer or chief accounting officer of the Company and one additional senior executive officer of the Company who is satisfactory to the Representatives (i) confirming that such officers have carefully reviewed the Registration Statement, the Pricing Disclosure Package and the Prospectus and, to the knowledge of such officers, the representations set forth in Sections 3(b) and 3(c) hereof are true and correct, (ii) confirming that the other representations and warranties of the Company in this Agreement are true and correct and that the Company has complied with all agreements and satisfied all conditions on its part to be performed or satisfied hereunder at or prior to the Closing Date or the Additional Closing Date, as the case may be, and (iii) to the effect set forth in paragraphs (a) and (c) above.

(e) *Comfort Letters*. On the date of this Agreement and on the Closing Date or the Additional Closing Date, as the case may be, Ernst & Young LLP shall have furnished to the Representatives, at the request of the Company, letters, dated the respective dates of delivery thereof and addressed to the Underwriters, in form and substance reasonably satisfactory to the Representatives, containing statements and information of the type customarily included in accountants' "comfort letters" to underwriters with respect to the financial statements and certain financial information contained in the Registration Statement, the Pricing Disclosure Package and the Prospectus; provided, that the letter delivered on the Closing Date or the Additional Closing Date, as the case may be, shall use a "cut-off" date no more than three business days prior to such Closing Date or such Additional Closing Date, as the case may be.

(f) *Opinion and 10b-5 Statement of Counsel for the Company*. Ropes & Gray LLP, counsel for the Company, shall have furnished to the Representatives, at the request of the Company, their written opinion and 10b-5 statement, dated the Closing Date or the Additional Closing Date, as the case may be, and addressed to the Underwriters, in form and substance reasonably satisfactory to the Representatives, to the effect set forth in Annex A-1 hereto.

(g) *Opinion of Intellectual Property Counsel for the Company*. Cooley, LLP, intellectual property counsel for the Company, shall have furnished to the Representatives, at the request of the Company, its written opinion, dated the Closing Date or the Additional Closing Date, as the case may be, and addressed to the Underwriters, in form and substance reasonably satisfactory to the Representatives, to the effect set forth in Annex A-2 hereto.

(h) *Opinion and 10b-5 Statement of Counsel for the Underwriters*. The Representatives shall have received on and as of the Closing Date or the Additional Closing Date, as the case may be, an opinion and 10b-5 statement of Latham & Watkins LLP, counsel for the Underwriters, with respect to such matters as the Representatives may reasonably request, and such counsel shall have received such documents and information as they may reasonably request to enable them to pass upon such matters.

(i) *No Legal Impediment to Issuance*. No action shall have been taken and no statute, rule, regulation or order shall have been enacted, adopted or issued by any federal, state or foreign governmental or regulatory authority that would, as of the Closing Date or the Additional Closing Date, as the case may be, prevent the issuance or sale of the Shares; and no injunction or order of any federal, state or foreign court shall have been issued that would, as of the Closing Date or the Additional Closing Date, as the case may be, prevent the issuance or sale of the Shares.

(j) *Good Standing*. The Representatives shall have received on and as of the Closing Date or the Additional Closing Date, as the case may be, satisfactory evidence of the good standing of the Company in its jurisdiction of organization and its good standing as a foreign entity in such other jurisdictions as the Representatives may reasonably request, in each case in writing or any standard form of telecommunication from the appropriate governmental authorities of such jurisdictions.

(k) *Exchange Listing*. The Shares to be delivered on the Closing Date or Additional Closing Date, as the case may be, shall have been approved for listing on the NASDAQ Global Market, subject to official notice of issuance.

(l) *Lock-up Agreements*. The "lock-up" agreements, each substantially in the form of Exhibit A hereto, between you and all of the shareholders, officers and directors of the Company (other than those identified on Exhibit D) relating to sales and certain other dispositions of shares of Stock or certain other securities, delivered to you on or before the date hereof, shall be full force and effect on the Closing Date or Additional Closing Date, as the case may be.

(m) *Additional Documents*. On or prior to the Closing Date or the Additional Closing Date, as the case may be, the Company shall have furnished to the Representatives such further certificates and documents as the Representatives may reasonably request.

All opinions, letters, certificates and evidence mentioned above or elsewhere in this Agreement shall be deemed to be in compliance with the provisions hereof only if they are in form and substance reasonably satisfactory to counsel for the Underwriters.

7. Indemnification and Contribution.

(a) *Indemnification of the Underwriters.* The Company agrees to indemnify and hold harmless each Underwriter, its affiliates, directors and officers and each person, if any, who controls such Underwriter within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act, from and against any and all losses, claims, damages and liabilities (including, without limitation, legal fees and other expenses incurred in connection with any suit, action or proceeding or any claim asserted, as such fees and expenses are incurred), joint or several, that arise out of, or are based upon, (i) any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement or caused by any omission or alleged omission to state therein a material fact required to be stated therein or necessary in order to make the statements therein, not misleading, or (ii) any untrue statement or alleged untrue statement of a material fact contained in the Prospectus (or any amendment or supplement thereto), any Issuer Free Writing Prospectus, any "issuer information" filed or required to be filed pursuant to Rule 433(d) under the Securities Act, any Written Testing-the-Waters Communication, any road show as defined in Rule 433(h) under the Securities Act (a "road show") or any Pricing Disclosure Package (including any Pricing Disclosure Package that has subsequently been amended), or caused by any omission or alleged omission to state therein a material fact necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading, in each case except

insofar as such losses, claims, damages or liabilities arise out of, or are based upon, any untrue statement or omission or alleged untrue statement or omission made in reliance upon and in conformity with any information relating to any Underwriter furnished to the Company in writing by such Underwriter through the Representatives expressly for use therein, it being understood and agreed that the only such information furnished by any Underwriter consists of the information described as such in subsection (b) below.

(b) *Indemnification of the Company*. Each Underwriter agrees, severally and not jointly, to indemnify and hold harmless the Company, its directors, its officers who signed the Registration Statement and each person, if any, who controls the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act to the same extent as the indemnity set forth in paragraph (a) above, but only with respect to any losses, claims, damages or liabilities that arise out of, or are based upon, any untrue statement or omission or alleged untrue statement or omission made in reliance upon and in conformity with any information relating to such Underwriter furnished to the Company in writing by such Underwriter through the Representatives expressly for use in the Registration Statement, the Prospectus (or any amendment or supplement thereto), any Issuer Free Writing Prospectus, any Written Testing-the-Waters Communication, any road show or any Pricing Disclosure Package (including any Pricing Disclosure Package that has subsequently been amended), it being understood and agreed upon that the only such information furnished by any Underwriter consists of the following information in the Prospectus furnished on behalf of each Underwriter: the concession and reallowance figures appearing in the paragraph under the caption "Underwriting" and the information contained in the paragraph under the caption "Underwriting".

(c) *Notice and Procedures.* If any suit, action, proceeding (including any governmental or regulatory investigation), claim or demand shall be brought or asserted against any person in respect of which indemnification may be sought pursuant to either paragraph (a) or (b) above, such person (the "Indemnified Person") shall promptly notify the person against whom such indemnification may be sought (the "Indemnifying Person") in writing; provided that the failure to notify the Indemnifying Person shall not relieve it from any liability that it may have under paragraph (a) or (b) above except to the extent that it has been materially prejudiced (through the forfeiture of substantive rights or defenses) by such failure; and provided, further, that the failure to notify the Indemnifying Person shall not relieve it from any liability that it may have to an Indemnified Person otherwise than under paragraph (a) or (b) above. If any such proceeding shall be brought or asserted against an Indemnified Person and it shall have notified the Indemnifying Person thereof, the Indemnifying Person shall retain counsel reasonably satisfactory to the Indemnified Person (who shall not, without the consent of the Indemnified Person, be counsel to the Indemnifying Person) to represent the Indemnified Person in such proceeding and shall pay the fees and expenses of such counsel related to such proceeding, as incurred. In any such proceeding, any Indemnified Person shall have the right to retain its own counsel, but the fees and expenses of such counsel shall be at the expense of such Indemnified Person unless (i) the Indemnifying Person and the Indemnified Person shall have mutually agreed to the contrary; (ii) the Indemnifying Person has failed within a reasonable time to retain counsel reasonably satisfactory to the Indemnified Person; (iii) the Indemnified Person shall have reasonably concluded that there may be legal defenses available to it that are different from or in addition to those available to the Indemnifying Person; or (iv) the named parties in any such proceeding (including any impleaded parties) include both the Indemnifying Person and the Indemnified Person and representation of both parties by the same counsel would be inappropriate due to actual or potential differing interest between them. It is understood and agreed that the Indemnifying Person shall not, in connection with any proceeding or related proceedings in the same jurisdiction, be liable for the fees and expenses of more than one separate firm (in addition to any local counsel) for all Indemnified Persons, and that all such fees and expenses shall be paid or reimbursed as they are incurred. Any such separate firm for any Underwriter, its affiliates, directors and officers and any control persons of such Underwriter shall be designated in writing by the Representatives and any such separate firm for

the Company, its directors, its officers who signed the Registration Statement and any control persons of the Company shall be designated in writing by the Company. The Indemnifying Person shall not be liable for any settlement of any proceeding effected without its written consent, but if settled with such consent or if there be a final judgment for the plaintiff, the Indemnifying Person agrees to indemnify each Indemnified Person from and against any loss or liability by reason of such settlement or judgment. Notwithstanding the foregoing sentence, if at any time an Indemnified Person shall have requested that an Indemnifying Person reimburse the Indemnified Person for fees and expenses of counsel as contemplated by this paragraph, the Indemnifying Person shall be liable for any settlement of any proceeding effected without its written consent if (i) such settlement is entered into more than 30 days after receipt by the Indemnifying Person of such request and (ii) the Indemnifying Person shall not have reimbursed the Indemnified Person in accordance with such request prior to the date of such settlement. No Indemnifying Person shall, without the written consent of the Indemnified Person, effect any settlement of any pending or threatened proceeding in respect of which any Indemnified Person is or could have been a party and indemnification could have been sought hereunder by such Indemnified Person, unless such settlement (x) includes an unconditional release of such Indemnified Person, in form and substance reasonably satisfactory to such Indemnified Person, from all liability on claims that are the subject matter of such proceeding and (y) does not include any statement as to or any admission of fault, culpability or a failure to act by or on behalf of any Indemnified Person.

(d) *Contribution*. If the indemnification provided for in paragraphs (a) and (b) above is unavailable to an Indemnified Person or insufficient in respect of any losses, claims, damages or liabilities referred to therein, then each Indemnifying Person under such paragraph, in lieu of indemnifying such Indemnified Person thereunder, shall contribute to the amount paid or payable by such Indemnified Person as a result of such losses, claims, damages or liabilities (i) in such proportion as is appropriate to reflect the relative benefits received by the Company, on the one hand, and the Underwriters on the other, from the offering of the Shares or (ii) if the allocation provided by clause (i) is not permitted by applicable law, in such proportion as is appropriate to reflect not only the relative benefits referred to in clause (i) but also the relative fault of the Company, on the one hand, and the Underwriters on the other, in connection with the statements or omissions that resulted in such losses, claims, damages or liabilities, as well as any other relevant equitable considerations. The relative benefits received by the Company, on the one hand, and the Underwriters on the other, shall be deemed to be in the same respective proportions as the net proceeds (before deducting expenses) received by the Company from the sale of the Shares and the total underwriting discounts and commissions received by the Underwriters in connection therewith, in each case as set forth in the table on the cover of the Prospectus, bear to the aggregate offering price of the Shares. The relative fault of the Company, on the one hand, and the Underwriters on the other, shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the Company or by the Underwriters and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission.

(e) *Limitation on Liability*. The Company and the Underwriters agree that it would not be just and equitable if contribution pursuant to paragraph (d) above were determined by pro rata allocation (even if the Underwriters were treated as one entity for such purpose) or by any other method of allocation that does not take account of the equitable considerations referred to in paragraph (d) above. The amount paid or payable by an Indemnified Person as a result of the losses, claims, damages and liabilities referred to in paragraph (d) above shall be deemed to include, subject to the limitations set forth above, any legal or other expenses incurred by such Indemnified Person in connection with any such action or claim. Notwithstanding the provisions of paragraphs (d) and (e), in no event shall an Underwriter be required to contribute any amount in excess of the amount by which the total underwriting discounts and commissions received by such Underwriter with respect to the offering of the Shares exceeds the amount of any damages that such Underwriter has otherwise been required to pay by reason

of such untrue or alleged untrue statement or omission or alleged omission. No person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. The Underwriters' obligations to contribute pursuant to paragraphs (d) and (e) are several in proportion to their respective purchase obligations hereunder and not joint.

(f) *Non-Exclusive Remedies*. The remedies provided for in this Section 7 are not exclusive and shall not limit any rights or remedies which may otherwise be available to any Indemnified Person at law or in equity.

(g) *Directed Share Program Indemnification.* The Company agrees to indemnify and hold harmless J.P. Morgan Securities LLC, its affiliates, directors and officers and each person, if any, who controls J.P. Morgan Securities LLC within the meaning of either Section 15 of the Securities Act or Section 20 of the Exchange Act (each a "J.P. Morgan Securities LLC Entity") from and against any and all losses, claims, damages and liabilities (including, without limitation, reasonably incurred and documented legal fees and other expenses incurred in connection with defending or investigating any suit, action or proceeding or any claim asserted, as such fees and expenses are incurred) (i) caused by any untrue statement or alleged untrue statement of a material fact contained in any material prepared by or with the consent of the Company for distribution to Participants in connection with the Directed Share Program or caused by any omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading; (ii) caused by the failure of any Participant to pay for and accept delivery of Directed Shares that the Participant agreed to purchase; or (iii) related to, arising out of, or in connection with the Directed Share Program, other than losses, claims, damages or liabilities (or expenses relating thereto) that are finally judicially determined to have resulted from the bad faith or gross negligence of the J.P. Morgan Securities LLC Entities.

(h) In case any proceeding (including any governmental investigation) shall be instituted involving any J.P. Morgan Securities LLC Entity in respect of which indemnity may be sought pursuant to paragraph (g) above, the J.P. Morgan Securities LLC Entity seeking indemnity shall promptly notify the Company in writing and the Company, upon request of the J.P. Morgan Securities LLC Entity, shall retain counsel reasonably satisfactory to the J.P. Morgan Securities LLC Entity to represent the J.P. Morgan Securities LLC Entity and any others the Company may designate in such proceeding and shall pay the reasonably incurred and documented fees and disbursements of such counsel related to such proceeding. In any such proceeding, any J.P. Morgan Securities LLC Entity shall have the right to retain its own counsel, but all fees and expenses of such counsel shall be at the expense of such J.P. Morgan Securities LLC Entity unless (i) the Company and such J.P. Morgan Securities LLC Entity shall have mutually agreed to the retention of such counsel, (ii) the Company has failed within a reasonable time to retain counsel reasonably satisfactory to such J.P. Morgan Securities LLC Entity, (iii) the J.P. Morgan Securities LLC Entity shall have reasonably concluded upon the advice of counsel that there may be legal defenses available to it that are different from or in addition to those available to the Company or (iv) the named parties to any such proceeding (including any impleaded parties) include both the Company and the J.P. Morgan Securities LLC Entity and representation of both parties by the same counsel would be inappropriate due to actual or potential differing interests between them. The Company shall not, in respect of the legal expenses of the J.P. Morgan Securities LLC Entities in connection with any proceeding or related proceedings in the same jurisdiction, be liable for the fees and expenses of more than one separate firm (in addition to any local counsel) for all J.P. Morgan Securities LLC Entities. The Company shall not be liable for any settlement of any proceeding effected without its written consent, but if settled with such consent or if there be a final judgment for the plaintiff, the Company agrees to indemnify the J.P. Morgan Securities LLC Entities from and against any loss or liability by reason of such settlement or judgment. Notwithstanding the foregoing sentence, if at any time any J.P. Morgan

Securities LLC Entity shall have requested the Company to reimburse such J.P. Morgan Securities LLC Entity for fees and expenses of counsel as contemplated by the second and third sentences of this paragraph, the Company agrees that it shall be liable for any settlement of any proceeding effected without its written consent if (i) such settlement is entered into more than 30 days after receipt by the Company of the aforesaid request and (ii) the Company shall not have reimbursed such J.P. Morgan Securities LLC Entity in accordance with such request prior to the date of such settlement. The Company shall not, without the prior written consent of J.P. Morgan Securities LLC, effect any settlement of any pending or threatened proceeding in respect of which any J.P. Morgan Securities LLC Entity is or could have been a party and indemnity could have been sought hereunder by such J.P. Morgan Securities LLC Entity, unless (x) such settlement includes an unconditional release of the J.P. Morgan Securities LLC Entities from all liability on claims that are the subject matter of such proceeding and (y) does not include any statement as to or any admission of fault, culpability or a failure to act by or on behalf of the J.P. Morgan Securities Entity.

(i) To the extent the indemnification provided for in paragraph (g) above is unavailable to a J.P. Morgan Securities LLC Entity or insufficient in respect of any losses, claims, damages or liabilities referred to therein (other than as a result of the limitations imposed on indemnification described in paragraph (g) above), then the Company in lieu of indemnifying the J.P. Morgan Securities LLC Entity thereunder, shall contribute to the amount paid or payable by the J.P. Morgan Securities LLC Entity as a result of such losses, claims, damages or liabilities (1) in such proportion as is appropriate to reflect the relative benefits received by the Company on the one hand and the J.P. Morgan Securities LLC Entities on the other hand from the offering of the Directed Shares or (2) if the allocation provided by clause 7(i)(1) above is not permitted by applicable law, in such proportion as is appropriate to reflect not only the relative benefits referred to in clause 7(i)(1) above but also the relative fault of the Company on the one hand and of the J.P. Morgan Securities LLC Entities on the other hand in connection with any statements or omissions that resulted in such losses, claims, damages or liabilities, as well as any other relevant equitable considerations. The relative benefits received by the Company on the one hand and the J.P. Morgan Securities LLC Entities on the other hand in connection with the offering of the Directed Shares shall be deemed to be in the same respective proportions as the net proceeds from the offering of the Directed Shares (before deducting expenses) and the total underwriting discounts and commissions received by the J.P. Morgan Securities LLC Entities for the Directed Shares, bear to the aggregate public offering price of the Directed Shares. If the loss, claim, damage or liability is caused by an untrue or alleged untrue statement of material fact or the omission or alleged omission to state a material fact, the relative fault of the Company on the one hand and the J.P. Morgan Securities LLC Entities on the other hand shall be determined by reference to, among other things, whether the untrue or alleged untrue statement or the omission or alleged omission relates to information supplied by the Company or by the J.P. Morgan Securities LLC Entities and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission.

(j) The Company and the J.P. Morgan Securities LLC Entities agree that it would be not just or equitable if contribution pursuant to paragraph (i) above were determined by pro rata allocation (even if the J.P. Morgan Securities LLC Entities were treated as one entity for such purpose) or by any other method of allocation that does not take account of the equitable considerations referred to in paragraph (i) above. The amount paid or payable by the J.P. Morgan Securities LLC Entities as a result of the losses, claims, damages and liabilities referred to in the immediately preceding paragraph shall be deemed to include, subject to the limitations set forth above, any legal or other expenses reasonably incurred by the J.P. Morgan Securities LLC Entities in connection with investigating or defending such any action or claim. Notwithstanding the provisions of paragraph (i) above, no J.P. Morgan Securities LLC Entity shall be required to contribute any amount in excess of the amount by which the total price at which the Directed Shares distributed to the public were offered to the public exceeds the amount of any damages that such J.P. Morgan Securities LLC Entity has otherwise been required to pay. No person guilty of

fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. The remedies provided for in paragraphs (g) through (j) are not exclusive and shall not limit any rights or remedies which may otherwise be available to any indemnified party at law or in equity.

(k) The indemnity and contribution provisions contained in paragraphs (g) through (j) shall remain operative and in full force and effect regardless of (i) any termination of this Agreement, (ii) any investigation made by or on behalf of any J.P. Morgan Securities LLC Entity or the Company, its officers or directors or any person controlling the Company and (iii) acceptance of and payment for any of the Directed Shares.

8. Effectiveness of Agreement. This Agreement shall become effective upon the execution and delivery hereof by the parties hereto.

9. Termination. This Agreement may be terminated in the absolute discretion of the Representatives, by notice to the Company, if after the execution and delivery of this Agreement and prior to the Closing Date or, in the case of the Option Shares, prior to the Additional Closing Date (i) trading generally shall have been suspended or materially limited on or by any of the New York Stock Exchange, the American Stock Exchange, the NASDAQ Stock Market, the Chicago Board Options Exchange, the Chicago Mercantile Exchange or the Chicago Board of Trade; (ii) trading of any securities issued or guaranteed by the Company shall have been suspended on any exchange or in any over-the-counter market; (iii) a general moratorium on commercial banking activities shall have been declared by federal or New York State authorities; (iv) there shall have occurred any major disruption of settlements of securities, payment, or clearance services in the United States or any other country where such securities are listed; or (v) there shall have occurred any outbreak or escalation of hostilities or declaration by the United States of a national emergency or war or any change in financial markets or any calamity or crisis, either within or outside the United States, that, in the judgment of the Representatives, is material and adverse and makes it impracticable or inadvisable to proceed with the offering, sale or delivery of the Shares on the Closing Date or the Additional Closing Date, as the case may be, on the terms and in the manner contemplated by this Agreement, the Pricing Disclosure Package and the Prospectus.

10. Defaulting Underwriter.

(a) If, on the Closing Date or the Additional Closing Date, as the case may be, any Underwriter defaults on its obligation to purchase the Shares that it has agreed to purchase hereunder on such date, the non-defaulting Underwriters may in their discretion arrange for the purchase of such Shares by other persons satisfactory to the Company on the terms contained in this Agreement. If, within 36 hours after any such default by any Underwriter, the non-defaulting Underwriters do not arrange for the purchase of such Shares, then the Company shall be entitled to a further period of 36 hours within which to procure other persons satisfactory to the non-defaulting Underwriters to purchase such Shares on such terms. If other persons become obligated or agree to purchase the Shares of a defaulting Underwriter, either the non-defaulting Underwriters or the Company may postpone the Closing Date or the Additional Closing Date, as the case may be, for up to five full business days in order to effect any changes that in the opinion of counsel for the Company or counsel for the Underwriters may be necessary in the Registration Statement and the Prospectus or in any other document or arrangement, and the Company agrees to promptly prepare any amendment or supplement to the Registration Statement and the Prospectus that effects any such changes. As used in this Agreement, the term “Underwriter” includes, for all purposes of this Agreement unless the context otherwise requires, any person not listed in Schedule 1 hereto that, pursuant to this Section 10, purchases Shares that a defaulting Underwriter agreed but failed to purchase.

(b) If, after giving effect to any arrangements for the purchase of the Shares of a defaulting Underwriter or Underwriters by the non-defaulting Underwriters and the Company as provided in paragraph (a) above, the aggregate number of Shares that remain unpurchased on the Closing Date or the Additional Closing Date, as the case may be, does not exceed one-eleventh of the aggregate number of Shares to be purchased on such date, then the Company shall have the right to require each non-defaulting Underwriter to purchase the number of Shares that such Underwriter agreed to purchase hereunder on such date plus such Underwriter's pro rata share (based on the number of Shares that such Underwriter agreed to purchase on such date) of the Shares of such defaulting Underwriter or Underwriters for which such arrangements have not been made.

(c) If, after giving effect to any arrangements for the purchase of the Shares of a defaulting Underwriter or Underwriters by the non-defaulting Underwriters and the Company as provided in paragraph (a) above, the aggregate number of Shares that remain unpurchased on the Closing Date or the Additional Closing Date, as the case may be, exceeds one-eleventh of the aggregate amount of Shares to be purchased on such date, or if the Company shall not exercise the right described in paragraph (b) above, then this Agreement or, with respect to any Additional Closing Date, the obligation of the Underwriters to purchase Shares on the Additional Closing Date shall terminate without liability on the part of the non-defaulting Underwriters. Any termination of this Agreement pursuant to this Section 10 shall be without liability on the part of the Company, except that the Company will continue to be liable for the payment of expenses as set forth in Section 11 hereof and except that the provisions of Section 7 hereof shall not terminate and shall remain in effect.

(d) Nothing contained herein shall relieve a defaulting Underwriter of any liability it may have to the Company or any non-defaulting Underwriter for damages caused by its default.

11. Payment of Expenses.

(a) Whether or not the transactions contemplated by this Agreement are consummated or this Agreement is terminated, the Company will pay or cause to be paid all costs and expenses incident to the performance of its obligations hereunder, including without limitation, (i) the costs incident to the authorization, issuance, sale, preparation and delivery of the Shares and any taxes payable in that connection; (ii) the costs incident to the preparation, printing and filing under the Securities Act of the Registration Statement, the Preliminary Prospectus, any Issuer Free Writing Prospectus, any Pricing Disclosure Package and the Prospectus (including all exhibits, amendments and supplements thereto) and the distribution thereof; (iii) the fees and expenses of the Company's counsel and independent accountants; (iv) the fees and expenses incurred in connection with the registration or qualification and determination of eligibility for investment of the Shares under the state or foreign securities or blue sky laws of such jurisdictions as the Representatives may designate and the preparation, printing and distribution of a Blue Sky Memorandum and any "Canadian Wrapper" (including the related fees and expenses of counsel for the Underwriters in an amount not to exceed $7,500); (v) the cost of preparing stock certificates; (vi) the costs and charges of any transfer agent and any registrar; (vii) all expenses and application fees incurred in connection with any filing with, and clearance of the offering by, FINRA (including the related fees and expenses of counsel for the Underwriters in an amount not to exceed $25,000); (viii) all expenses incurred by the Company in connection with any "road show" presentation to potential investors, it being understood and agreed that except as provided in this Section 11 or Section 7 hereof, the Underwriters will pay all of the travel, lodging and other expenses of the Underwriters or any of their employees incurred by them in connection with the "road show" (provided that the Underwriters and the Company shall each pay 50% of the cost of any aircraft or other transportation chartered in connection with the "road show"); (ix) all expenses and application fees related to the listing of the Shares on the NASDAQ Global Market and (x) all of the reasonably incurred and documented fees and disbursements of counsel incurred by the Underwriters in connection with the Directed Share Program and stamp duties, similar taxes or duties or other taxes, if any, incurred by the Underwriters in connection with the Directed Share Program.

(b) If (i) this Agreement is terminated pursuant to Section 9, (ii) the Company for any reason fails to tender the Shares for delivery to the Underwriters or (iii) the Underwriters decline to purchase the Shares for any reason permitted under this Agreement, the Company agrees to reimburse the Underwriters for all out-of-pocket costs and expenses (including the fees and expenses of their counsel) reasonably incurred by the Underwriters in connection with this Agreement and the offering contemplated hereby. For the avoidance of doubt, it is understood that the Company shall not pay or reimburse any costs, fees or expenses incurred by an Underwriter that defaults on its obligations to purchase the Shares.

12. Persons Entitled to Benefit of Agreement. This Agreement shall inure to the benefit of and be binding upon the parties hereto and their respective successors and the officers and directors and any controlling persons referred to in Section 7 hereof. Nothing in this Agreement is intended or shall be construed to give any other person any legal or equitable right, remedy or claim under or in respect of this Agreement or any provision contained herein. No purchaser of Shares from any Underwriter shall be deemed to be a successor merely by reason of such purchase.

13. Survival. The respective indemnities, rights of contribution, representations, warranties and agreements of the Company and the Underwriters contained in this Agreement or made by or on behalf of the Company or the Underwriters pursuant to this Agreement or any certificate delivered pursuant hereto shall survive the delivery of and payment for the Shares and shall remain in full force and effect, regardless of any termination of this Agreement or any investigation made by or on behalf of the Company or the Underwriters.

14. Certain Defined Terms. For purposes of this Agreement, (a) except where otherwise expressly provided, the term “affiliate” has the meaning set forth in Rule 405 under the Securities Act; and (b) the term “business day” means any day other than a day on which banks are permitted or required to be closed in New York City.

15. Miscellaneous.

(a) *Authority of J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC.* Any action by the Underwriters hereunder may be taken by J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC on behalf of the Underwriters, and any such action taken by J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC shall be binding upon the Underwriters.

(b) *Notices*. All notices and other communications hereunder shall be in writing and shall be deemed to have been duly given if mailed or transmitted and confirmed by any standard form of telecommunication. Notices to the Underwriters shall be given to the Representatives c/o J. P. Morgan Securities LLC, 383 Madison Avenue, New York, New York 10179 (fax: (212) 622-8358); Attention Equity Syndicate Desk and c/o Morgan Stanley & Co. LLC, 1585 Broadway, New York, New York 10036; Attention Equity Syndicate Desk, with a copy to the Legal Department; with copy (which copy shall not constitute notice) to Latham & Watkins LLP, 140 Scott Drive, Menlo Park, California 94025 Attention: B. Shayne Kennedy and Brian J. Cuneo. Notices to the Company shall be given to it at Ultragenyx Pharmaceutical Inc., 60 Leveroni Court, Novato, California 94949, (fax: (415) 483-8810); Attention: Chief Financial Officer; with copy (which copy shall not constitute notice) to Ropes & Gray LLP, Three Embarcadero Center, San Francisco, California 94111 (fax: (415) 315-6026); Attention: Ryan A. Murr.

(c) *Governing Law*. This Agreement and any claim, controversy or dispute arising under or related to this Agreement shall be governed by and construed in accordance with the laws of the State of New York applicable to agreements made and to be performed in such state.

(d) *Counterparts*. This Agreement may be signed in counterparts (which may include counterparts delivered by any standard form of telecommunication), each of which shall be an original and all of which together shall constitute one and the same instrument.

(e) *Amendments or Waivers*. No amendment or waiver of any provision of this Agreement, nor any consent or approval to any departure therefrom, shall in any event be effective unless the same shall be in writing and signed by the parties hereto.

(f) *Headings*. The headings herein are included for convenience of reference only and are not intended to be part of, or to affect the meaning or interpretation of, this Agreement.

If the foregoing is in accordance with your understanding, please indicate your acceptance of this Agreement by signing in the space provided below.

Very truly yours,

ULTRAGENYX PHARMACEUTICAL INC.

By: _____
Name:
Title:

Accepted: , 2014

J. P. MORGAN SECURITIES LLC
MORGAN STANLEY & CO. LLC

For themselves and on behalf of the
several Underwriters listed
in Schedule 1 hereto.

J. P. MORGAN SECURITIES LLC

By: _____
Authorized Signatory

MORGAN STANLEY & CO. LLC

By: _____
Authorized Signatory

Schedule 1

Underwriter	Number of Shares
J. P. Morgan Securities LLC	
Morgan Stanley & Co. LLC	
Cowen and Company LLC	
Canaccord Genuity Inc.	
Total	

Form of Opinion of Ropes & Gray LLP

[ ]

[Form of Opinion of IP Counsel for the Company]

[ ]

a. **Pricing Disclosure Package**

[ ]

b. **Pricing Information Provided Orally by Underwriters**

[ ]

Written Testing-the-Waters Communications

Ultragenyx Pharmaceutical Inc.

Pricing Term Sheet

[ ]

Exhibit A

LOCK-UP AGREEMENT

, 2013

J. P. MORGAN SECURITIES LLC
Morgan Stanley & Co. LLC
As Representatives of
the several Underwriters listed in
Schedule 1 to the Underwriting
Agreement referred to below

c/o J. P. Morgan Securities LLC
383 Madison Avenue
New York, NY 10179

c/o Morgan Stanley & Co. LLC
1585 Broadway
New York, NY 10036

Re: Ultragenyx Pharmaceutical Inc. — Public Offering

Ladies and Gentlemen:

The undersigned understands that you, as Representatives of the several Underwriters, propose to enter into an Underwriting Agreement (the "Underwriting Agreement") with Ultragenyx Pharmaceutical Inc., a Delaware corporation (the "Company"), providing for the public offering (the "Public Offering") by the several Underwriters named in Schedule 1 to the Underwriting Agreement (the "Underwriters"), of common stock, of the Company (the "Securities"). Capitalized terms used herein and not otherwise defined shall have the meanings set forth in the Underwriting Agreement.

In consideration of the Underwriters' agreement to purchase and make the Public Offering of the Securities, and for other good and valuable consideration receipt of which is hereby acknowledged, the undersigned hereby agrees that, without the prior written consent of J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC on behalf of the Underwriters, the undersigned will not, during the period commencing on the date hereof and ending 180 days after the date of the final prospectus (the "Prospectus") relating to the Public Offering (the "Restricted Period"), (1) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend or otherwise transfer or dispose of, directly or indirectly, any shares of Common Stock, $0.001 par value per share, of the Company (the "Common Stock") or any securities convertible into or exercisable or exchangeable for Common Stock (including without limitation, Common Stock or such other securities which may be deemed to be beneficially owned by the undersigned in accordance with the rules and regulations of the Securities and Exchange Commission and securities which may be

issued upon exercise of a stock option or warrant), or publicly disclose the intention to make any offer, sale, pledge, loan or disposition, (2) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of the Common Stock or such other securities, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of Common Stock or such other securities, in cash or otherwise or (3) make any demand for or exercise any right with respect to the registration of any shares of Common Stock or any security convertible into or exercisable or exchangeable for Common Stock, in each case other than: (A) transfers or dispositions of shares of Common Stock (i) as a bona fide gift or gifts; (ii) to any trust for the direct or indirect benefit of the undersigned or the immediate family of the undersigned; (iii) to any corporation, partnership, limited liability company, investment fund or other entity controlled or managed, or under common control or management by the undersigned or the immediate family of the undersigned; (iv) by will, other testamentary document or intestate succession to the legal representative, heir, beneficiary or a member of the immediate family of the undersigned; or (v) as distributions to partners, members or stockholders of the undersigned; provided that in the case of any transfer or distribution pursuant to clause (A)(i) through (v), each donee or distributee shall execute and deliver to the Representatives a lock-up letter in the form of this paragraph; and provided, further, that in the case of any transfer or distribution pursuant to clause (A)(i) through (v), no filing by any party (donor, donee, transferor or transferee) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or other public announcement shall be required or shall be made voluntarily in connection with such transfer or distribution (other than a filing on a Form 5), (B) the establishment of a trading plan pursuant to Rule 10b5-1 under the Exchange Act for the transfer of shares of Common Stock, provided that (i) such plan does not provide for the transfer of Common Stock during the Restricted Period and (ii) no filing under the Exchange Act or other public announcements shall be required or voluntarily made by or on behalf of the undersigned or the Company regarding the establishment of such plan during the Restricted Period, (C) the exercise of options to purchase shares of Common Stock granted under any stock incentive plan or stock purchase plan of the Company, provided that the underlying shares shall continue to be subject to the restrictions on transfer set forth in this agreement and provided further that no filing under Section 16(a) of the Exchange Act shall be required or shall be voluntarily made during the Restricted Period (other than a filing on a Form 5), (D) the exercise (whether for cash, cashless, or net exercise) of warrants to purchase shares of Common Stock (or any security convertible into or exercisable or exchangeable for Common Stock), provided that the underlying shares shall continue to be subject to the restrictions on transfer set forth in this agreement and provided further that no filing under Section 16(a) of the Exchange Act shall be required or shall be voluntarily made during the Restricted Period (other than a filing on a Form 5), (E) the transfer of shares of Common Stock (or any security convertible into Common Stock) to the Company or sold in connection with a vesting event of the Company's securities or upon the exercise of options to purchase the Company's securities, on a "cashless" or "net exercise" basis or to cover tax withholding obligations of the undersigned in connection with such vesting or exercise provided that no filing under Section 16(a) of the Exchange Act shall be required or shall be voluntarily made during the Restricted Period (other than a filing on a Form 5), (F) the transfer or disposition of the undersigned's shares of Common Stock (or any security convertible into or exercisable or exchangeable for Common Stock) that occurs by operation of law, such as pursuant to a qualified domestic order or in connection with a divorce settlement provided that each transferee shall sign and deliver a lock-up letter substantially in the form of this letter, (G) the transfer of shares of Common Stock (or any security convertible into or exercisable or exchangeable for Common Stock) pursuant to a bona fide third party tender offer, merger, consolidation or other similar transaction made to all holders of the Common Stock involving a change of control of the Company provided that in the event that the tender offer, merger, consolidation or other such transaction is not completed, the Common Stock owned by the undersigned shall remain subject to the restrictions contained in this agreement, or (H) the transfer or disposal of shares of Common Stock acquired on the open market following the Public Offering (including shares purchased in the Public Offering) provided that no filing under Section 16(a) of the

Exchange Act shall be required or shall be voluntarily made during the Restricted Period (other than a filing on a Form 5). For purposes of this agreement, "immediate family" shall mean any relationship by blood, marriage or adoption, not more remote than first cousin and "change of control" shall mean the consummation of any bona fide third party tender offer, merger, consolidation or other similar transaction the result of which is that any "person" (as defined in Section 13(d)(3) of the Exchange Act), or group of persons, other than the Company, becomes the beneficial owner (as defined in Rules 13d-3 and 13d-5 of the Exchange Act) of 50% of total voting power of the voting stock of the Company.

If the undersigned is an officer or director of the Company, the undersigned further agrees that the foregoing provisions shall be equally applicable to any Company-directed Securities the undersigned may purchase in the Public Offering.

If the undersigned is an officer or director of the Company, (i) J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC on behalf of the Underwriters agree that, at least three business days before the effective date of any release or waiver of the foregoing restrictions in connection with a transfer of shares of Common Stock, J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC on behalf of the Underwriters will notify the Company of the impending release or waiver, and (ii) the Company has agreed in the Underwriting Agreement to announce the impending release or waiver by press release through a major news service at least two business days before the effective date of the release or waiver. Any release or waiver granted by J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC on behalf of the Underwriters hereunder to any such officer or director shall only be effective two business days after the publication date of such press release. The provisions of this paragraph will not apply if (a) the release or waiver is effected solely to permit a transfer not for consideration and (b) the transferee has agreed in writing to be bound by the same terms described in this letter to the extent and for the duration that such terms remain in effect at the time of the transfer.

In the event that any director, officer or holder of more than 1% of the Company's outstanding shares of Common Stock (determined by including any security convertible into or exercisable or exchangeable for Common Stock and calculated as of the close of business on the date set forth on the final prospectus used to sell the Securities) (each, a "Holder") other than the undersigned is permitted by the Representatives to sell or otherwise transfer or dispose of shares of Common Stock for value, the same percentage of shares of Common Stock held by the undersigned (i.e., the total number of shares of Common Stock owned by the undersigned on the date of the early release, multiplied by a fraction, the numerator of which shall be the number of shares of Common Stock of the Company initially being granted an early release and the denominator of which shall be the total number of shares of Common Stock of the Company owned by the record or beneficial owner of initially being granted an early release on the date thereof) (the "Pro-rata Release") shall be immediately and fully released, without any further action, on the same terms from any remaining lockup restrictions set forth herein; provided, however, that such Pro-rata Release shall not be applied in the event of (a) permission granted, in the aggregate, to directors, officers or holders of more than 1% of the Company's outstanding shares of Common Stock by the Representatives to sell or otherwise transfer or dispose of shares of Common Stock for an amount less than or equal to a fair market value of $1,000,000 in the aggregate (whether in one or multiple releases) of the Company's outstanding shares of Common Stock outstanding, or (b) any underwritten public offering, whether or not such offering or sale is wholly or partially a secondary offering of the Company's Common Stock during the Restricted Period (the "Underwritten Sale"); provided, however, that the undersigned, to the extent the undersigned has a contractual right to demand or require the registration of the undersigned's Common

Stock or otherwise "piggyback" on a registration statement filed by the Company for the offer and sale of its Common Stock, is offered the opportunity to participate on a basis consistent with such contractual rights in such Underwritten Sale and on pricing terms that are no less favorable than the terms of the Underwritten Sale, and provided, further, that in the event the Underwriters make the determination to cut back the number of securities to be sold by stockholders in the Underwritten Sale, such cut back shall be on a basis consistent with such contractual rights (a "Follow-on Offering"). In the event that any percentage of such Common Stock permitted to be sold or otherwise transferred or disposed for value are subject to any restrictions of the type set forth in clauses (A) through (H) of the second paragraph of this agreement, the same provisos shall be applicable to the release of the same percentage of the Common Stock held by the undersigned.

In the event that the undersigned is released from any of its obligations under this agreement or, by virtue of this agreement, becomes entitled to offer, pledge, sell, contract to sell, or otherwise dispose of any Common Stock (or any securities convertible into Common Stock) prior to the date that is 180 days after the date of the Prospectus, the Representatives shall provide at least two business days' notice to the Chief Financial Officer of the Company prior to the effective date of such release or waiver (the effective date of such release or waiver, the "Release Date"), stating the percentage of shares held by such person or entity to be released; provided that the failure of the Representatives to give such notice shall not give rise to any claim or liability against the Representatives other than with respect to a failure caused by the Representatives acting in bad faith, and the Company shall use commercially reasonable efforts to, within two business days thereafter, send notice to the undersigned stating the same percentage of shares of Common Stock held by the undersigned shall be released from the restrictions set forth herein on the Release Date; provided that the failure of the Company to give such notice shall not give rise to any claim or liability against the Company other than with respect to a failure caused by the Company acting in bad faith.

In furtherance of the foregoing, the Company, and any duly appointed transfer agent for the registration or transfer of the securities described herein, are hereby authorized to decline to make any transfer of securities if such transfer would constitute a violation or breach of this Letter Agreement.

The undersigned understands that, if (i) either J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC, on the one hand, or the Company, on the other hand, informs the other, prior to the execution of the Underwriting Agreement, that it has determined not to proceed with the Public Offering; (ii) the Underwriting Agreement does not become effective by February 14, 2014; (iii) the Underwriting Agreement (other than the provisions thereof which survive termination) shall terminate or be terminated prior to payment for and delivery of the Common Stock to be sold thereunder; or (iv) the registration statement filed with the Securities and Exchange Commission in connection with the Public Offering is withdrawn, the undersigned shall be released from all obligations under this agreement. The undersigned understands that the Company and the Underwriters are relying upon this agreement in proceeding toward consummation of the Public Offering.

Whether or not the Public Offering actually occurs depends on a number of factors, including market conditions. Any Public Offering will only be made pursuant to an Underwriting Agreement, the terms of which are subject to negotiation between the Company and the Underwriters.

This Letter Agreement and any claim, controversy or dispute arising under or related to this Letter Agreement shall be governed by and construed in accordance with the laws of the State of New York, without regard to the conflict of laws principles thereof.

Very truly yours,

[*NAME OF STOCKHOLDER*]

By: _____
Name:
Title:

If not signing in an individual capacity:

_____
Name of Authorized Signatory *(Print*)

_____
Title of Authorized Signatory *(Print*)

(indicate capacity of person signing if signing as custodian, trustee, or on behalf of an entity)

Exhibit B

Form of Waiver of Lock-up

Ultragenyx Pharmaceutical Inc.
Public Offering of Common Stock

, 20

[Name and Address of
Officer or Director
Requesting Waiver]

Dear Mr./Ms. [Name]:

This letter is being delivered to you in connection with the offering by Ultragenyx Pharmaceutical Inc. (the "Company") of shares of common stock, $0.001 par value (the "Common Stock"), of the Company and the lock-up letter dated , 201 (the "Lock-up Letter"), executed by you in connection with such offering, and your request for a [waiver] [release] dated , 201 , with respect to shares of Common Stock (the "Shares").

J.P. Morgan Securities LLC hereby agrees to [waive] [release] the transfer restrictions set forth in the Lock-up Letter, but only with respect to the Shares, effective , 201 ; provided, however, that such [waiver] [release] is conditioned on the Company announcing the impending [waiver] [release] by press release through a major news service at least two business days before effectiveness of such [waiver] [release]. This letter will serve as notice to the Company of the impending [waiver] [release].

Except as expressly [waived] [released] hereby, the Lock-up Letter shall remain in full force and effect.

Yours very truly,

[Signature of J.P. Morgan Securities LLC Representative]

[Name of J.P. Morgan Securities LLC Representative]

cc: Company

Form of Press Release

Ultragenyx Pharmaceutical Inc.
[Date]

Ultragenyx Pharmaceutical Inc. (the "Company") announced today that J.P. Morgan Securities LLC and Morgan Stanley & Co. LLC, the co-book-running managers in the Company's recent public sale of shares of common stock, are [waiving] [releasing] a lock-up restriction with respect to shares of the Company's common stock held by [certain officers or directors] [an officer or director] of the Company. The [waiver] [release] will take effect on , 201 , and the shares may be sold on or after such date.

This press release is not an offer for sale of the securities in the United States or in any other jurisdiction where such offer is prohibited, and such securities may not be offered or sold in the United States absent registration or an exemption from registration under the United States Securities Act of 1933, as amended.

Individuals Not Signing a Lock-Up Agreement

Mari Maurer
Jonathan Wright

Exhibit 3.3

CERTIFICATE OF AMENDMENT

OF

AMENDED AND RESTATED CERTIFICATE OF INCORPORATION

OF

ULTRAGENYX PHARMACEUTICAL INC.

Ultragenyx Pharmaceutical Inc., a Delaware corporation (the "Corporation"), hereby certifies that this Certificate of Amendment of Amended and Restated Certificate of Incorporation has been duly adopted in accordance with Sections 228 and 242 of the General Corporation Law of the State of Delaware (the "DGCL"), and that:

A. The name of the Corporation is: Ultragenyx Pharmaceutical Inc.

B. The original Certificate of Incorporation of the Corporation was filed with the Secretary of the State of Delaware on June 13, 2011 and amended and restated on December 18, 2012 (as most recently amended, the "Original Certificate of Incorporation").

C. This Original Certificate of Incorporation is hereby further amended by deleting paragraph A of Article IV in its entirety and replacing it with the following:

> "A. Classes of Stock. This Corporation is authorized to issue two classes of stock to be designated, respectively, "Common Stock" and "Preferred Stock." The total number of shares that this Corporation is authorized to issue is One Hundred Forty-Seven Million, Four Hundred Fifty-Nine Thousand, Two Hundred Thirty-Six (147,459,236) shares. Eighty-Five Million (85,000,000) shares shall be Common Stock, each with a par value of $0.001 per share and Sixty-Two Million, Four Hundred Fifty-Nine Thousand, Two Hundred Thirty-Six (62,459,236) shares shall be Preferred Stock, each with a par value of $0.001 per share. Effective as of January 17, 2014 at 12:01 a.m. Eastern time, each 3.1345 outstanding shares of Common Stock of the Corporation shall be combined and converted automatically into one share of Common Stock (the "Reverse Stock Split"). In lieu of any fractional shares to which a holder would be otherwise entitled, the Corporation shall pay cash equal to such fraction multiplied by the fair market value of one share of Common Stock (pre-reverse stock split), as determined by the Board of Directors of the Corporation. The Common Stock issued in this exchange (post-reverse stock split) shall have the same rights, preferences and privileges as the Common Stock (pre-reverse stock split). The Reverse Stock Split shall have no effect on the total number of shares of stock which the Corporation has authority to issue."

[signature page follows]

IN WITNESS WHEREOF, the undersigned has caused this Certificate of Amendment of Amended and Restated Certificate of Incorporation to be executed by the officer below this 17th day of January, 2014.

ULTRAGENYX PHARMACEUTICAL INC.

By: /s/ Shalini Sharp
Name: Shalini Sharp
Title: Chief Financial Officer, Senior Vice President and Secretary

(Certificate of Amendment of Amended and Restated Certificate of Incorporation)

Exhibit 3.4

AMENDED AND RESTATED CERTIFICATE OF INCORPORATION

OF

ULTRAGENYX PHARMACEUTICAL INC.

Ultragenyx Pharmaceutical Inc., a Delaware corporation (the "Corporation"), hereby certifies that this Amended and Restated Certificate of Incorporation has been duly adopted in accordance with Sections 228, 242 and 245 of the General Corporation Law of the State of Delaware (the "DGCL"), and that:

A. The name of the Corporation is: Ultragenyx Pharmaceutical Inc.

B. The original Certificate of Incorporation of the Corporation was filed with the Secretary of the State of Delaware on June 13, 2011 and amended and restated on December 18, 2012 (as most recently amended, the "Original Certificate of Incorporation").

C. This Amended and Restated Certificate of Incorporation amends and restates the Original Certificate of Incorporation of the Corporation.

D. The Certificate of Incorporation upon the filing of this Amended and Restated Certificate of Incorporation, shall read as follows:

ARTICLE I – NAME

The name of the corporation is Ultragenyx Pharmaceutical Inc. (the "Corporation").

ARTICLE II – REGISTERED OFFICE AND AGENT

The address of the Corporation's registered office in the State of Delaware is 1209 Orange Street, in the City of Wilmington, County of New Castle, 19801. The name of the Corporation's registered agent at such address is The Corporation Trust Company.

ARTICLE III – PURPOSE

The purpose of the Corporation is to engage in any lawful act or activity for which corporations may be organized under the DGCL.

ARTICLE IV – CAPITALIZATION

(a) Authorized Shares. The total number of shares of stock which the Corporation shall have authority to issue is 275,000,000 shares, consisting of 250,000,000 shares of Common Stock, par value $0.001 per share ("Common Stock") and 25,000,000 shares of Preferred Stock, par value $0.001 per share ("Preferred Stock").

(b) Preferred Stock. Shares of Preferred Stock may be issued in one or more series, from time to time, with each such series to consist of such number of shares and to have such voting powers relative to other classes of Preferred Stock, if any, or Common Stock, full or

limited, or no voting powers, and such designations, preferences and relative, participating, optional or other special rights, and the qualifications, limitations or restrictions thereof, as shall be stated in the resolution or resolutions providing for the issuance of such series adopted by the Board of Directors of the Corporation, and the Board of Directors is hereby expressly vested with the authority, to the full extent now or hereafter provided by applicable law, to adopt any such resolution or resolutions.

(c) Common Stock. Each holder of Common Stock, as such, shall be entitled to one vote for each share of Common Stock held of record by such holder on all matters on which stockholders generally are entitled to vote; provided, that, except as otherwise required by law, holders of Common Stock, as such, shall not be entitled to vote on any amendment to this Amended and Restated Certificate of Incorporation (including, but not limited to, any certificate of designations relating to any series of Preferred Stock) that relates solely to the terms of one or more outstanding series of Preferred Stock if the holders of such affected series are entitled, either separately or together with the holders of one or more other such series, to vote thereon pursuant to this Amended and Restated Certificate of Incorporation (including, but not limited to, any certificate of designations relating to any series of Preferred Stock) or pursuant to the DGCL. Dividends may be declared and paid or set apart for payment upon the Common Stock out of any assets or funds of the Corporation legally available for the payment of dividends, but only when and as declared by the Board of Directors or any authorized committee thereof. Upon the voluntary or involuntary liquidation, dissolution or winding up of the Corporation, the net assets of the Corporation shall be distributed pro rata to the holders of the Common Stock.

(d) No Class Vote On Changes In Authorized Number of Shares. Subject to the rights of the holders of any series of Preferred Stock pursuant to the terms of this Amended and Restated Certificate of Incorporation, any certificate of designations or any resolution or resolutions providing for the issuance of such series of stock adopted by the Board of Directors, the number of authorized shares of Common Stock or Preferred Stock may be increased or decreased (but not below the number of shares thereof then outstanding) by the affirmative vote of the holders of a majority of the stock of the Corporation entitled to vote irrespective of the provisions of Section 242(b)(2) of the DGCL.

ARTICLE V – BOARD OF DIRECTORS

(a) Number of Directors; Vacancies and Newly Created Directorships. The number of directors constituting the Board of Directors shall be not fewer than 5 and not more than 12, each of whom shall be a natural person. Subject to the previous sentence and to the special rights of the holders of any class or series of stock to elect directors, the precise number of directors shall be fixed exclusively pursuant to a resolution adopted by the Board of Directors. Vacancies and newly-created directorships shall be filled exclusively pursuant to a resolution adopted by the Board of Directors. No decrease in the number of directors constituting the Board of Directors shall shorten the term of any incumbent director. Any election of directors by stockholders shall be determined by a plurality of the votes cast by stockholders entitled to vote in the election. Subject to the special rights of any holder of any class or series of stock to elect directors, the directors of the Corporation may only be removed for cause by stockholders.

(b) Classified Board of Directors. Subject to the special right of the holders of any class or series of stock to elect directors, the Board of Directors shall be classified with respect to the time for which directors severally hold office into three classes, as nearly equal in number as possible. The initial Class I Directors shall serve for a term expiring at the first annual meeting of stockholders of the Corporation following the filing of this Amended and Restated Certificate of Incorporation; the initial Class II Directors shall serve for a term expiring at the second annual meeting of stockholders following the filing of this Amended and Restated Certificate of Incorporation; and the initial Class III Directors shall serve for a term expiring at the third annual meeting of stockholders following the filing of this Amended and Restated Certificate of Incorporation. The Board of Directors is authorized to assign members of the Board of Directors already in office to Class I, Class II and Class III at the time such classification becomes effective. Each director in each class shall hold office until his or her successor is duly elected and qualified. At each annual meeting of stockholders beginning with the first annual meeting of stockholders following the filing of this Amended and Restated Certificate of Incorporation, the successors of the class of directors whose term expires at that meeting shall be elected to hold office for a term expiring at the annual meeting of stockholders to be held in the third year following the year of their election, with each director in each such class to hold office until his or her successor is duly elected and qualified.

ARTICLE VI – LIMITATION OF DIRECTOR LIABILITY; INDEMNIFICATION AND ADVANCEMENT OF EXPENSES

(a) Limitation of Director Liability. To the fullest extent that the DGCL or any other law of the State of Delaware (as they exist on the date hereof or as they may hereafter be amended) permits the limitation or elimination of the liability of directors, no director of the Corporation shall be liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director. No amendment to, or modification or repeal of, this Article VI(a) shall adversely affect any right or protection of a director of the Corporation existing hereunder with respect to any act or omission occurring prior to such amendment, modification or repeal.

(b) Indemnification and Advancement of Expenses. The Corporation shall indemnify and advance expenses to, and hold harmless, to the fullest extent permitted by applicable law as it presently exists or may hereafter be amended, any person (an "Indemnitee") who was or is made, or is threatened to be made, a party or is otherwise involved in any action, suit or proceeding, whether civil, criminal, administrative or investigative (a "Proceeding"), by reason of the fact that he or she, or a person for whom he or she is the legal representative, is or was a director or an officer of the Corporation or, while a director or an officer of the Corporation, is or was serving at the request of the Corporation as a director, officer, employee, member, trustee or agent of another corporation or of a partnership, joint venture, trust, nonprofit entity or other enterprise (including, but not limited to, service with respect to employee benefit plans), against all liability and loss suffered (including, but not limited to, expenses (including, but not limited to, attorneys' fees and expenses), judgments, fines and amounts paid in settlement and reasonably incurred by such Indemnitee). Notwithstanding the preceding sentence, the Corporation shall be required to indemnify, or advance expenses to, an Indemnitee in connection with a Proceeding (or part thereof) commenced by such Indemnitee only if the commencement of such Proceeding (or part thereof) by the Indemnitee was authorized by the Board of Directors of the Corporation or the Proceeding (or part thereof) relates to the enforcement of the Corporation's obligations under this Article VI(b).

(c) Insurance. The Corporation shall purchase and maintain insurance on behalf of any person who is or was a director, officer, trustee, employee or agent of the Corporation, or was serving at the request of the Corporation as a director, officer, trustee, employee or agent of another corporation, partnership, joint venture, trust, non-profit entity or other enterprise (including, but not limited to, service with respect to employee benefit plans), against any liability asserted against the person and incurred by the person in any such capacity, or arising out of his or her status as such, whether or not the Corporation would have the power or the obligation to indemnify such person against such liability under the provisions of this Article VI.

(d) Non-Exclusivity of Rights. The indemnification provided by this Article VI is not exclusive of other indemnification rights arising under any bylaw, agreement, vote of directors or stockholders or otherwise, and shall inure to the benefit of the heirs and legal representatives of such Indemnitee.

ARTICLE VII – MEETINGS OF STOCKHOLDERS

(a) No Action by Written Consent. Except as otherwise provided for or fixed by or pursuant to the provisions of this Amended and Restated Certificate of Incorporation or any resolution or resolutions of the Board of Directors providing for the issuance of Preferred Stock, any action required or permitted to be taken by the stockholders of the Corporation may be effected only at a duly called annual or special meeting of stockholders of the Corporation and may not be effected by any consent in writing by such stockholders.

(b) Special Meetings of Stockholders. Subject to the rights of the holders of any series of Preferred Stock, and to the requirements of applicable law, special meetings of stockholders of the Corporation may be called only by either (a) the Chairman of the Board of Directors or (b) the Board of Directors.

(c) Election of Directors by Written Ballot. Election of directors need not be by written ballot.

ARTICLE VIII – AMENDMENTS TO THE AMENDED AND RESTATED CERTIFICATE OF INCORPORATION AND BYLAWS

(a) Amendments to the Bylaws. In furtherance and not in limitation of the powers conferred by law, the Board of Directors is expressly authorized to make, alter, amend or repeal the Bylaws of the Corporation subject to the power of the stockholders of the Corporation to alter, amend or repeal the Bylaws; provided, that with respect to the powers of stockholders to make, alter, amend or repeal the Bylaws, the affirmative vote of the holders of at least seventy five percent (75%) of the capital stock of the Corporation entitled to vote generally in an election of directors, voting together as a single class, shall be required to make, alter amend or repeal the Bylaws of the Corporation.

(b) Amendments to the Certificate of Incorporation. Notwithstanding any other provision of this Certificate of Incorporation, and notwithstanding that a lesser percentage may

be permitted from time to time by applicable law, no provision of Article V, paragraphs (a) and (b) of Article VII, Article VIII, and Article IX may be altered, amended or repealed in any respect, nor may any provision or bylaw inconsistent therewith be adopted, unless such alteration, amendment, repeal or adoption is approved by the affirmative vote of the holders of at least seventy-five percent (75%) of the voting power of the outstanding shares of capital stock entitled to vote on the subject matter.

ARTICLE IX – EXCLUSIVE JURISDICTION OF CERTAIN ACTIONS

The Court of Chancery of the State of Delaware shall, to the fullest extent permitted by applicable law, be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of the Corporation, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the Corporation to the Corporation or the Corporation's stockholders, (iii) any action asserting a claim against the Corporation arising pursuant to any provision of the DGCL or the Corporation's Amended and Restated Certificate of Incorporation or Bylaws or (iv) any action asserting a claim against the Corporation governed by the internal affairs doctrine, in each such case subject to said Court of Chancery having personal jurisdiction over the indispensable parties named as defendants therein. Any person or entity purchasing or otherwise acquiring any interest in the shares of capital stock of the Corporation shall be deemed to have notice of and consented to the provisions of this Article IX.

[Remainder of page intentionally left blank – signature page follows]

IN WITNESS WHEREOF, the undersigned has caused this Amended and Restated Certificate of Incorporation to be executed by the officer below this day of , 2014.

ULTRAGENYX PHARMACEUTICAL INC.

By: _____
Name:
Title:

ULTRAGENYX PHARMACEUTICAL INC. (the "Corporation")
AMENDED & RESTATED BYLAWS

SECTION 1 - STOCKHOLDERS

Section 1.1. Annual Meeting. An annual meeting of the stockholders for the election of directors to succeed those whose term expire and for the transaction of such other business as may properly come before the meeting shall be held at the place, if any, within or without the State of Delaware, on the date and at the time that the Board of Directors shall each year fix. Unless stated otherwise in the notice of the annual meeting of the stockholders of the Corporation, such annual meeting shall be at the principal office of the Corporation.

Section 1.2. Advance Notice of Nominations and Proposals of Business.

(a) Nominations of persons for election to the Board of Directors and proposals for business to be transacted by the stockholders at an annual meeting of stockholders may be made (i) pursuant to the Corporation's notice with respect to such meeting, (ii) by or at the direction of the Board of Directors or (iii) by any stockholder of record of the Corporation who (A) was a stockholder of record at the time of the giving of the notice contemplated in Section 1.2(b), (B) is entitled to vote at such meeting and (C) has complied with the notice procedures set forth in this Section 1.2. Except as otherwise required by law, clause (iii) of this Section 1.2 shall be the exclusive means for a stockholder to make nominations or propose other business (other than nominations and proposals properly brought pursuant to applicable provisions of federal law, including the Securities Exchange Act of 1934 (as amended from time to time, the "Act") and the rules and regulations of the Securities and Exchange Commission thereunder) before an annual meeting of stockholders.

(b) Except as otherwise required by law, for nominations or proposals to be properly brought before an annual meeting by a stockholder pursuant to clause (iii) of Section 1.2(a), (i) the stockholder must have given timely notice thereof in writing to the Secretary of the Corporation with the information contemplated by Section 1.2(c), and (ii) the business must be a proper matter for stockholder action under the Delaware General Corporation Law (the "DGCL").

(c) To be timely for purposes of Section 1.2(b), a stockholder's notice must be delivered to the Secretary of the Corporation at the principal executive offices of the Corporation a date (i) not less than 90 nor more than 120 days prior to the anniversary date of the prior year's annual meeting or (ii) if there was no annual meeting in the prior year or if the date of the current year's annual meeting is more than 30 days before or 60 days after the anniversary date of the prior year's annual meeting, on or before 10 days after the day on which the date of the current year's annual meeting is first disclosed in a public announcement. In no event shall any adjournment or postponement of an annual meeting or the announcement thereof commence a new time period for the delivery of such notice. Such notice from a stockholder must state (i) as to each nominee that the stockholder proposes for election or reelection as a director, (A) all information relating to such nominee that would be required to be disclosed in solicitations of proxies for the election of such nominee as a director pursuant to Regulation 14A under the Act

and such nominee's written consent to serve as a director if elected, and (B) a description of all direct and indirect compensation and other material monetary arrangements, agreements or understandings during the past three years, and any other material relationship, if any, between or concerning such stockholder and its respective affiliates or associates, on the one hand, and the proposed nominee, and his or her respective affiliates or associates, on the other hand; (ii) as to each proposal that the stockholder seeks to bring before the meeting, a brief description of such proposal, the reasons for making the proposal at the meeting, and any material interest that the stockholder has in the proposal; (iii) (A) the name and address of the stockholder, (B) the class (and, if applicable, series) and number of shares of stock of the Corporation that are, directly or indirectly, owned beneficially or of record by the stockholder or any Stockholder Associated Person (as defined below), (C) any option, warrant, convertible security, stock appreciation right or similar right with an exercise or conversion privilege or a settlement payment or mechanism at a price related to any class (or, if applicable, series) of shares of stock of the Corporation or with a value derived in whole or in part from the value of any class (or, if applicable, series) of shares of stock of the Corporation, whether or not such instrument or right shall be subject to settlement in the underlying class or series of capital stock of the Corporation or otherwise (each, a "Derivative Instrument") directly or indirectly owned beneficially or of record by such stockholder or any Stockholder Associated Person and any other direct or indirect opportunity to profit or share in any profit derived from any increase or decrease in the value of shares of stock of the Corporation of the stockholder or any Stockholder Associated Person, (D) any proxy, contract, arrangement, understanding or relationship pursuant to which such stockholder or any Stockholder Associated Person has a right to vote any securities of the Corporation, (E) any proportionate interest in shares of the Corporation or Derivative Instruments held, directly or indirectly, by a general or limited partnership in which such stockholder or any Stockholder Associated Person is a general partner or beneficially owns an interest in a general partner, (F) any performance-related fees (other than an asset-based fee) that such stockholder or any Stockholder Associated Person is entitled to based on any increase or decrease in the value of the shares of stock of the Corporation or Derivative Instruments and (G) whether either the stockholder intends to deliver a proxy statement and form of proxy to holders of, in the case of a proposal, at least the percentage of the Corporation's voting shares required under applicable law to carry the proposal or, in the case of a nomination or nominations, a sufficient number of holders of the Corporation's voting shares reasonably believed by such stockholder to be sufficient to elect such nominee or nominees. For purposes of these by-laws, a "STOCKHOLDER ASSOCIATED PERSON" of any stockholder means any "affiliate" or "associate" (as those terms are defined in Rule 12b-2 under the Act) of the stockholder that owns beneficially or of record any capital stock or other securities of the Corporation. In addition, any nominee proposed by a stockholder shall complete a questionnaire, in a form provided by the Corporation, within 10 days of receipt of the form of questionnaire from the Corporation.

(d) Subject to the certificate of incorporation of the Corporation and applicable law, only persons nominated in accordance with procedures stated in this Section 1.2 shall be eligible for election as and to serve as members of the Board of Directors and the only business that shall be conducted at an annual meeting of stockholders is the business that has been brought before the meeting in accordance with the procedures set forth in this Section 1.2. The chairman of the meeting shall have the power and the duty to determine whether a nomination or any proposal has been made according to the procedures stated in this Section 1.2 and, if any nomination or proposal does not comply with this Section 1.2, unless otherwise required by law, the nomination or proposal shall be disregarded.

(e) For purposes of this Section 1.2, "public announcement" means disclosure in a press release reported by the Dow Jones News Service, Associated Press or a comparable news service or in a document publicly filed by the Corporation with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the Act.

(f) Notwithstanding the foregoing provisions of this Section 1.2, a stockholder shall also comply with applicable requirements of the Act and the rules and regulations thereunder with respect to matters set forth in this Section 1.2. Nothing in this Section 1.2 shall affect any rights, if any, of stockholders to request inclusion of nominations or proposals in the Corporation's proxy statement pursuant to applicable provisions of federal law, including the Act.

Section 1.3. Special Meetings; Notice.

Special meetings of the stockholders of the Corporation may be called only in the manner set forth in the certification of incorporation of the Corporation. Notice of every special meeting of the stockholders of the Corporation shall state the purpose of such meeting. Except as otherwise required by law, the business conducted at a special meeting of stockholders of the Corporation shall be limited exclusively to the business set forth in the Corporation's notice of meeting, and the individual or group calling such meeting shall have exclusive authority to determine the business included in such notice.

Section 1.4. Notice of Meetings.

Notice of the place, if any, date and time of all meetings of stockholders of the Corporation, and the means of remote communications, if any, by which stockholders and proxy holders may be deemed present and vote at such meeting, and, in the case of all special meetings of stockholders, the purpose of the meeting, shall be given, not less than 10 nor more than 60 days before the date on which such meeting is to be held, to each stockholder entitled to notice of the meeting.

The Corporation may postpone or cancel any previously called annual or special meeting of stockholders of the Corporation by making a public announcement (as defined in Section 1.2(e)) of such postponement or cancellation prior to the meeting. When a previously called annual or special meeting is postponed to another time or place, if any, notice of the place (if any), date and time of the postponed meeting and the means of remote communications, if any, by which stockholders and proxy holders may be deemed present and vote at such postponed meeting, shall be given in conformity with this Section 1.4 unless such meeting is postponed not more than 60 days after initial notice of the meeting was provided in conformity with this Section 1.4.

When a meeting is adjourned to another time or place, notice need not be given of the adjourned meeting if the time and place, if any, thereof and the means of remote communication, if any, by which stockholders and proxy holders may be deemed to be present and vote at such adjourned meeting are announced at the meeting at which the adjournment is taken; however, if

the date of any adjourned meeting is more than 30 days after the date for which the meeting was originally noticed, or if a new record date is fixed for voting at the adjourned meeting, notice of the place, if any, date and time of the adjourned meeting and the means of remote communication, if any, by which stockholders and proxy holders may be deemed present and vote at such adjourned meeting, shall be given in conformity herewith. At any adjourned meeting, any business may be transacted that may have been transacted at the original meeting.

Section 1.5. Quorum.

At any meeting of the stockholders, the holders of shares of stock of the Corporation entitled to cast a majority of the total votes entitled to be cast by the holders of all outstanding capital stock of the Corporation, present in person or by proxy, shall constitute a quorum for all purposes, unless or except to the extent that the presence of a larger number is required by applicable law or the certificate of incorporation of the Corporation. If a separate vote by one or more classes or series is required, the holders of shares entitled to cast a majority of the total votes entitled to be cast by the holders of the shares of the class or classes or series, present in person or represented by proxy, shall constitute a quorum entitled to take action with respect to that vote on that matter.

If a quorum shall fail to attend any meeting, the chairman of the meeting may adjourn the meeting to another place, if any, date and time.

Section 1.6. Organization.

The Chairman of the Board or, in his or her absence, the person whom the Board of Directors designates or, in the absence of that person or the failure of the Board of Directors to designate a person, the President of the Corporation or, in his or her absence, the person chosen by the holders of a majority of the shares entitled to vote who are present, in person or by proxy, shall call to order any meeting of the stockholders of the Corporation and act as chairman of the meeting. In the absence of the Secretary or any Assistant Secretary of the Corporation, the secretary of the meeting shall be the person the chairman appoints.

Section 1.7. Conduct of Business.

The chairman of any meeting of stockholders of the Corporation shall determine the order of business and the rules of procedure for the conduct of such meeting, including the manner of voting and the conduct of discussion as he or she determines to be in order. The chairman shall have the power to adjourn the meeting to another place, if any, date and time. The date and time of the opening and closing of the polls for each matter upon which the stockholders will vote at the meeting shall be announced at the meeting.

Section 1.8. Proxies; Inspectors.

(a) At any meeting of the stockholders, every stockholder entitled to vote may vote in person or by proxy authorized by an instrument in writing or by a transmission permitted by applicable law.

(b) Prior to a meeting of the stockholders of the Corporation, the Corporation shall appoint one or more inspectors to act at a meeting of stockholders of the Corporation and make a written report thereof. The Corporation may designate one or more persons as alternate inspectors to replace any inspector who fails to act. If no inspector or alternate is able to act at a meeting of stockholders, the person presiding at the meeting may, and to the extent required by applicable law, shall, appoint one or more inspectors to act at the meeting. Each inspector, before beginning the discharge of his or her duties, shall take and sign an oath faithfully to execute the duties of inspector with strict impartiality and according to the best of his or her ability. The inspectors may appoint or retain other persons or entities to assist the inspectors in the performance of the duties of inspectors. The inspectors shall have the duties prescribed by applicable law.

Section 1.9. Voting.

Except as otherwise required by applicable law or by the certificate of incorporation of the Corporation, all matters other than the election of directors shall be determined by a majority of the votes cast on the matter affirmatively or negatively. All elections of directors shall be determined by a plurality of the votes cast.

Section 1.10. Stock List.

A complete list of stockholders of the Corporation entitled to vote at any meeting of stockholders of the Corporation, arranged in alphabetical order for each class of stock and showing the address of each such stockholder and the number of shares registered in the name of such stockholder, shall be open to the examination of any such stockholder, for any purpose germane to a meeting of the stockholders of the Corporation, for a period of at least 10 days before the meeting (i) on a reasonably accessible electronic network, provided that the information required to gain access to such list is provided with the notice of the meeting or (ii) during ordinary business hours at the principal place of business of the Corporation; provided, however, if the record date for determining the stockholders entitled to vote is less than 10 days before the meeting date, the list shall reflect the stockholders entitled to vote as of the 10th day before such meeting date.

The stock list shall also be open to the examination of any such stockholder during the entire meeting. The Corporation may look to this list as the sole evidence of the identity of the stockholders entitled to vote at a meeting and the number of shares held by each stockholder.

SECTION 2 - BOARD OF DIRECTORS

Section 2.1. Qualifications of Directors.

Directors need not be stockholders to be qualified for election or service as a director of the Corporation.

Section 2.2. Removal; Resignation.

Any director or the entire Board of Directors may be removed, but only with cause, by the holders of a majority of the shares then entitled to vote at an election of directors. Any director may resign at any time upon notice given in writing, including by electronic transmission, to the Corporation.

Section 2.3. Regular Meetings.

Regular meetings of the Board of Directors shall be held at the place (if any), on the date and at the time as shall have been established by the Board of Directors and publicized among all directors. A notice of a regular meeting, the date of which has been so publicized, shall not be required.

Section 2.4. Special Meetings.

Special meetings of the Board of Directors may be called by the President or by two or more directors then in office and shall be held at the place, if any, on the date and at the time as he, she or they shall fix. Notice of the place, if any, date and time of each special meeting shall be given to each director either (a) by mailing written notice thereof not less than five days before the meeting, or (b) by telephone, facsimile or electronic transmission (including via email) providing notice thereof not less than twenty-four hours before the meeting. Unless otherwise stated in the notice thereof, any and all business may be transacted at a special meeting of the Board of Directors.

Section 2.5. Quorum.

At any meeting of the Board of Directors, a majority of the total number of directors then in office shall constitute a quorum for all purposes. If a quorum shall fail to attend any meeting, a majority of those present may adjourn the meeting to another place, if any, date or time, without further notice or waiver thereof.

Section 2.6. Participation in Meetings By Conference Telephone or Other Communications Equipment.

Members of the Board of Directors, or of any committee thereof, may participate in a meeting of the Board of Directors or committee thereof by means of conference telephone or other communications equipment by means of which all directors participating in the meeting can hear each other director, and such participation shall constitute presence in person at the meeting.

Section 2.7. Conduct of Business.

At any meeting of the Board of Directors, business shall be transacted in the order and manner that the Board of Directors may from time to time determine, and all matters shall be determined by the vote of a majority of the directors present, except as otherwise provided in the certificate of incorporation of the Corporation or these bylaws or required by applicable law. The Board of Directors or any committee thereof may take action without a meeting if all members thereof consent thereto in writing or by electronic transmission, and the writing or writings, or electronic transmission or electronic transmissions, are filed with the minutes of proceedings of the Board of Directors or any committee thereof. Such filing shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form.

Section 2.8. Compensation of Directors.

The Board of Directors shall be authorized to fix the compensation of directors. The directors of the Corporation shall be paid their expenses, if any, of attendance at each meeting of the Board of Directors and may be reimbursed a fixed sum for attendance at each meeting of the Board of Directors, paid an annual retainer or paid other compensation, including equity compensation, as directors of the Corporation determine. No such payment shall preclude any director from serving the Corporation in any other capacity and receiving compensation therefor. Members of committees have their expenses, if any, of attendance of each meeting of such committee reimbursed and may be paid compensation for attending committee meetings or being a member of a committee.

SECTION 3 - COMMITTEES

Section 3.1. Committees of the Board of Directors.

The Board of Directors may designate committees of the Board of Directors, with such lawfully delegable powers and duties as it thereby confers, to serve at the pleasure of the Board of Directors and shall, for those committees, appoint a director or directors to serve as the member or members, designating, if it desires, other directors as alternate members who may replace any absent or disqualified member at any meeting of such committee. In the absence or disqualification of any member of any committee and any alternate member in his or her place, the member or members of the committee present at the meeting and not disqualified from voting, whether or not he or she or they constitute a quorum, may by unanimous vote appoint another member of the Board of Directors to act at the meeting in the place of the absent or disqualified member.

SECTION 4 - OFFICERS

Section 4.1. Generally.

The officers of the Corporation shall consist of a President, one or more Vice Presidents, a Secretary, one or more Assistant Secretaries, a Treasurer, one or more Assistant Treasurers, a Chief Financial Officer and other officers as may from time to time be appointed by the Board of Directors. Each officer shall hold office until his or her successor is elected and qualified or until his or her earlier resignation or removal. Any number of offices may be held by the same person. The compensation of officers appointed by the Board of Directors shall be determined from time to time by the Board of Directors or a committee thereof or by the officers as may be designated by resolution of the Board of Directors.

Section 4.2. President.

Unless otherwise determined by the Board of Directors, the President shall be the Chief Executive Officer of the Corporation. Subject to the provisions of these bylaws and to the direction of the Board of Directors, he or she shall have the responsibility for the general

management and control of the business and affairs of the Corporation and shall perform all duties and have all powers that are commonly incident to the office of chief executive or which are delegated to him or her by the Board of Directors. He or she shall have the power to sign all stock certificates, contracts and other instruments of the Corporation that are authorized and shall have general supervision and direction of all of the other officers, employees and agents of the Corporation.

Section 4.3. Vice President.

Each Vice President shall have the powers and duties delegated to him or her by the Board of Directors or the President. One Vice President may be designated by the Board of Directors to perform the duties and exercise the powers of the President in the event of the President's absence or disability. A Vice President need not be an officer of the Corporation, and shall not be deemed an officer of the Corporation, unless so appointed by the Board of Directors.

Section 4.4. Secretary and Assistant Secretaries.

The Secretary shall issue all authorized notices for, and shall keep minutes of, all meetings of the stockholders and the Board of Directors. He or she shall have charge of the corporate books and shall perform other duties as the Board of Directors may from time to time prescribe.

Any Assistant Secretary shall perform such duties and possess such powers as the Board of Directors, the Chief Executive Officer or the Secretary may from time to time prescribe. In the event of the absence, inability or refusal to act of the Secretary, the Assistant Secretary (or if there shall be more than one, the Assistant Secretaries in the order determined by the Board of Directors) shall perform the duties and exercise the powers of the Secretary.

Section 4.5. Chief Financial Officer.

The Chief Financial Officer shall keep or cause to be kept the books of account of the Corporation in a thorough and proper manner and shall render statements of the financial affairs of the Corporation in such form and as often as required by the Board of Directors or the President. The Chief Financial Officer, subject to the order of the Board of Directors, shall have the custody of all funds and securities of the Corporation. The Chief Financial Officer shall perform other duties commonly incident to his office and shall also perform such other duties and have such other powers as the Board of Directors or the President shall designate from time to time. The President may direct the Treasurer or any Assistant Treasurer to assume and perform the duties of the Chief Financial Officer in the absence or disability of the Chief Financial Officer, and each Treasurer and Assistant Treasurer shall perform other duties commonly incident to his office and shall also perform such other duties and have such other powers as the Board of Directors or the President shall designate from time to time.

Section 4.6. Delegation of Authority.

The Board of Directors may from time to time delegate the powers or duties of any officer to any other officer or agent, notwithstanding any provision hereof.

Section 4.7. Removal.

The Board of Directors may remove any officer of the Corporation at any time, with or without cause.

Section 4.8. Action with Respect to Securities of Other Companies.

Unless otherwise directed by the Board of Directors, the President, or any officer of the Corporation authorized by the President, shall have power to vote and otherwise act on behalf of the Corporation, in person or by proxy, at any meeting of stockholders or equityholders of, or with respect to any action of, stockholders or equityholders of any other entity in which the Corporation may hold securities and otherwise to exercise any and all rights and powers which the Corporation may possess by reason of its ownership of securities in such other entity.

SECTION 5 - STOCK

Section 5.1. Certificates of Stock.

Shares of the capital stock of the Corporation may be certificated or uncertificated, as provided in the DGCL. Stock certificates shall be signed by, or in the name of the Corporation by, (i) the Chairman of the Board (if any), the President or a Vice President, and (ii) the Secretary or an Assistant Secretary, or the Treasurer or an Assistant Treasurer, or the Chief Financial Officer, certifying the number of shares owned by such stockholder. Any signatures on a certificate may be by facsimile.

Section 5.2. Transfers of Stock.

Transfers of stock shall be made only upon the transfer books of the Corporation kept at an office of the Corporation (within or without the State of Delaware) or by transfer agents designated to transfer shares of the stock of the Corporation.

Section 5.3. Lost, Stolen or Destroyed Certificates.

In the event of the loss, theft or destruction of any certificate of stock, another may be issued in its place pursuant to regulations as the Board of Directors may establish concerning proof of the loss, theft or destruction and concerning the giving of a satisfactory bond or indemnity, if deemed appropriate.

Section 5.4. Regulations.

The issue, transfer, conversion and registration of certificates of stock of the Corporation shall be governed by other regulations as the Board of Directors may establish.

Section 5.5. Record Date.

(a) In order for the Corporation to determine the stockholders of the Corporation entitled to notice of any meeting of stockholders of the Corporation, the Board of Directors may, except as otherwise required by applicable law, fix a record date, which record

date shall not precede the date on which the resolution fixing the record date is adopted and which record date shall not be more than 60 nor less than 10 days before the date of any meeting of stockholders. If the Board of Directors so fixes a date, such date shall also be the record date for determining the stockholders entitled to vote at such meeting unless the Board of Directors determines that a later date on or before the date of the meeting shall be the date for making such determination. If no record date is fixed by the Board of Directors, the record date for determining stockholders entitled to notice of and to vote at a meeting of stockholders of the Corporation shall be at the close of business on the day next preceding the day on which notice is given or, if notice is waived, at the close of business on the day next preceding the day on which the meeting is held.

(b) A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders of the Corporation shall apply to any postponement or adjournment of the meeting, provided, that the Board of Directors may fix a new record date for determination of the stockholders entitled to vote at a postponed or adjourned meeting, and in such case shall also fix the record date of the stockholders entitled to notice of such postponed or adjourned meeting at the same or on an earlier date as that fixed for determination of the stockholders entitled to vote at the postponed or adjourned meeting.

SECTION 6 - NOTICES

Section 6.1. Notices.

If mailed, notice to a stockholder of the Corporation shall be deemed given when deposited in the mail, postage prepaid, directed to a stockholder at such stockholder's address as it appears on the records of the Corporation. Without limiting the manner by which notice otherwise may be given effectively to stockholders, any notice to stockholders of the Corporation may be given by electronic transmission in the manner provided in Section 232 of the DGCL.

Section 6.2. Waivers.

A written waiver of any notice, signed by a stockholder or director, or a waiver by electronic transmission by such person or entity, whether given before or after the time of the event for which notice is to be given, shall be deemed equivalent to the notice required to be given to such person or entity. Neither the business nor the purpose of any meeting need be specified in the waiver. Attendance at any meeting shall constitute waiver of notice except attendance for the sole purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened.

SECTION 7 - MISCELLANEOUS

Section 7.1. Corporate Seal.

The Board of Directors may provide a suitable seal, containing the name of the Corporation, which seal shall be in the charge of the Secretary. If and when so directed by the Board of Directors, duplicates of the seal may be kept and used by the Treasurer or by an Assistant Secretary, Assistant Treasurer or the Chief Financial Officer.

Section 7.2. Reliance upon Books, Reports, and Records.

Each director and each member of any committee designated by the Board of Directors of the Corporation shall, in the performance of his or her duties, be fully protected in relying in good faith upon the books and records of the Corporation and upon such information, opinions, reports or statements presented to the Corporation by any of its officers, agents or employees, or committees of the Board of Directors so designated, or by any other person or entity as to matters which such director or committee member reasonably believes are within such other person's or entity's professional or expert competence and that has been selected with reasonable care by or on behalf of the Corporation.

Section 7.3. Fiscal Year.

The fiscal year of the Corporation shall be as fixed by the Board of Directors.

Section 7.4. Time Periods.

In applying any provision of these bylaws that requires that an act be done or not be done a specified number of days before an event or that an act be done during a specified number of days before an event, calendar days shall be used, the day of the doing of the act shall be excluded, and the day of the event shall be included.

SECTION 8 - AMENDMENTS

These bylaws may be altered, amended or repealed in accordance with the certificate of incorporation of the Corporation.

Exhibit 5.1

ROPES & GRAY LLP
THREE EMBARCADERO CENTER
SAN FRANCISCO, CA 94111-4006
WWW.ROPESGRAY.COM

January 17, 2014

Ultragenyx Pharmaceutical Inc.
60 Leveroni Court
Novato, California 94949

Ladies and Gentlemen:

We have acted as counsel to Ultragenyx Pharmaceutical Inc., a Delaware corporation (the "Company") in connection with the Registration Statement on Form S-1 (File No. 333-192244) (as amended through the date hereof, the "Registration Statement") filed by the Company with the Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended (the "Securities Act"), for the registration of 5,564,516 shares of the common stock, $0.001 par value per share, of the Company (the "Securities").

In connection with this opinion letter, we have examined such certificates, documents and records and have made such investigation of fact and such examination of law as we have deemed appropriate in order to enable us to render the opinions set forth herein. In conducting such investigation, we have relied, without independent verification, upon certificates of officers of the Company, public officials and other appropriate persons.

The opinions expressed below are limited to the Delaware General Corporation Law.

Based upon and subject to the foregoing, we are of the opinion that the Securities have been duly authorized and, when issued and delivered pursuant to the Underwriting Agreement and against payment of the consideration set forth therein, will be validly issued, fully paid and non-assessable.

We hereby consent to your filing this opinion as an exhibit to the Registration Statement and to the use of our name therein and in the related prospectus under the caption "Legal Matters." In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ Ropes & Gray LLP

Ropes & Gray LLP

ULTRAGENYX PHARMACEUTICAL INC.
2014 INCENTIVE PLAN

1. DEFINED TERMS

Exhibit A, which is incorporated by reference, defines the terms used in the Plan and sets forth certain operational rules related to those terms.

2. PURPOSE

The Plan has been established to advance the interests of the Company by providing for the grant to Participants of Stock-based and other incentive Awards.

3. ADMINISTRATION

The Administrator has discretionary authority, subject only to the express provisions of the Plan, to interpret the Plan; determine eligibility for and grant Awards; determine, modify or waive the terms and conditions of any Award; prescribe forms, rules and procedures relating to the Plan; and otherwise do all things necessary or appropriate to carry out the purposes of the Plan. Determinations of the Administrator made under the Plan will be conclusive and will bind all parties.

4. LIMITS ON AWARDS UNDER THE PLAN

(a) Number of Shares. The maximum number of shares of Stock that may be delivered in satisfaction of Awards under the Plan is 2,250,000, which includes the number of shares of Stock that were available for grant under the Ultragenyx Pharmaceutical Inc. 2011 Equity Incentive Plan as of the Date of Adoption that are hereby transferred to the Plan or become available for grant under the Ultragenyx Pharmaceutical Inc. 2011 Equity Incentive Plan following the Date of Adoption as a result of the termination, cancellation or forfeiture of awards, plus an annual increase to be added on January 1 of each year, beginning January 1, 2015 through January 1, 2024, equal to the least of (i) 2,500,000 shares of Stock, (ii) 4 percent (4%) of the number of shares of Stock outstanding on a fully diluted basis as of the close of business on the immediately preceding day (calculated by adding to the number of shares of Stock outstanding, all outstanding securities convertible into Stock on such date on an as converted basis), and (iii) a lesser amount determined by the Administrator on or prior to January 1 of a given year. Up to the total number of shares set forth in this Section 4(a) as increased by the provisions of this Section 4(a) above may be issued in satisfaction of ISOs, but nothing in this Section 4(a) will be construed as requiring that any, or any fixed number of, ISOs be awarded under the Plan. The limits set forth in this Section 4(a) shall be construed to comply with Section 422 of the Code. For purposes of this Section 4(a), the number of shares of Stock delivered in satisfaction of Awards will be determined (i) net of shares of Stock underlying the portion of any Award that is settled in cash or the portion of any Stock Option or SAR that expires, terminates or is forfeited prior to the issuance of Stock thereunder, and (ii) by treating as having been delivered the full number of shares covered by any portion of a SAR that is settled in Stock (and not only the number of shares of Stock delivered in settlement). If Awards are forfeited or are terminated for any reason before being exercised or becoming vested, then the shares of Stock underlying such Awards shall again become available for issuance under the

Plan. Any shares withheld from an Award to satisfy the tax withholding obligations with respect to such Award or in payment of the exercise price of an Award requiring exercise shall not again be available for issuance under the Plan.

(b) Type of Shares. Stock delivered by the Company under the Plan may be authorized but unissued Stock or previously issued Stock acquired by the Company. No fractional shares of Stock will be delivered under the Plan.

(c) Section 162(m) Limits. The following additional limits will apply to Awards of the specified type granted, or in the case of Cash Awards, payable to any person in any calendar year, to the extent that such Awards are to be treated as performance-based compensation under Section 162(m) of the Code:

(1) Stock Options: 1,000,000 shares of Stock.

(2) SARs: 1,000,000 shares of Stock.

(3) Awards other than Stock Options, SARs or Cash Awards: 1,000,000 shares of Stock.

(4) Cash Awards: $430,000.

In applying the foregoing limits, (i) all Awards of the specified type granted to the same person in the same calendar year will be aggregated and made subject to one limit; (ii) the limits applicable to Stock Options and SARs refer to the number of shares of Stock subject to those Awards; (iii) the share limit under clause (3) refers to the maximum number of shares of Stock that may be delivered, or the value of which could be paid in cash or other property, under an Award or Awards of the type specified in clause (3) assuming a maximum payout; and (iv) the dollar limit under clause (4) refers to the maximum dollar amount payable under an Award or Awards of the type specified in clause (4) assuming a maximum payout. The foregoing provisions will be construed in a manner consistent with Section 162(m), including, without limitation, where applicable, the rules under Section 162(m) pertaining to permissible deferrals of exempt awards. Any Awards granted to a person in any calendar year that are in excess of the foregoing limits shall not be deemed to be performance-based compensation under Section 162(m).

5. ELIGIBILITY AND PARTICIPATION

The Administrator will select Participants from among key Employees and directors of, and consultants and advisors to, the Company and its Affiliates. Eligibility for ISOs is limited to individuals described in the first sentence of this Section 5 who are employees of the Company or of a “parent corporation” or “subsidiary corporation” of the Company as those terms are defined in Section 424 of the Code. Eligibility for Stock Options other than ISOs is limited to individuals described in the first sentence of this Section 5 who are providing direct services on the date of grant of the Stock Option to the Company or to a subsidiary of the Company that would be described in the first sentence of Treas. Regs. §1.409A-1(b)(5)(iii)(E).

6. RULES APPLICABLE TO AWARDS

(a) All Awards.

(1) Award Provisions. The Administrator will determine the terms of all Awards, subject to the limitations provided herein. By accepting (or, under such rules as the Administrator may prescribe, being deemed to have accepted) an Award, the Participant will be deemed to have agreed to the terms of the Award and the Plan. Notwithstanding any provision of this Plan to the contrary, awards of an acquired company that are converted, replaced or adjusted in connection with the acquisition may contain terms and conditions that are inconsistent with the terms and conditions specified herein, as determined by the Administrator.

(2) Term of Plan. No Awards may be made after ten years from the Date of Adoption, but previously granted Awards may continue beyond that date in accordance with their terms.

(3) Transferability. Neither ISOs nor, except as the Administrator otherwise expressly provides in accordance with the second sentence of this Section 6(a)(3), other Awards may be transferred other than by will or by the laws of descent and distribution. During a Participant's lifetime, ISOs (and, except as the Administrator otherwise expressly provides in accordance with the second sentence of this Section 6(a)(3), SARs and NSOs) may be exercised only by the Participant. The Administrator may permit the gratuitous transfer (*i.e.*, transfer not for value) of Awards other than ISOs to any transferee eligible to be covered by the provisions of Form S-8 (under the Securities Act of 1933), subject to such limitations as the Administrator may impose.

(4) Vesting, etc. The Administrator will determine the time or times at which an Award will vest or become exercisable and the terms on which a Stock Option or SAR will remain exercisable. Without limiting the foregoing, the Administrator may at any time accelerate the vesting or exercisability of an Award, regardless of any adverse or potentially adverse tax or other consequences resulting from such acceleration. Unless the Administrator expressly provides otherwise, however, the following rules will apply if a Participant's Employment ceases:

(A) Immediately upon the cessation of the Participant's Employment and except as provided in (B) and (C) below, each Stock Option and SAR that is then held by the Participant or by the Participant's permitted transferees, if any, will cease to be exercisable and will terminate and all other Awards that are then held by the Participant or by the Participant's permitted transferees, if any, to the extent not already vested will be forfeited.

(B) Subject to (C) and (D) below, all Stock Options and SARs held by the Participant or the Participant's permitted transferees, if any, immediately prior to the cessation of the Participant's Employment, to the extent then exercisable, will remain exercisable for the lesser of (i) a period of three months or (ii) the period ending on the latest date on which such Stock Option or SAR could have been exercised without regard to this Section 6(a)(4), and will thereupon immediately terminate.

(C) All Stock Options and SARs held by a Participant or the Participant's permitted transferees, if any, immediately prior to the Participant's death, to the extent then exercisable, will remain exercisable for the lesser of (i) the one year period ending with the first anniversary of the Participant's death or (ii) the period ending on the latest date on which such Stock Option or SAR could have been exercised without regard to this Section 6(a)(4), and will thereupon immediately terminate.

(D) All Stock Options and SARs (whether or not exercisable) held by a Participant or the Participant's permitted transferees, if any, immediately prior to the cessation of the Participant's Employment will immediately terminate upon such cessation of Employment if the termination is for Cause or occurs in circumstances that in the sole determination of the Administrator would have constituted grounds for the Participant's Employment to be terminated for Cause.

(5) Additional Restrictions. The Administrator may cancel, rescind, withhold or otherwise limit or restrict any Award at any time if the Participant is not in compliance with all applicable provisions of the Award agreement and the Plan, or if the Participant breaches any agreement with the Company or its Affiliates with respect to confidentiality. Without limiting the generality of the foregoing, the Administrator may recover Awards made under the Plan and payments under or gain in respect of any Award to the extent required to comply with Company policy, with Section 10D of the Securities Exchange Act of 1934, as amended, or any stock exchange or similar rule adopted under said Section.

(6) Taxes. The delivery, vesting and retention of Stock, cash or other property under an Award are conditioned upon full satisfaction by the Participant of all tax withholding requirements with respect to the Award. The Administrator will prescribe such rules for the withholding of taxes as it deems necessary. The Administrator may, but need not, hold back shares of Stock from an Award or permit a Participant to tender previously owned shares of Stock in satisfaction of tax withholding requirements (but not in excess of the minimum withholding required by law).

(7) Dividend Equivalents, Etc. The Administrator may provide for the payment of amounts (on terms and subject to conditions established by the Administrator) in lieu of cash dividends or other cash distributions with respect to Stock subject to an Award whether or not the holder of such Award is otherwise entitled to share in the actual dividend or distribution in respect of such Award. Any entitlement to dividend equivalents or similar entitlements will be established and administered either consistent with an exemption from, or in compliance with, the requirements of Section 409A. Dividends or dividend equivalent amounts payable in respect of Awards that are subject to restrictions may be subject to such limits or restrictions as the Administrator may impose.

(8) Rights Limited. Nothing in the Plan will be construed as giving any person the right to continued employment or service with the Company or its Affiliates, or any rights as a stockholder except as to shares of Stock actually issued under the Plan. The loss of existing or potential profit in Awards will not constitute an element of damages in the event of termination of Employment for any reason, even if the termination is in violation of an obligation of the Company or any Affiliate to the Participant.

(9) Section 162(m). In the case of any Performance Award (other than a Stock Option or SAR) intended to qualify for the performance-based compensation exception under Section 162(m), the Administrator will establish the applicable Performance Criterion or Criteria in writing no later than ninety (90) days after the commencement of the period of service to which the performance relates (or at such earlier time as is required to qualify the Award as performance-based under Section 162(m)) and, prior to the event or occurrence (grant, vesting or payment, as the case may be) that is conditioned on the attainment of such Performance Criterion or Criteria, will certify whether it or they have been attained. The preceding sentence will not apply to an Award eligible (as determined by the Administrator) for exemption from the limitations of Section 162(m) by reason of the post-initial public offering transition relief in Section 1.162-27(f) of the Treasury Regulations.

(10) Coordination with Other Plans. Awards under the Plan may be granted in tandem with, or in satisfaction of or substitution for, other Awards under the Plan or awards made under other compensatory plans or programs of the Company or its Affiliates. For example, but without limiting the generality of the foregoing, awards under other compensatory plans or programs of the Company or its Affiliates may be settled in Stock (including, without limitation, Unrestricted Stock) if the Administrator so determines, in which case the shares delivered will be treated as awarded under the Plan (and will reduce the number of shares thereafter available under the Plan in accordance with the rules set forth in Section 4). In any case where an award is made under another plan or program of the Company or its Affiliates and such award is intended to qualify for the performance-based compensation exception under Section 162(m), and such award is settled by the delivery of Stock or another Award under the Plan, the applicable Section 162(m) limitations under both the other plan or program and under the Plan will be applied to the Plan as necessary (as determined by the Administrator) to preserve the availability of the Section 162(m) performance-based compensation exception with respect thereto.

(11) Section 409A. Each Award will contain such terms as the Administrator determines, and will be construed and administered, such that the Award either qualifies for an exemption from the requirements of Section 409A or satisfies such requirements.

(12) Fair Market Value. In determining the fair market value of any share of Stock under the Plan, the Administrator will make the determination in good faith consistent with the rules of Section 422 and Section 409A to the extent applicable.

(b) Stock Options and SARs.

(1) Time and Manner of Exercise. Unless the Administrator expressly provides otherwise, no Stock Option or SAR will be deemed to have been exercised until the Administrator receives a notice of exercise (in form acceptable to the Administrator), which may be an electronic notice, signed (including electronic signature in form acceptable to the Administrator) by the appropriate person and accompanied by any payment required under the Award. A Stock Option or SAR exercised by any person other than the Participant will not be deemed to have been exercised until the Administrator has received such evidence as it may require that the person exercising the Award has the right to do so.

(2) Exercise Price. The exercise price (or the base value from which appreciation is to be measured) of each Award requiring exercise will be no less than 100% (or in the case of an ISO granted to a ten-percent shareholder within the meaning of subsection (b)(6) of Section 422, 110%) of the fair market value of the Stock subject to the Award, determined as of the date of grant, or such higher amount as the Administrator may determine in connection with the grant. No such Award, once granted, may be repriced other than with stockholder approval. Fair market value will be determined by the Administrator consistent with the applicable requirements of Section 422 and Section 409A.

(3) Payment of Exercise Price. Where the exercise of an Award is to be accompanied by payment, payment of the exercise price will be by cash or check acceptable to the Administrator or by such other legally permissible means, if any, as may be acceptable to the Administrator.

(4) Maximum Term. Stock Options and SARs will have a maximum term not to exceed ten (10) years from the date of grant (or five (5) years from the date of grant in the case of an ISO granted to a ten-percent shareholder described in Section 6(b)(2) above); provided, however, that, if a Participant still holding an outstanding but unexercised NSO or SAR ten (10) years from the date of grant (or, in the case of an NSO or SAR with a maximum term of less than ten (10) years, such maximum term) is prohibited by applicable law or a written policy of the Company applicable to similarly situated employees from engaging in any open-market sales of Stock, and if at such time the Stock is publicly traded (as determined by the Administrator), the maximum term of such Award will instead be deemed to expire on the thirtieth (30th) day following the date the Participant is no longer prohibited from engaging in such open market sales.

7. EFFECT OF CERTAIN TRANSACTIONS

(a) Mergers, *etc*. Except as otherwise provided in an Award agreement, the following provisions will apply in the event of a Covered Transaction:

(1) Assumption or Substitution. If the Covered Transaction is one in which there is an acquiring or surviving entity, the Administrator may (but, for the avoidance of doubt, need not) provide (i) for the assumption or continuation of some or all outstanding Awards or any portion thereof or (ii) for the grant of new awards in substitution therefor by the acquiror or survivor or an affiliate of the acquiror or survivor.

(2) Cash-Out of Awards. Subject to Section 7(a)(5) below the Administrator may (but, for the avoidance of doubt, need not) provide for payment (a "cash-out"), with respect to some or all Awards or any portion thereof, equal in the case of each affected Award or portion thereof to the excess, if any, of (A) the fair market value of one share of Stock (as determined by the Administrator in its reasonable discretion) times the number of shares of Stock subject to the Award or such portion, over (B) the aggregate exercise or purchase price, if any, under the Award or such portion (in the case of an SAR, the aggregate base value above which appreciation is measured), in each case on such payment terms (which need not be the same as the terms of payment to holders of Stock) and other terms, and subject to such conditions, as the Administrator determines.

(3) Acceleration of Certain Awards. Subject to Section 7(a)(5) below, the Administrator may (but, for the avoidance of doubt, need not) provide that any Award requiring exercise will become exercisable, in full or in part and/or that the delivery of any shares of Stock remaining deliverable under any outstanding Award of Stock Units (including Restricted Stock Units and Performance Awards to the extent consisting of Stock Units) will be accelerated in full or in part, in each case on a basis that gives the holder of the Award a reasonable opportunity, as determined by the Administrator, following exercise of the Award or the delivery of the shares, as the case may be, to participate as a stockholder in the Covered Transaction.

(4) Termination of Awards Upon Consummation of Covered Transaction. Except as the Administrator may otherwise determine in any case, each Award will automatically terminate (and in the case of outstanding shares of Restricted Stock, will automatically be forfeited) upon consummation of the Covered Transaction, other than Awards assumed or continued pursuant to Section 7(a)(1) above.

(5) Additional Limitations. Any share of Stock and any cash or other property delivered pursuant to Section 7(a)(2) or Section 7(a)(3) above with respect to an Award may, in the discretion of the Administrator, contain such restrictions, if any, as the Administrator deems appropriate to reflect any performance or other vesting conditions to which the Award was subject and that did not lapse (and were not satisfied) in connection with the Covered Transaction. For purposes of the immediately preceding sentence, a cash-out under Section 7(a)(2) above or acceleration under Section 7(a)(3) above will not, in and of itself, be treated as the lapsing (or satisfaction) of a performance or other vesting condition. In the case of Restricted Stock that does not vest and is not forfeited in connection with the Covered Transaction, the Administrator may require that any amounts delivered, exchanged or otherwise paid in respect of such Stock in connection with the Covered Transaction be placed in escrow or otherwise made subject to such restrictions as the Administrator deems appropriate to carry out the intent of the Plan.

(b) Changes in and Distributions With Respect to Stock.

(1) Basic Adjustment Provisions. In the event of a stock dividend, stock split or combination of shares (including a reverse stock split), recapitalization or other change in the Company's capital structure that constitutes an equity restructuring within the meaning of FASB ASC 718, the Administrator will make appropriate adjustments to the maximum number of shares specified in Section 4(a) that may be delivered under the Plan and to the maximum share limits described in Section 4(c), and will also make appropriate adjustments to the number and kind of shares of stock or securities subject to Awards then outstanding or subsequently granted, any exercise prices relating to Awards and any other provision of Awards affected by such change.

(2) Certain Other Adjustments. The Administrator may also make adjustments of the type described in Section 7(b)(1) above to take into account distributions to stockholders other than those provided for in Section 7(a) and 7(b)(1), or any other event, if the Administrator determines that adjustments are appropriate to avoid distortion in the operation of the Plan, having due regard for the qualification of ISOs under Section 422, the requirements of Section 409A, and for the performance-based compensation rules of Section 162(m), where applicable.

(3) Continuing Application of Plan Terms. References in the Plan to shares of Stock will be construed to include any stock or securities resulting from an adjustment pursuant to this Section 7.

8. LEGAL CONDITIONS ON DELIVERY OF STOCK

The Company will not be obligated to deliver any shares of Stock pursuant to the Plan or to remove any restriction from shares of Stock previously delivered under the Plan until: (i) the Company is satisfied that all legal matters in connection with the issuance and delivery of such shares have been addressed and resolved; (ii) if the outstanding Stock is at the time of delivery listed on any stock exchange or national market system, the shares to be delivered have been listed or authorized to be listed on such exchange or system upon official notice of issuance; and (iii) all conditions of the Award have been satisfied or waived. The Company may require, as a condition to exercise of the Award, such representations or agreements as counsel for the Company may consider appropriate to avoid violation of the Securities Act of 1933 or any applicable state or non-U.S. securities law. Any Stock required to be issued to Participants under the Plan will be evidenced in such manner as the Administrator may deem appropriate, including book-entry registration or delivery of stock certificates. In the event that the Administrator determines that Stock certificates will be issued to Participants under the Plan, the Administrator may require that certificates evidencing Stock issued under the Plan bear an appropriate legend reflecting any restriction on transfer applicable to such Stock, and the Company may hold the certificates pending lapse of the applicable restrictions.

9. AMENDMENT AND TERMINATION

The Administrator may at any time or times amend the Plan or any outstanding Award for any purpose which may at the time be permitted by law, and may at any time terminate the Plan as to any future grants of Awards; provided, that except as otherwise expressly provided in the Plan the Administrator may not, without the Participant's consent, alter the terms of an Award so as to affect materially and adversely the Participant's rights under the Award, unless the Administrator expressly reserved the right to do so at the time the Award was granted. Any amendments to the Plan will be conditioned upon stockholder approval only to the extent, if any, such approval is required by law (including the Code and applicable stock exchange requirements), as determined by the Administrator.

10. OTHER COMPENSATION ARRANGEMENTS

The existence of the Plan or the grant of any Award will not in any way affect the Company's right to Award a person bonuses or other compensation in addition to Awards under the Plan.

11. MISCELLANEOUS

(a) Waiver of Jury Trial. By accepting an Award under the Plan and to the extent permitted under applicable law, each Participant waives any right to a trial by jury in any action,

proceeding or counterclaim concerning any rights under the Plan and any Award, or under any amendment, waiver, consent, instrument, document or other agreement delivered or which in the future may be delivered in connection therewith, and agrees that any such action, proceedings or counterclaim will be tried before a court and not before a jury. By accepting an Award under the Plan, each Participant certifies that no officer, representative, or attorney of the Company has represented, expressly or otherwise, that the Company would not, in the event of any action, proceeding or counterclaim, seek to enforce the foregoing waivers. Notwithstanding anything to the contrary in the Plan, nothing herein is to be construed as limiting the ability of the Company and a Participant to agree to submit disputes arising under the terms of the Plan or any Award made hereunder to binding arbitration or as limiting the ability of the Company to require any eligible individual to agree to submit such disputes to binding arbitration as a condition of receiving an Award hereunder.

(b) Limitation of Liability. Notwithstanding anything to the contrary in the Plan, neither the Company, nor any Affiliate, nor the Administrator, nor any person acting on behalf of the Company, any Affiliate, or the Administrator, will be liable to any Participant or to the estate or beneficiary of any Participant or to any other holder of an Award by reason of any acceleration of income, or any additional tax (including any interest and penalties), asserted by reason of the failure of an Award to satisfy the requirements of Section 422 or Section 409A or by reason of Section 4999 of the Code, or otherwise asserted with respect to the Award; provided, that nothing in this Section 11(b) will limit the ability of the Administrator or the Company, in its discretion, to provide by separate express written agreement with a Participant for any payment in connection with any such acceleration of income or additional tax.

12. ESTABLISHMENT OF SUB-PLANS

The Administrator may from time to time establish one or more sub-plans under the Plan for purposes of satisfying applicable blue sky, securities or tax laws of various jurisdictions. The Administrator will establish such sub-plans by adopting supplements to the Plan setting forth (i) such limitations on the Administrator's discretion under the Plan as it deems necessary or desirable and (ii) such additional terms and conditions not otherwise inconsistent with the Plan as it deems necessary or desirable. All supplements so established will be deemed to be part of the Plan, but each supplement will apply only to Participants within the affected jurisdiction (as determined by the Administrator).

13. GOVERNING LAW

(a) Certain Requirements of Corporate Law. Awards will be granted and administered consistent with the requirements of applicable Delaware law relating to the issuance of stock and the consideration to be received therefor, and with the applicable requirements of the stock exchanges or other trading systems on which the Stock is listed or entered for trading, in each case as determined by the Administrator.

(b) Other Matters. Except as otherwise provided by the express terms of an Award agreement, under a sub-plan described in Section 12 or as provided in Section 13(a) above, the provisions of the Plan and of Awards under the Plan and all claims or disputes arising out of or based upon the Plan or any Award under the Plan or relating to the subject matter hereof or

thereof will be governed by and construed in accordance with the domestic substantive laws of the State of Delaware without giving effect to any choice or conflict of laws provision or rule that would cause the application of the domestic substantive laws of any other jurisdiction.

(c) Jurisdiction. By accepting an Award, each Participant will be deemed to (a) have submitted irrevocably and unconditionally to the jurisdiction of the federal and state courts located within the geographic boundaries of the United States District Court for the Northern District of California for the purpose of any suit, action or other proceeding arising out of or based upon the Plan or any Award; (b) agree not to commence any suit, action or other proceeding arising out of or based upon the Plan or an Award, except in the federal and state courts located within the geographic boundaries of the United States District Court for the Northern District of California; and (c) waive, and agree not to assert, by way of motion as a defense or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above-named courts that its property is exempt or immune from attachment or execution, that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that the Plan or an Award or the subject matter thereof may not be enforced in or by such court.

EXHIBIT A

Definition of Terms

The following terms, when used in the Plan, will have the meanings and be subject to the provisions set forth below:

"Administrator": The Compensation Committee, except that the Compensation Committee may delegate (i) to one or more of its members (or one or more other members of the Board (including the full Board)) such of its duties, powers and responsibilities as it may determine; (ii) to one or more officers of the Company the power to grant Awards to the extent permitted by Section 157(c) of the Delaware General Corporation Law; and (iii) to such Employees or other persons as it determines such ministerial tasks as it deems appropriate. In the event of any delegation described in the preceding sentence, the term "Administrator" will include the person or persons so delegated to the extent of such delegation.

"Affiliate": Any corporation or other entity that stands in a relationship to the Company that would result in the Company and such corporation or other entity being treated as one employer under Section 414(b) and Section 414(c) of the Code.

"Award": Any or a combination of the following:

(i) Stock Options.

(ii) SARs.

(iii) Restricted Stock.

(iv) Unrestricted Stock.

(v) Stock Units, including Restricted Stock Units.

(vi) Performance Awards.

(vii) Cash Awards.

(viii) Awards (other than Awards described in (i) through (vii) above) that are convertible into or otherwise based on Stock.

"Board": The Board of Directors of the Company.

"Cash Award": An Award denominated in cash.

"Cause": In the case of any Participant who is party to an employment or severance-benefit agreement that contains a definition of "Cause," the definition set forth in such agreement will apply with respect to such Participant under the Plan. In the case of any other Participant, "Cause" will mean, as determined by the Administrator in its reasonable judgment, (i) a substantial failure of the Participant to perform the Participant's duties and responsibilities to the Company or subsidiaries or substantial negligence in the performance of such duties and

responsibilities; (ii) the commission by the Participant of a felony or a crime involving moral turpitude; (iii) the commission by the Participant of theft, fraud, embezzlement, material breach of trust or any material act of dishonesty involving the Company or any of its subsidiaries; (iv) a significant violation by the Participant of the code of conduct of the Company or its subsidiaries of any material policy of the Company or its subsidiaries, or of any statutory or common law duty of loyalty to the Company or its subsidiaries; (v) material breach of any of the terms of the Plan or any Award made under the Plan, or of the terms of any other agreement between the Company or subsidiaries and the Participant; or (vi) other conduct by the Participant that could be expected to be harmful to the business, interests or reputation of the Company.

"Code": The U.S. Internal Revenue Code of 1986 as from time to time amended and in effect, or any successor statute as from time to time in effect.

"Compensation Committee": The Compensation Committee of the Board.

"Company": Ultragenyx Pharmaceutical Inc.

"Covered Transaction": Any of (i) a consolidation, merger, or similar transaction or series of related transactions, including a sale or other disposition of stock, in which the Company is not the surviving corporation or which results in the acquisition of all or substantially all of the Company's then outstanding common stock by a single person or entity or by a group of persons and/or entities acting in concert, (ii) a sale or transfer of all or substantially all the Company's assets, or (iii) a dissolution or liquidation of the Company. Where a Covered Transaction involves a tender offer that is reasonably expected to be followed by a merger described in clause (i) (as determined by the Administrator), the Covered Transaction will be deemed to have occurred upon consummation of the tender offer.

"Date of Adoption": The earlier of the date the Plan was approved by the Company's stockholders or adopted by the Board, as determined by the Compensation Committee.

"Employee": Any person who is employed by the Company or an Affiliate.

"Employment": A Participant's employment or other service relationship with the Company and its Affiliates, which may include service as a director, consultant or independent contractor. Employment will be deemed to continue, unless the Administrator expressly provides otherwise, so long as the Participant is employed by, or otherwise is providing services in a capacity described in Section 5 to the Company or an Affiliate. If a Participant's employment or other service relationship is with an Affiliate and that entity ceases to be an Affiliate, the Participant's Employment will be deemed to have terminated when the entity ceases to be an Affiliate unless the Participant transfers Employment to the Company or its remaining Affiliates. Notwithstanding the foregoing and the definition of "Affiliate" above, in construing the provisions of any Award relating to the payment of "nonqualified deferred compensation" (subject to Section 409A) upon a termination or cessation of Employment, references to termination or cessation of employment, separation from service, retirement or similar or correlative terms will be construed to require a "separation from service" (as that term is defined in Section 1.409A-1(h) of the Treasury Regulations) from the Company and from all other corporations and trades or businesses, if any, that would be treated as a single "service

recipient" with the Company under Section 1.409A-1(h)(3) of the Treasury Regulations. The Company may, but need not, elect in writing, subject to the applicable limitations under Section 409A, any of the special elective rules prescribed in Section 1.409A-1(h) of the Treasury Regulations for purposes of determining whether a "separation from service" has occurred. Any such written election will be deemed a part of the Plan.

"ISO": A Stock Option intended to be an "incentive stock option" within the meaning of Section 422. Each Stock Option granted pursuant to the Plan will be treated as providing by its terms that it is to be an NSO unless, as of the date of grant, it is expressly designated as an ISO.

"NSO": A Stock Option that is not intended to be an "incentive stock option" within the meaning of Section 422.

"Participant": A person who is granted an Award under the Plan.

"Performance Award": An Award subject to Performance Criteria. The Administrator in its discretion may grant Performance Awards that are intended to qualify for the performance-based compensation exception under Section 162(m) and Performance Awards that are not intended so to qualify.

"Performance Criteria": Specified criteria, other than the mere continuation of Employment or the mere passage of time, the satisfaction of which is a condition for the grant, exercisability, vesting or full enjoyment of an Award. For purposes of Awards that are intended to qualify for the performance-based compensation exception under Section 162(m), a Performance Criterion will mean an objectively determinable measure of performance relating to any, or any combination, of the following (measured either absolutely or by reference to an index or indices and determined either on a consolidated basis or, as the context permits, on a divisional, subsidiary, line of business, project or geographical basis or in combinations thereof): sales; revenues; assets; expenses; earnings from operations; earnings before or after deduction for all or any portion of interest, taxes, depreciation, amortization, incentives, service fees or extraordinary or special items, whether or not on a continuing operations or an aggregate or per share basis; net income or net income per common share (basic or diluted); return on equity, investment, capital or assets; one or more operating ratios; borrowing levels, leverage ratios or credit rating; market share; capital expenditures; cash flow, free cash flow, cash flow return on investment, or net cash provided by operations; stock price, dividends or total stockholder return; development of new technologies or products; sales of particular products or services; economic value created or added; operating margin or profit margin; customer acquisition or retention; raising or refinancing of capital; successful hiring of key individuals; resolution of significant litigation; acquisitions and divestitures (in whole or in part); joint ventures and strategic alliances; spin-offs, split-ups and the like; reorganizations; recapitalizations, restructurings, financings (issuance of debt or equity) or refinancings; or strategic business criteria, consisting of one or more objectives based on the following goals: meeting specified market penetration or value added, product development or introduction (including, without limitation, any clinical trial accomplishments, regulatory or other filings or approvals, or other product development milestones), geographic business expansion, cost targets, cost reductions or savings, customer satisfaction, operating efficiency, acquisition or retention, employee satisfaction, information technology, corporate development (including, without limitation, licenses, innovation, research

or establishment of third party collaborations), manufacturing or process development, legal compliance or risk reduction, patent application or issuance goals, or goals relating to acquisitions or divestitures (in whole or in part), joint ventures or strategic alliances. A Performance Criterion and any targets with respect thereto determined by the Administrator need not be based upon an increase, a positive or improved result or avoidance of loss. To the extent consistent with the requirements for satisfying the performance-based compensation exception under Section 162(m), the Administrator may provide in the case of any Award intended to qualify for such exception that one or more of the Performance Criteria applicable to such Award will be adjusted in an objectively determinable manner to reflect events (for example, but without limitation, acquisitions or dispositions) occurring during the performance period that affect the applicable Performance Criterion or Criteria.

"Plan": The Ultragenyx Pharmaceutical Inc. 2014 Incentive Plan as from time to time amended and in effect.

"Restricted Stock": Stock subject to restrictions requiring that it be redelivered or offered for sale to the Company if specified conditions are not satisfied.

"Restricted Stock Unit": A Stock Unit that is, or as to which the delivery of Stock or cash in lieu of Stock is, subject to the satisfaction of specified performance or other vesting conditions.

"SAR": A right entitling the holder upon exercise to receive an amount (payable in cash or in shares of Stock of equivalent value) equal to the excess of the fair market value of the shares of Stock subject to the right over the base value from which appreciation under the SAR is to be measured.

"Section 409A": Section 409A of the Code.

"Section 422": Section 422 of the Code.

"Section 162(m)": Section 162(m) of the Code.

"Stock": Common stock of the Company, par value $0.001 per share.

"Stock Option": An option entitling the holder to acquire shares of Stock upon payment of the exercise price.

"Stock Unit": An unfunded and unsecured promise, denominated in shares of Stock, to deliver Stock or cash measured by the value of Stock in the future.

"Unrestricted Stock": Stock not subject to any restrictions under the terms of the Award.

Name:	**[—]**
Number of Shares of Stock subject to Stock Option:	**[—]**
Price Per Share:	**$[—]**
Date of Grant:	**[—]**
Vesting Start Date:	**[—]**

ULTRAGENYX PHARMACEUTICAL INC.
2014 INCENTIVE PLAN

INCENTIVE STOCK OPTION AGREEMENT

This agreement (this "Agreement") evidences a stock option granted by Ultragenyx Pharmaceutical Inc. (the "Company") to the undersigned (the "Optionee") pursuant to and subject to the terms of the Ultragenyx Pharmaceutical Inc. 2014 Incentive Plan (as amended from time to time, the "Plan"), which is incorporated herein by reference.

1. Grant of Stock Option. The Company grants to the Optionee on the date set forth above (the "Date of Grant") an option (the "Stock Option") to purchase, on the terms provided herein and in the Plan, up to the number of shares of Stock set forth above (the "Shares") with an exercise price per Share as set forth above, in each case subject to adjustment pursuant to Section 7(b) of the Plan in respect of transactions occurring after the date hereof.

The Stock Option evidenced by this Agreement is intended to be an incentive stock option under Section 422 of the Code and is granted to the Optionee in connection with the Optionee's employment by or service to the Company and its qualifying subsidiaries. For purposes of the immediately preceding sentence, "qualifying subsidiary" means a subsidiary of the Company as to which the Company has a "controlling interest" as described in Treas. Regs. §1.409A-1(b)(5)(iii)(E)(1).

2. Meaning of Certain Terms. Except as otherwise defined herein, all capitalized terms used herein have the same meaning as in the Plan. The following terms have the following meanings:

(a) "Beneficiary" means, in the event of the Optionee's death, the beneficiary named in the written designation (in form acceptable to the Administrator) most recently filed with the Administrator by the Optionee prior to the Optionee's death and not subsequently revoked, or, if there is no such designated beneficiary, the executor or administrator of the Optionee's estate. An effective beneficiary designation will be treated as having been revoked only upon receipt by the Administrator, prior to the Optionee's death, of an instrument of revocation in form acceptable to the Administrator.

(b) "Option Holder" means the Optionee or, if as of the relevant time the Stock Option has passed to a Beneficiary, the Beneficiary.

3. Vesting; Method of Exercise; Treatment of the Stock Option Upon Cessation of Employment.

(a) Vesting. As used herein with respect to the Stock Option or any portion thereof, the term "vest" means to become exercisable and the term "vested" as applied to any outstanding Stock Option means that the Stock Option is then exercisable, subject in each case to the terms of the Plan. Unless earlier terminated, forfeited, relinquished or expired, the Stock Option will vest as to **[—]**. Notwithstanding the foregoing, Shares subject to the Stock Option shall not vest on any vesting date unless the Optionee has remained in continuous Employment from the Date of Grant through such vesting date.

(b) Exercise of the Stock Option. No portion of the Stock Option may be exercised until such portion vests. Each election to exercise any vested portion of the Stock Option will be subject to the terms and conditions of the Plan and shall be in writing, signed by the Option Holder (or in such other form as is acceptable to the Administrator). Each such written exercise election must be received by the Company at its principal office or by such other party as the Administrator may prescribe and be accompanied by payment in full as provided in the Plan. The exercise price may be paid (i) by cash or check acceptable to the Administrator, (ii) to the extent permitted by the Administrator, through a broker-assisted cashless exercise program acceptable to the Administrator, (iii) by such other means, if any, as may be acceptable to the Administrator, or (iv) by any combination of the foregoing permissible forms of payment. In the event that the Stock Option is exercised by a person other than the Optionee, the Company will be under no obligation to deliver shares hereunder unless and until it is satisfied as to the authority of the Option Holder to exercise the Stock Option and compliance with applicable securities laws. The latest date on which the Stock Option or any portion thereof may be exercised will be the 10th anniversary of the Date of Grant (the "Final Exercise Date"). If the Stock Option is not exercised by the Final Exercise Date the Stock Option or any remaining portion thereof will thereupon immediately terminate.

(c) Treatment of the Stock Option Upon Cessation of Employment. If the Optionee's Employment ceases, the Stock Option, to the extent not already vested will be immediately forfeited, and any vested portion of the Stock Option that is then outstanding will be treated as follows:

(i) Subject to clauses (ii) and (iii) below and Section 4 of this Agreement, the Stock Option, to the extent vested immediately prior to the cessation of the Optionee's Employment, will remain

exercisable until the earlier of (A) the date that is three months following the date of such cessation of Employment, or (B) the Final Exercise Date, and except to the extent previously exercised as permitted by this Section 3(c)(i) will thereupon immediately terminate.

(ii) Subject to clauses (iii) below and Section 4 of this Agreement, the Stock Option, to the extent vested immediately prior to the cessation of the Optionee's Employment due to death, will remain exercisable until the earlier of (A) the first anniversary of the Optionee's death or (B) the Final Exercise Date, and except to the extent previously exercised as permitted by this Section 3(c)(ii) will thereupon immediately terminate.

(iii) If the Optionee's Employment is terminated by the Company and its subsidiaries in connection with an act or failure to act constituting Cause (as the Administrator, in its sole discretion, may determine), or such termination occurs in circumstances that in the determination of the Administrator would have entitled the Company and its subsidiaries to terminate the Optionee's Employment for Cause, the Stock Option (whether or not vested) will immediately terminate and be forfeited upon such termination.

4. Forfeiture; Recovery of Compensation.

(a) The Administrator may cancel, rescind, withhold or otherwise limit or restrict the Stock Option at any time if the Optionee is not in compliance with all applicable provisions of this Agreement and the Plan.

(b) By accepting the Stock Option, the Optionee expressly acknowledges and agrees that his or her rights, and those of any permitted transferee of the Stock Option, under the Stock Option to any Stock acquired under the Stock Option or proceeds from the disposition thereof, are subject to Section 6(a)(5) of the Plan (including any successor provision). Nothing in the preceding sentence shall be construed as limiting the general application of Section 8 of this Agreement.

5. Transfer of Stock Option. The Stock Option may not be transferred except as expressly permitted under Section 6(a)(3) of the Plan.

6. Taxes.

(a) Withholding. If at the time this Stock Option is exercised the Company determines that under applicable law and regulations it could be liable for the withholding of any federal or state tax upon exercise or with respect to a disposition of any Stock acquired upon exercise of this Stock Option, the Optionee expressly acknowledges and agrees that the Optionee's rights

hereunder, including the right to be issued shares upon exercise, are subject to the Optionee promptly paying to the Company in cash (or by such other means as may be acceptable to the Administrator in its discretion) all taxes required to be withheld. No shares will be transferred pursuant to the exercise of this Stock Option unless and until the person exercising this Stock Option has remitted to the Company an amount in cash sufficient to satisfy any federal, state, or local withholding tax requirements, or has made other arrangements satisfactory to the Company with respect to such taxes. The Optionee authorizes the Company and its subsidiaries to withhold such amount from any amounts otherwise owed to the Optionee, but nothing in this sentence shall be construed as relieving the Optionee of any liability for satisfying his or her obligation under the preceding provisions of this Section.

(b) Disqualifying Disposition. If the Optionee disposes of the Shares acquired upon exercise of this Stock Option within two years from the Grant Date or one year after such Shares were acquired pursuant to the exercise of this Stock Option, within 15 days of such disposition, the Optionee shall notify the Company in writing of such disposition.

(c) Annual Limit for Incentive Stock Options. To the extent that the aggregate fair market value (determined at the time of grant) of the shares of Stock with respect to which this Stock Option and all other incentive stock options the Optionee holds are exercisable for the first time during any calendar year (under all plans of the Company and its related corporations) exceeds $100,000, the options held by such Optionee or portions thereof that exceed such limit (according to the order in which they were granted in accordance with the regulations under Section 422 of the Code) shall be treated as a non-qualified stock option.

(d) Limitation on Liability. The Optionee acknowledges and agrees that the Company or the Administrator may take any action permitted under the Plan without regard to the effect such action may have on the status of this Stock Option as an incentive stock option under Section 422 of the Code and that such actions may cause this Stock Option to fail to be treated as an incentive stock option under Section 422 of the Code. The Optionee further acknowledges and agrees that neither the Company, nor any of its Affiliates, nor the Administrator, nor any person acting on behalf of the Company, any of its Affiliates, or the Administrator, will be liable to the Optionee or to the estate or beneficiary of the Optionee or to any other person by reason of the failure the Stock Option to satisfy the requirements of Section 422 of the Code.

7. Effect on Employment. Neither the grant of the Stock Option, nor the issuance of Shares upon exercise of the Stock Option, will give the Optionee any right to be retained in the employ or service of the Company or any of its Affiliates, affect the right of the Company or any of its Affiliates to discharge or discipline such Optionee at any time, or affect any right of such Optionee to terminate his or her Employment at any time.

8. Provisions of the Plan. This Agreement is subject in its entirety to the provisions of the Plan, which are incorporated herein by reference. A copy of the Plan as in effect on the Date of Grant has been furnished to the Optionee. By exercising all or any part of the Stock Option, the Optionee agrees to be bound by the terms of the Plan and this Agreement. In the event of any conflict between the terms of this Agreement and the Plan, the terms of the Plan shall control.

9. Acknowledgements. The Optionee acknowledges and agrees that (a) this Agreement may be executed in two or more counterparts, each of which shall be an original and all of which together shall constitute one and the same instrument, (b) this agreement may be executed and exchanged using facsimile, portable document format (PDF) or electronic signature, which, in each case, shall constitute an original signature for all purposes hereunder and (c) such signature by the Company will be binding against the Company and will create a legally binding agreement when this Agreement is countersigned by the Optionee.

[The remainder of this page is intentionally left blank]

IN WITNESS WHEREOF, the Company has caused this Agreement to be executed by its duly authorized officer.

ULTRAGENYX PHARMACEUTICAL INC.

By: _____
Name:
Title:

Dated:

Acknowledged and Agreed:

By _____
[Optionee's Name]

Name:	**[—]**
Number of Shares of Stock subject to Stock Option:	**[—]**
Price Per Share:	**$[—]**
Date of Grant:	**[—]**
Vesting Start Date:	**[—]**

ULTRAGENYX PHARMACEUTICAL INC.
2014 INCENTIVE PLAN

NON-STATUTORY STOCK OPTION AGREEMENT (EMPLOYEES)

This agreement (this "Agreement") evidences a stock option granted by Ultragenyx Pharmaceutical Inc. (the "Company") to the undersigned (the "Optionee") pursuant to and subject to the terms of the Ultragenyx Pharmaceutical Inc. 2014 Incentive Plan (as amended from time to time, the "Plan"), which is incorporated herein by reference.

1. Grant of Stock Option. The Company grants to the Optionee on the date set forth above (the "Date of Grant") an option (the "Stock Option") to purchase, on the terms provided herein and in the Plan, up to the number of shares of Stock set forth above (the "Shares") with an exercise price per Share as set forth above, in each case subject to adjustment pursuant to Section 7(b) of the Plan in respect of transactions occurring after the date hereof.

The Stock Option evidenced by this Agreement is a non-statutory option (that is, an option that does not qualify as an incentive stock option under Section 422 of the Code) and is granted to the Optionee in connection with the Optionee's employment by or service to the Company and its qualifying subsidiaries. For purposes of the immediately preceding sentence, "qualifying subsidiary" means a subsidiary of the Company as to which the Company has a "controlling interest" as described in Treas. Regs. §1.409A-1(b)(5)(iii)(E)(1).

2. Meaning of Certain Terms. Except as otherwise defined herein, all capitalized terms used herein have the same meaning as in the Plan. The following terms have the following meanings:

(a) "Beneficiary" means, in the event of the Optionee's death, the beneficiary named in the written designation (in form acceptable to the Administrator) most recently filed with the Administrator by the Optionee prior to the Optionee's death and not subsequently revoked, or, if there is no such designated beneficiary, the executor or administrator of the Optionee's estate. An effective beneficiary designation will be treated as having been revoked only upon receipt by the Administrator, prior to the Optionee's death, of an instrument of revocation in form acceptable to the Administrator.

(b) "Option Holder" means the Optionee or, if as of the relevant time the Stock Option has passed to a Beneficiary, the Beneficiary.

3. Vesting; Method of Exercise; Treatment of the Stock Option Upon Cessation of Employment.

(a) Vesting. As used herein with respect to the Stock Option or any portion thereof, the term "vest" means to become exercisable and the term "vested" as applied to any outstanding Stock Option means that the Stock Option is then exercisable, subject in each case to the terms of the Plan. Unless earlier terminated, forfeited, relinquished or expired, the Stock Option will vest as to **[—]**. Notwithstanding the foregoing, Shares subject to the Stock Option shall not vest on any vesting date unless the Optionee has remained in continuous Employment from the Date of Grant through such vesting date.

(b) Exercise of the Stock Option. No portion of the Stock Option may be exercised until such portion vests. Each election to exercise any vested portion of the Stock Option will be subject to the terms and conditions of the Plan and shall be in writing, signed by the Option Holder (or in such other form as is acceptable to the Administrator). Each such written exercise election must be received by the Company at its principal office or by such other party as the Administrator may prescribe and be accompanied by payment in full as provided in the Plan. The exercise price may be paid (i) by cash or check acceptable to the Administrator, (ii) to the extent permitted by the Administrator, through a broker-assisted cashless exercise program acceptable to the Administrator, (iii) by such other means, if any, as may be acceptable to the Administrator, or (iv) by any combination of the foregoing permissible forms of payment. In the event that the Stock Option is exercised by a person other than the Optionee, the Company will be under no obligation to deliver shares hereunder unless and until it is satisfied as to the authority of the Option Holder to exercise the Stock Option and compliance with applicable securities laws. The latest date on which the Stock Option or any portion thereof may be exercised will be the 10th anniversary of the Date of Grant (the "Final Exercise Date"); provided, however, if at such time the Optionee is prohibited by applicable law or written Company policy applicable to similarly situated employees from engaging in any open-market sales of Stock, the Final Exercise Date will be automatically extended to thirty (30) days following the date the Optionee is no longer prohibited from engaging in such open-market sales. If the Stock Option is not exercised by the Final Exercise Date the Stock Option or any remaining portion thereof will thereupon immediately terminate.

(c) Treatment of the Stock Option Upon Cessation of Employment. If the Optionee's Employment ceases, the Stock Option, to the extent not already vested will be immediately forfeited, and any vested portion of the Stock Option that is then outstanding will be treated as follows:

(i) Subject to clauses (ii) and (iii) below and Section 4 of this Agreement, the Stock Option, to the extent vested immediately prior to the cessation of the Optionee's Employment, will remain exercisable until the earlier of (A) the date that is three months following the date of such cessation of Employment, or (B) the Final Exercise Date, and except to the extent previously exercised as permitted by this Section 3(c)(i) will thereupon immediately terminate.

(ii) Subject to clauses (iii) below and Section 4 of this Agreement, the Stock Option, to the extent vested immediately prior to the cessation of the Optionee's Employment due to death, will remain exercisable until the earlier of (A) the first anniversary of the Optionee's death or (B) the Final Exercise Date, and except to the extent previously exercised as permitted by this Section 3(c)(ii) will thereupon immediately terminate.

(iii) If the Optionee's Employment is terminated by the Company and its subsidiaries in connection with an act or failure to act constituting Cause (as the Administrator, in its sole discretion, may determine), or such termination occurs in circumstances that in the determination of the Administrator would have entitled the Company and its subsidiaries to terminate the Optionee's Employment for Cause, the Stock Option (whether or not vested) will immediately terminate and be forfeited upon such termination.

4. Forfeiture; Recovery of Compensation.

(a) The Administrator may cancel, rescind, withhold or otherwise limit or restrict the Stock Option at any time if the Optionee is not in compliance with all applicable provisions of this Agreement and the Plan.

(b) By accepting the Stock Option, the Optionee expressly acknowledges and agrees that his or her rights, and those of any permitted transferee of the Stock Option, under the Stock Option to any Stock acquired under the Stock Option or proceeds from the disposition thereof, are subject to Section 6(a)(5) of the Plan (including any successor provision). Nothing in the preceding sentence shall be construed as limiting the general application of Section 8 of this Agreement.

5. Transfer of Stock Option. The Stock Option may not be transferred except as expressly permitted under Section 6(a)(3) of the Plan.

6. Withholding. The exercise of this Stock Option will give rise to "wages" subject to withholding. The Optionee expressly acknowledges and agrees that the Optionee's rights hereunder, including the right to be issued shares upon exercise, are subject to the Optionee promptly paying to the Company in cash (or by such other means as may be acceptable to the Administrator in its discretion) all taxes required to be withheld. No shares will be transferred pursuant to the exercise of this Stock Option unless and until the person exercising this Stock Option has remitted to the Company an amount in cash sufficient to satisfy any federal, state, or local withholding tax requirements, or has made other arrangements satisfactory to the Company with respect to such taxes. The Optionee authorizes the Company and its subsidiaries to withhold such amount from any amounts otherwise owed to the Optionee, but nothing in this sentence shall be construed as relieving the Optionee of any liability for satisfying his or her obligation under the preceding provisions of this Section.

7. Effect on Employment. Neither the grant of the Stock Option, nor the issuance of Shares upon exercise of the Stock Option, will give the Optionee any right to be retained in the employ or service of the Company or any of its Affiliates, affect the right of the Company or any of its Affiliates to discharge or discipline such Optionee at any time, or affect any right of such Optionee to terminate his or her Employment at any time.

8. Provisions of the Plan. This Agreement is subject in its entirety to the provisions of the Plan, which are incorporated herein by reference. A copy of the Plan as in effect on the Date of Grant has been furnished to the Optionee. By exercising all or any part of the Stock Option, the Optionee agrees to be bound by the terms of the Plan and this Agreement. In the event of any conflict between the terms of this Agreement and the Plan, the terms of the Plan shall control.

9. Acknowledgements. The Optionee acknowledges and agrees that (a) this Agreement may be executed in two or more counterparts, each of which shall be an original and all of which together shall constitute one and the same instrument, (b) this agreement may be executed and exchanged using facsimile, portable document format (PDF) or electronic signature, which, in each case, shall constitute an original signature for all purposes hereunder and (c) such signature by the Company will be binding against the Company and will create a legally binding agreement when this Agreement is countersigned by the Optionee.

[The remainder of this page is intentionally left blank]

IN WITNESS WHEREOF, the Company has caused this Agreement to be executed by its duly authorized officer.

ULTRAGENYX PHARMACEUTICAL INC.

By: _____
Name:
Title:

Dated:

Acknowledged and Agreed:

By _____
[Optionee's Name]

Name:	**[—]**
Number of Shares of Stock subject to Stock Option:	**[—]**
Price Per Share:	**$[—]**
Date of Grant:	**[—]**
Vesting Start Date:	**[—]**

ULTRAGENYX PHARMACEUTICAL INC.
2014 INCENTIVE PLAN

NON-STATUTORY STOCK OPTION AGREEMENT (DIRECTORS)

This agreement (this "Agreement") evidences a stock option granted by Ultragenyx Pharmaceutical Inc. (the "Company") to the undersigned (the "Optionee") pursuant to and subject to the terms of the Ultragenyx Pharmaceutical Inc. 2014 Incentive Plan (as amended from time to time, the "Plan"), which is incorporated herein by reference.

1. Grant of Stock Option. The Company grants to the Optionee on the date set forth above (the "Date of Grant") an option (the "Stock Option") to purchase, on the terms provided herein and in the Plan, up to the number of shares of Stock set forth above (the "Shares") with an exercise price per Share as set forth above, in each case subject to adjustment pursuant to Section 7(b) of the Plan in respect of transactions occurring after the date hereof.

The Stock Option evidenced by this Agreement is a non-statutory option (that is, an option that does not qualify as an incentive stock option under Section 422 of the Code) and is granted to the Optionee in connection with the Optionee's employment by or service to the Company and its qualifying subsidiaries. For purposes of the immediately preceding sentence, "qualifying subsidiary" means a subsidiary of the Company as to which the Company has a "controlling interest" as described in Treas. Regs. §1.409A-1(b)(5)(iii)(E)(1).

2. Meaning of Certain Terms. Except as otherwise defined herein, all capitalized terms used herein have the same meaning as in the Plan. The following terms have the following meanings:

(a) "Beneficiary" means, in the event of the Optionee's death, the beneficiary named in the written designation (in form acceptable to the Administrator) most recently filed with the Administrator by the Optionee prior to the Optionee's death and not subsequently revoked, or, if there is no such designated beneficiary, the executor or administrator of the Optionee's estate. An effective beneficiary designation will be treated as having been revoked only upon receipt by the Administrator, prior to the Optionee's death, of an instrument of revocation in form acceptable to the Administrator.

(b) "Option Holder" means the Optionee or, if as of the relevant time the Stock Option has passed to a Beneficiary, the Beneficiary.

3. Vesting; Method of Exercise; Treatment of the Stock Option Upon Cessation of Employment.

(a) Vesting. As used herein with respect to the Stock Option or any portion thereof, the term "vest" means to become exercisable and the term "vested" as applied to any outstanding Stock Option means that the Stock Option is then exercisable, subject in each case to the terms of the Plan. Unless earlier terminated, forfeited, relinquished or expired, the Stock Option will vest as to **[—]**. Notwithstanding the foregoing, Shares subject to the Stock Option shall not vest on any vesting date unless the Optionee has remained in continuous Employment from the Date of Grant through such vesting date.

(b) Exercise of the Stock Option. No portion of the Stock Option may be exercised until such portion vests. Each election to exercise any vested portion of the Stock Option will be subject to the terms and conditions of the Plan and shall be in writing, signed by the Option Holder (or in such other form as is acceptable to the Administrator). Each such written exercise election must be received by the Company at its principal office or by such other party as the Administrator may prescribe and be accompanied by payment in full as provided in the Plan. The exercise price may be paid (i) by cash or check acceptable to the Administrator, (ii) to the extent permitted by the Administrator, through a broker-assisted cashless exercise program acceptable to the Administrator, (iii) by such other means, if any, as may be acceptable to the Administrator, or (iv) by any combination of the foregoing permissible forms of payment. In the event that the Stock Option is exercised by a person other than the Optionee, the Company will be under no obligation to deliver shares hereunder unless and until it is satisfied as to the authority of the Option Holder to exercise the Stock Option and compliance with applicable securities laws. The latest date on which the Stock Option or any portion thereof may be exercised will be the 10th anniversary of the Date of Grant (the "Final Exercise Date"); provided, however, if at such time the Optionee is prohibited by applicable law or written Company policy applicable to similarly situated employees or directors from engaging in any open-market sales of Stock, the Final Exercise Date will be automatically extended to thirty (30) days following the date the Optionee is no longer prohibited from engaging in such open-market sales. If the Stock Option is not exercised by the Final Exercise Date the Stock Option or any remaining portion thereof will thereupon immediately terminate.

(c) Treatment of the Stock Option Upon Cessation of Employment. If the Optionee's Employment ceases, the Stock Option, to the extent not already vested will be immediately forfeited, and any vested portion of the Stock Option that is then outstanding will be treated as follows:

(i) Subject to clauses (ii) and (iii) below and Section 4 of this Agreement, the Stock Option, to the extent vested immediately prior to the cessation of the Optionee's Employment, will remain exercisable until the earlier of (A) the date that is three months following the date of such cessation of Employment, or (B) the Final Exercise Date, and except to the extent previously exercised as permitted by this Section 3(c)(i) will thereupon immediately terminate.

(ii) Subject to clauses (iii) below and Section 4 of this Agreement, the Stock Option, to the extent vested immediately prior to the cessation of the Optionee's Employment due to death, will remain exercisable until the earlier of (A) the first anniversary of the Optionee's death or (B) the Final Exercise Date, and except to the extent previously exercised as permitted by this Section 3(c)(ii) will thereupon immediately terminate.

(iii) If the Optionee's Employment is terminated by the Company and its subsidiaries in connection with an act or failure to act constituting Cause (as the Administrator, in its sole discretion, may determine), or such termination occurs in circumstances that in the determination of the Administrator would have entitled the Company and its subsidiaries to terminate the Optionee's Employment for Cause, the Stock Option (whether or not vested) will immediately terminate and be forfeited upon such termination.

4. Forfeiture; Recovery of Compensation.

(a) The Administrator may cancel, rescind, withhold or otherwise limit or restrict the Stock Option at any time if the Optionee is not in compliance with all applicable provisions of this Agreement and the Plan.

(b) By accepting the Stock Option, the Optionee expressly acknowledges and agrees that his or her rights, and those of any permitted transferee of the Stock Option, under the Stock Option to any Stock acquired under the Stock Option or proceeds from the disposition thereof, are subject to Section 6(a)(5) of the Plan (including any successor provision). Nothing in the preceding sentence shall be construed as limiting the general application of Section 8 of this Agreement.

5. Transfer of Stock Option. The Stock Option may not be transferred except as expressly permitted under Section 6(a)(3) of the Plan.

6. Withholding. The Optionee shall be responsible for satisfying and paying all taxes arising from or due in connection with the Option, its exercise or a disposition of Shares acquired upon exercise of the Option. The Company shall have no liability or obligation related to the foregoing.

7. Effect on Service. Neither the grant of the Stock Option, nor the issuance of Shares upon exercise of the Stock Option, will give the Optionee any right to be retained in the employ or service of the Company or any of its Affiliates, affect the right of the Company or any of its Affiliates to discharge or discipline such Optionee at any time, or affect any right of such Optionee to terminate his or her Employment at any time.

8. Provisions of the Plan. This Agreement is subject in its entirety to the provisions of the Plan, which are incorporated herein by reference. A copy of the Plan as in effect on the Date of Grant has been furnished to the Optionee. By exercising all or any part of the Stock Option, the Optionee agrees to be bound by the terms of the Plan and this Agreement. In the event of any conflict between the terms of this Agreement and the Plan, the terms of the Plan shall control.

9. Acknowledgements. The Optionee acknowledges and agrees that (a) this Agreement may be executed in two or more counterparts, each of which shall be an original and all of which together shall constitute one and the same instrument, (b) this agreement may be executed and exchanged using facsimile, portable document format (PDF) or electronic signature, which, in each case, shall constitute an original signature for all purposes hereunder and (c) such signature by the Company will be binding against the Company and will create a legally binding agreement when this Agreement is countersigned by the Optionee.

[The remainder of this page is intentionally left blank]

IN WITNESS WHEREOF, the Company has caused this Agreement to be executed by its duly authorized officer.

ULTRAGENYX PHARMACEUTICAL INC.

By: _____
Name:
Title:

Dated:

Acknowledged and Agreed:

By _____
[Optionee's Name]

Name:	**[—]**
Number of Restricted Stock Units subject to Award:	**[—]**
Date of Grant:	**[—]**

ULTRAGENYX PHARMACEUTICAL INC.
2014 INCENTIVE PLAN

RESTRICTED STOCK UNIT AGREEMENT (EMPLOYEES)

This agreement (this "Agreement") evidences an award (the "Award") of restricted stock units (the "Restricted Stock Units") granted by Ultragenyx Pharmaceutical Inc. (the "Company") to the undersigned (the "Grantee") pursuant to and subject to the terms of the Ultragenyx Pharmaceutical Inc. 2014 Incentive Plan (as amended from time to time, the "Plan"), which is incorporated herein by reference.

1. Grant of Restricted Stock Units. The Company grants to the Grantee on the date set forth above (the "Date of Grant") an award consisting of the right to receive on the terms provided herein and in the Plan, one share of Stock with respect to each Restricted Stock Unit forming part of the Award, in each case, subject to adjustment pursuant to Section 7(b) of the Plan in respect of transactions occurring after the date hereof.

2. Meaning of Certain Terms. Except as otherwise defined herein, all capitalized terms used herein have the same meaning as in the Plan. [The following terms have the following meanings:

(a) [—].]

3. Vesting. Unless earlier terminated, forfeited, relinquished or expired, the Restricted Stock Units shall vest as follows: [—].

4. Delivery of Stock. The Company shall deliver to the Grantee as soon as practicable upon the vesting of the Restricted Stock Units or any portion thereof, but in all events no later than March 15th of the year following the year in which such Restricted Stock Units vest, one share of Stock with respect to each such vested Restricted Stock Unit, subject to the terms of the Plan and this Agreement.

5. Dividends; Other Rights. The Award shall not be interpreted to bestow upon the Grantee any equity interest or ownership in the Company or any Affiliate prior to the date on which the Company delivers shares of Stock to the Grantee (if any). The Grantee is not entitled to vote any shares of Stock by reason of the granting of this Award or to receive or be credited with any dividends declared and payable on any share of Stock prior to the date on which any such share is delivered to the Grantee hereunder. The Grantee shall have the rights of a shareholder only as to those shares of Stock, if any, that are actually delivered under this Award.

6. Forfeiture; Recovery of Compensation.

(a) The Administrator may cancel, rescind, withhold or otherwise limit or restrict the Award at any time if the Grantee is not in compliance with all applicable provisions of this Agreement and the Plan.

(b) By accepting the Award the Grantee expressly acknowledges and agrees that his or her rights, and those of any permitted transferee of the Award, under the Award to any Stock acquired under the Award or proceeds from the disposition thereof, are subject to Section 6(a)(5) of the Plan (including any successor provision). Nothing in the preceding sentence shall be construed as limiting the general application of Section 10 of this Agreement.

7. Nontransferability. Neither the Award nor the Restricted Stock Units may be transferred except as expressly permitted under Section 6(a)(3) of the Plan.

8. Certain Tax Matters.

(a) The Grantee expressly acknowledges and agrees that the Grantee's rights hereunder, including the right to be issued shares of Stock upon the vesting of the Restricted Stock Units (or any portion thereof), are subject to the Grantee's promptly paying, or in respect of any later requirement of withholding being liable promptly to pay at such time as such withholdings are due, to the Company in cash (or by such other means as may be acceptable to the Administrator in its discretion) all taxes required to be withheld, if any. No shares of Stock will be transferred pursuant to the vesting of the Restricted Stock Units (or any portion thereof) unless and until the Grantee or the person then holding the Award has remitted to the Company an amount in cash sufficient to satisfy any federal, state, or local withholding tax requirements then due and has committed (and by accepting this Award the Grantee shall be deemed to have committed) to pay in cash all tax withholdings required at any later time in respect of the transfer of such shares, or has made other arrangements satisfactory to the Company with respect to such taxes. The Grantee also authorizes the Company and its subsidiaries to withhold such amount from any amounts otherwise owed to the Grantee, but nothing in this sentence shall be construed as relieving the Grantee of any liability for satisfying his or her obligations under the preceding provisions of this Section.

(b) The Grantee expressly acknowledges that because this Award consists of an unfunded and unsecured promise by the Company to deliver Stock in the future, subject to the terms hereof, it is not possible to make a so-called "83(b) election" with respect to the Award.

9. Effect on Employment. Neither the grant of the Award, nor the issuance of Shares upon vesting of the Award, will give the Grantee any right to be retained in the employ or service of the Company or any of its Affiliates, affect the right of the Company or any of its Affiliates to discharge or discipline such Grantee at any time, or affect any right of such Grantee to terminate his or her Employment at any time.

10. Provisions of the Plan. This Agreement is subject in its entirety to the provisions of the Plan, which are incorporated herein by reference. A copy of the Plan as in effect on the Date of Grant has been furnished to the Grantee. By accepting the Award, the Grantee agrees to be bound by the terms of the Plan and this Agreement. In the event of any conflict between the terms of this Agreement and the Plan, the terms of the Plan shall control.

11. Acknowledgments. The Grantee acknowledges and agrees that (a) this Agreement may be executed in two or more counterparts, each of which shall be an original and all of which together shall constitute one and the same instrument, (b) this agreement may be executed and exchanged using facsimile, portable document format (PDF) or electronic signature, which, in each case, shall constitute an original signature for all purposes hereunder and (c) such signature by the Company will be binding against the Company and will create a legally binding agreement when this Agreement is countersigned by the Grantee.

[The remainder of this page is intentionally left blank.]

IN WITNESS WHEREOF, the Company has caused this Agreement to be executed by its duly authorized officer.

ULTRAGENYX PHARMACEUTICAL INC.

By: _____
Name:
Title:

Dated:

Acknowledged and Agreed:

By _____
[Grantee's Name]

Name:	**[—]**
Number of Restricted Stock Units subject to Award:	**[—]**
Date of Grant:	**[—]**

ULTRAGENYX PHARMACEUTICAL INC.
2014 INCENTIVE PLAN

RESTRICTED STOCK UNIT AGREEMENT (DIRECTORS)

This agreement (this "Agreement") evidences an award (the "Award") of restricted stock units (the "Restricted Stock Units") granted by Ultragenyx Pharmaceutical Inc. (the "Company") to the undersigned (the "Grantee") pursuant to and subject to the terms of the Ultragenyx Pharmaceutical Inc. 2014 Incentive Plan (as amended from time to time, the "Plan"), which is incorporated herein by reference.

1. Grant of Restricted Stock Units. The Company grants to the Grantee on the date set forth above (the "Date of Grant") an award consisting of the right to receive on the terms provided herein and in the Plan, one share of Stock with respect to each Restricted Stock Unit forming part of the Award, in each case, subject to adjustment pursuant to Section 7(b) of the Plan in respect of transactions occurring after the date hereof.

2. Meaning of Certain Terms. Except as otherwise defined herein, all capitalized terms used herein have the same meaning as in the Plan. [The following terms have the following meanings:

(a) [—].]

3. Vesting. Unless earlier terminated, forfeited, relinquished or expired, the Restricted Stock Units shall vest as follows: [—].

4. Delivery of Stock. The Company shall deliver to the Grantee as soon as practicable upon the vesting of the Restricted Stock Units or any portion thereof, but in all events no later than March 15th of the year following the year in which such Restricted Stock Units vest, one share of Stock with respect to each such vested Restricted Stock Unit, subject to the terms of the Plan and this Agreement.

5. Dividends; Other Rights. The Award shall not be interpreted to bestow upon the Grantee any equity interest or ownership in the Company or any Affiliate prior to the date on which the Company delivers shares of Stock to the Grantee (if any). The Grantee is not entitled to vote any shares of Stock by reason of the granting of this Award or to receive or be credited with any dividends declared and payable on any share of Stock prior to the date on which any such share is delivered to the Grantee hereunder. The Grantee shall have the rights of a shareholder only as to those shares of Stock, if any, that are actually delivered under this Award.

6. Forfeiture; Recovery of Compensation.

(a) The Administrator may cancel, rescind, withhold or otherwise limit or restrict the Award at any time if the Grantee is not in compliance with all applicable provisions of this Agreement and the Plan.

(b) By accepting the Award the Grantee expressly acknowledges and agrees that his or her rights, and those of any permitted transferee of the Award, under the Award to any Stock acquired under the Award or proceeds from the disposition thereof, are subject to Section 6(a)(5) of the Plan (including any successor provision). Nothing in the preceding sentence shall be construed as limiting the general application of Section 10 of this Agreement.

7. Nontransferability. Neither the Award nor the Restricted Stock Units may be transferred except as expressly permitted under Section 6(a)(3) of the Plan.

8. Certain Tax Matters.

(a) The Grantee shall be responsible for satisfying and paying all taxes arising from or due in connection with the Restricted Stock Units or with the shares of Stock issued upon vesting of the Restricted Stock Units. The Company shall have no liability or obligation related to the foregoing.

(b) The Grantee expressly acknowledges that because this Award consists of an unfunded and unsecured promise by the Company to deliver Stock in the future, subject to the terms hereof, it is not possible to make a so-called “83(b) election” with respect to the Award.

9. Effect on Service. Neither the grant of the Award, nor the issuance of Shares upon vesting of the Award, will give the Grantee any right to be retained in the employ or service of the Company or any of its Affiliates, affect the right of the Company or any of its Affiliates to discharge or discipline such Grantee at any time, or affect any right of such Grantee to terminate his or her Employment at any time.

10. Provisions of the Plan. This Agreement is subject in its entirety to the provisions of the Plan, which are incorporated herein by reference. A copy of the Plan as in effect on the Date of Grant has been furnished to the Grantee. By accepting the Award, the Grantee agrees to be bound by the terms of the Plan and this Agreement. In the event of any conflict between the terms of this Agreement and the Plan, the terms of the Plan shall control.

11. Acknowledgments. The Grantee acknowledges and agrees that (a) this Agreement may be executed in two or more counterparts, each of which shall be an original and all of which together shall constitute one and the same instrument, (b) this agreement may be executed and exchanged using facsimile, portable document format (PDF) or electronic signature, which, in each case, shall constitute an original signature for all purposes hereunder and (c) such signature by the Company will be binding against the Company and will create a legally binding agreement when this Agreement is countersigned by the Grantee.

[The remainder of this page is intentionally left blank.]

IN WITNESS WHEREOF, the Company has caused this Agreement to be executed by its duly authorized officer.

ULTRAGENYX PHARMACEUTICAL INC.

By: _____
Name:
Title:

Dated:

Acknowledged and Agreed:

By _____
[Grantee's Name]

ULTRAGENYX PHARAMACEUTICAL INC.
2014 EMPLOYEE STOCK PURCHASE PLAN

Section 1. Defined Terms

Exhibit A, which is incorporated by reference, defines the terms used in the Plan and sets forth certain operational rules related to those terms.

Section 2. Purpose of Plan

The Plan is intended to enable Eligible Employees of the Company and its Designated Subsidiaries to use payroll deductions to purchase shares of Stock, and thereby acquire an interest in the future of the Company. The Plan is intended to qualify as an "employee stock purchase plan" under Section 423 and to be exempt from the application and requirements of Section 409A of the Code, and is to be construed accordingly.

Section 3. Options to Purchase Stock

Subject to adjustment pursuant to Section 16 of this Plan, the maximum aggregate number of shares of Stock available for purchase pursuant to the exercise of Options granted under the Plan to Eligible Employees will be 600,000 shares, increased on January 1 of each year, beginning January 1, 2015 through January 1, 2024, by the lesser of (a) 1,200,000 shares of Stock, (b) one percent (1%) of the number of shares of Stock outstanding on a fully diluted basis as of the close of business on the immediately preceding day (calculated by adding to the number of shares of Stock outstanding, all outstanding securities convertible into Stock on such date on an as converted basis), or (c) a lesser amount determined by the Administrator on or prior to January 1 of a given year. The shares of Stock to be delivered upon exercise of Options under the Plan may be either shares of authorized but unissued Stock, treasury Stock, or Stock acquired in an open-market transaction, all as the Board may determine. If any Option granted under the Plan expires or terminates for any reason without having been exercised in full or ceases for any reason to be exercisable in whole or in part, the unpurchased shares of Stock subject to such Option will again be available for purchase pursuant to the exercise of Options under the Plan. If, on an Exercise Date, the total number of shares of Stock that would otherwise be subject to Options granted under the Plan exceeds the number of shares then available under the Plan (after deduction of all shares for which Options have been exercised or are then outstanding), the Administrator shall make a pro rata allocation of the shares remaining available for the Option grant in as uniform a manner as shall be practicable and as it shall determine to be equitable. In such event, the Administrator shall give written notice to each Participant of such reduction of the number of Options affected thereby and shall similarly reduce the rate of payroll deductions, if necessary.

Section 4. Eligibility

Subject to Section 13, and any exceptions and limitations set forth in Section 6, or as may be provided elsewhere in the Plan, each Employee who (a) has been continuously employed by the Company for at least forty-five (45) days as of the first day of any Option Period, (b)

customarily works twenty (20) hours or more per week, and (c) satisfies the requirements set forth in the Plan will be an Eligible Employee. In no event, however, may an Employee be granted an Option under the Plan if, immediately after the Option is granted, the Employee would own (or pursuant to Section 424(d) of the Code would be deemed to own) stock possessing five percent (5%) or more of the total combined voting power or value of all classes of stock of the Company or of its Parent or Subsidiaries, if any. The Administrator may, for Option Periods that have not yet commenced, establish additional eligibility requirements not inconsistent with Section 423.

Section 5. Option Periods

The Plan will generally be implemented by a series of "Option Periods". Unless otherwise determined by the Administrator, the Option Periods will be the six-month periods commencing January 1 and ending June 30 and commencing July 1 and ending December 31 of each year. Each June 30 and December 31 will be an "Exercise Date". The Administrator may change the Exercise Date and the commencement date, ending date and duration of the Option Periods to the extent permitted by Section 423.

Section 6. Option Grant

Subject to the limitations set forth in Section 4 and Section 10 and the Maximum Share Limit, on the first day of an Option Period, each Participant automatically will be granted an Option to purchase shares of Stock on the Exercise Date; *provided*, *however*, that no Participant will be granted an Option under the Plan that permits the Participant's right to purchase shares of Stock under the Plan and under all other employee stock purchase plans of the Company and its Parent and Subsidiaries, if any, to accrue at a rate that exceeds $25,000 in Fair Market Value (or such other maximum as may be prescribed from time to time by the Code) for each calendar year during which any Option granted to such Participant is outstanding at any time, as determined in accordance with Section 423(b)(8) of the Code.

Section 7. Method of Participation

To participate in an Option Period, an Eligible Employee must execute and deliver to the Administrator a payroll deduction and participation authorization form in accordance with the procedures prescribed by and in a form acceptable to the Administrator and, in so doing, the Eligible Employee will thereby become a Participant as of the first day of such Option Period. Such an Eligible Employee will remain a Participant with respect to subsequent Option Periods until his or her participation in the Plan is terminated as provided herein. Such payroll deduction and participation authorization must be delivered no later than ten (10) business days prior to the first day of an Option Period, or such other time as specified by the Administrator.

A Participant's authorization will remain in effect for subsequent Option Periods unless the Participant files a new authorization within ten (10) business days prior to the first day of an Option Period (or such other time as specified by the Administrator) or the Participant's Option is cancelled pursuant to Section 13 or Section 14. During an Option Period, payroll deduction authorizations may not be increased or decreased, except that a Participant may terminate his or her payroll deduction authorization by canceling his or her Option in accordance with Section 13.

Each payroll deduction authorization will request payroll deductions in an amount (expressed as a whole percentage) between one percent (1%) and fifteen percent (15%) of the employee's total compensation, including base pay or salary per payroll period.

All payroll deductions made pursuant to this Section 7 will be credited to the Participant's Account. Amounts credited to a Participant's Account will not be required to be set aside in trust or otherwise segregated from the Company's general assets.

Section 8. Method of Payment

A Participant must pay for shares of Stock purchased upon the exercise of an Option with accumulated payroll deductions credited to the Participant's Account.

Section 9. Purchase Price

The Purchase Price of shares of Stock issued pursuant to the exercise of an Option on each Exercise Date will be eighty-five percent (85%) (or such greater percentage specified by the Administrator to the extent permitted under Section 423) of the lesser of (a) the Fair Market Value of a share of Stock on the date on which the Option was granted pursuant to Section 6 (*i.e.*, the first day of the Option Period) and (b) the Fair Market Value of a share of Stock on the date on which the Option is deemed exercised pursuant to Section 10 (*i.e.*, the Exercise Date).

Section 10. Exercise of Options

Subject to the limitations set forth in Section 6 and this Section 10, with respect to each Option Period, on the applicable Exercise Date, each Participant will be deemed to have exercised his or her Option and the accumulated payroll deductions in the Participant's Account will be applied to purchase the greatest number of whole shares of Stock (rounded down to the nearest whole share) that can be purchased with such Account balance at the applicable Purchase Price; *provided*, *however*, that no more than 10,000 shares of Stock may be purchased by a Participant on any Exercise Date, or such lesser number as the Administrator may prescribe in accordance with Section 423 (the "Maximum Share Limit"). As soon as practicable thereafter, shares of Stock so purchased will be placed, in book-entry form, into a record keeping account in the name of the Participant. No fractional shares will be purchased; any payroll deductions accumulated in a Participant's Account that are not sufficient to purchase a full share will be retained in the Participant's Account for the subsequent Option Period, subject to earlier withdrawal by the Participant as provided in Section 13 hereof.

Except as provided above with respect to fractional shares, any amount of payroll deductions in a Participant's Account that are not used for the purchase of shares of Stock, whether because of the Participant's withdrawal from participation in an Option Period or for any other reason, will be returned to the Participant or his or her designated beneficiary or legal representative, as applicable, without interest, as soon as administratively practicable after such withdrawal or other event, as applicable.

If the Participant's accumulated payroll deductions on the Exercise Date would otherwise enable the Participant to purchase shares of Stock in excess of the Maximum Share Limit, the excess of the amount of the accumulated payroll deductions over the aggregate Purchase Price of the shares of Stock actually purchased will be returned to the Participant, without interest, as soon as administratively practicable after such Exercise Date.

Notwithstanding any provision of the Plan to the contrary, no Option may be exercised after 27 months from its grant date.

Section 11. Interest

No interest will be payable on any amount held in the Account of any Participant.

Section 12. Taxes

Payroll deductions will be made on an after-tax basis. The Administrator will have the right, as a condition to exercising an Option, to make such provision as it deems necessary to satisfy its obligations to withhold federal, state, local income or other taxes incurred by reason of the purchase or disposition of shares of Stock under the Plan. In the Administrator's discretion and subject to applicable law, such tax obligations may be paid in whole or in part by delivery of shares of Stock to the Company, including shares of Stock purchased under the Plan, valued at Fair Market Value, but not in excess of the minimum statutory amounts required to be withheld.

Section 13. Cancellation and Withdrawal

A Participant who holds an Option under the Plan may cancel all (but not less than all) of his or her Option and terminate his or her payroll deduction authorization by revoking such authorization by written notice delivered to the Administrator, which, to be effective with respect to an upcoming Exercise Date, must be delivered not later than fifteen (15) business days prior to such Exercise Date (or such other time as specified by the Administrator). Upon such termination and cancellation, the balance in the Participant's Account will be returned to the Participant, without interest, as soon as administratively practicable thereafter. For the avoidance of doubt, a Participant who reduces his or her withholding rate for future payroll periods to zero pursuant to Section 7, will be deemed to have revoked his or her payroll deduction authorization and cancelled his or her Option.

Section 14. Termination of Employment; Death of Participant

Upon the termination of a Participant's employment with the Company (or a Designated Subsidiary, as applicable) for any reason or the death of a Participant during an Option Period prior to an Exercise Date or in the event the Participant ceases to qualify as an Eligible Employee, the Participant will cease to be a Participant, any Option held by him or her under the Plan will be deemed cancelled, the balance in the Participant's Account will be returned to the Participant (or his or her estate or designated beneficiary in the event of the Participant's death), without interest, as soon as administratively practicable thereafter, and the Participant will have no further rights under the Plan.

Section 15. Equal Rights; Participant's Rights Not Transferable

All Participants granted Options under the Plan will have the same rights and privileges consistent with the requirements set forth in Section 423. Any Option granted under the Plan will be exercisable during the Participant's lifetime only by him or her and may not be sold, pledged, assigned, or transferred in any manner. In the event any Participant violates or attempts to violate the terms of this Section 15, as determined by the Administrator in its sole discretion, any Options held by him or her may be terminated by the Company and, upon the return to the Participant of the balance of his or her Account, without interest, all of the Participant's rights under the Plan will terminate.

Section 16. Change in Capitalization; Merger

In the event of any change in the outstanding Stock by reason of a stock dividend, split-up, recapitalization, merger, consolidation, reorganization, or other capital change, the aggregate number and type of shares of Stock available under the Plan, the number and type of shares of Stock granted under any outstanding Options, the maximum number and type of shares of Stock purchasable under any outstanding Option, and the purchase price per share of Stock under any outstanding Option will be appropriately adjusted; *provided*, that no such adjustment will be made unless the Administrator is satisfied that it will not constitute a modification of the rights granted under the Plan or otherwise disqualify the Plan as an employee stock purchase plan under the provisions of Section 423.

In the event of a sale of all or substantially all of the Stock or a sale of all or substantially all of the assets of the Company, or a merger or similar transaction in which the Company is not the surviving corporation or that results in the acquisition of the Company by another person, the Administrator may, in its discretion, (a) if the Company is merged with or acquired by another corporation, provide that each outstanding Option will be assumed or exchanged for a substitute Option granted by the acquiror or successor corporation or by a parent or subsidiary of the acquiror or successor corporation, (b) cancel each outstanding Option and return the balances in Participants' Accounts to the Participants, and/or (c) pursuant to Section 18, terminate the Option Period on or before the date of the proposed sale, merger or similar transaction.

Section 17. Administration of Plan

The Plan will be administered by the Administrator, which will have the right to determine any questions which may arise regarding the interpretation and application of the provisions of the Plan and to make, administer, and interpret such rules and regulations as it deems necessary or advisable. All determinations and decisions by the Administrator regarding the interpretation or application of the Plan will be final and binding on all Participants

The Administrator may specify the manner in which Employees are to provide notices and payroll deduction authorizations. Notwithstanding any requirement of "written notice" herein, the Administrator may permit Employees to provide notices and payroll deduction authorizations electronically.

Section 18. Amendment and Termination of Plan

The Board reserves the right at any time or times to amend the Plan to any extent and in any manner it may deem advisable, by action of the Board; *provided*, that any amendment that would be treated as the adoption of a new plan for purposes of Section 423 will have no force or effect unless approved by the shareholders of the Company within 12 months before or after its adoption.

The Plan may be suspended or terminated at any time by the Company, by action of the Board. In connection therewith, the Board may provide, in its sole discretion, either that outstanding Options will be exercisable either at the Exercise Date for the applicable Option Period or on such earlier date as the Board may specify (in which case such earlier date will be treated as the Exercise Date for the applicable Option Period), or that the balance of each Participant's Account will be returned to the Participant, without interest.

Section 19. Approvals

Shareholder approval will be obtained prior to the date that is 12 months after the date of Board approval. In the event that this Plan has not been approved by the shareholders of the Company prior to January 11, 2015, all Options to purchase shares of Stock under this Plan will be cancelled and become null and void.

Notwithstanding anything herein to the contrary, the obligation of the Company to issue and deliver shares of Stock under the Plan will be subject to the approval required of any governmental authority in connection with the authorization, issuance, sale or transfer of said shares of Stock, to any requirements of any national securities exchange applicable thereto, and to compliance by the Company with other applicable legal requirements in effect from time to time.

Section 20. Participants' Rights as Shareholders and Employees

A Participant will have no rights or privileges as a shareholder of the Company and will not receive any dividends in respect of any shares of Stock covered by an Option granted hereunder until such Option has been exercised, full payment has been made for such shares of Stock, and the shares of Stock have been issued to the Participant.

Nothing contained in the provisions of the Plan will be construed as giving to any Employee the right to be retained in the employ of the Company or any Designated Subsidiary or as interfering with the right of the Company or any Designated Subsidiary to discharge, promote, demote or otherwise re-assign any Employee from one position to another within the Company any Designated Subsidiary at any time.

Section 21. Information Regarding Disqualifying Dispositions.

By electing to participate in the Plan, each Participant agrees to provide such information about any transfer of Stock acquired under the Plan that occurs within two years after the first day of the Option Period in which such Stock was acquired and within one year after the acquisition of such Stock as may be requested by the Company or any Designated Subsidiary in order to assist it in complying with applicable tax laws.

Section 22. Governing Law

Subject to overriding federal law, the Plan will be governed by and interpreted consistently with the laws of the State of Delaware, except as may be necessary to comply with applicable requirements of federal law.

Section 23. Effective Date and Term

This Plan will become effective on upon adoption of the Plan by the Board and no rights will be granted hereunder after the earliest to occur of (a) the Plan's termination by the Company, (b) the issuance of all shares of Stock available for issuance under the Plan or (c) the day before the 10-year anniversary of the date the Board approves the Plan.

EXHIBIT A
Definition of Terms

The following terms, when used in the Plan, will have the meanings and be subject to the provisions set forth below:

"Account": A payroll deduction account maintained in the Participant's name on the books of the Company.

"Administrator": The Compensation Committee of the Board and its delegates, except that the Compensation Committee may delegate its authority under the Plan to a sub-committee comprised of one or more of its members, to members of the Board, or to officers or employees of the Company to the extent permitted by applicable law. In each case references herein to the Administrator refer, as applicable, to such persons or groups so delegated to the extent of such delegation.

"Board": The Board of Directors of the Company.

"Code": The U.S. Internal Revenue Code of 1986 as from time to time amended and in effect, or any successor statute as from time to time in effect.

"Company": Ultragenyx Pharmaceutical Inc.

"Designated Subsidiary": A Subsidiary of the Company that has been designated by the Board or the Compensation Committee of the Board from time to time as eligible to participate in the Plan.

"Effective Date": The date set forth in Section 23 of the Plan.

"Eligible Employee": Any Employee who meets the eligibility requirements set forth in Section 4 of the Plan.

"Employee": Any person who is employed by the Company or a Designated Subsidiary. For the avoidance of doubt, independent consultants and independent contractors are not "Employees."

"Exercise Date": The date set forth in Section 5 of the Plan or otherwise designated by the Administrator with respect to a particular Option Period on which a Participant will be deemed to have exercised the Option granted to him or her for such Option Period.

"Fair Market Value":

(a) If the Stock is readily traded on an established national exchange or trading system (including the Nasdaq Global Market), the closing price of the Stock as reported by the principal exchange on which such Stock is traded; *provided, however,* that if such day is not a trading day, Fair Market Value will mean the reported closing price of the Stock for the immediately preceding day that is a trading day.

(b) If the Stock is not traded on an established national exchange or trading system, the average of the bid and ask prices for such Stock where the bid and ask prices are quoted.

(c) If the Stock cannot be valued pursuant to clauses (a) or (b), the value as determined in good faith by the Board in its sole discretion.

"Maximum Share Limit": The meaning set forth in Section 10 of the Plan.

"Option": An option granted pursuant to the Plan entitling the holder to acquire shares of Stock upon payment of the Purchase Price per share of Stock.

"Option Period": An offering period established in accordance with Section 5 of the Plan.

"Parent": A "parent corporation" as defined in Section 424(e) of the Code.

"Participant": An Eligible Employee who elects to enroll in the Plan.

"Plan": The Ultragenyx Pharmaceutical Inc. 2014 Employee Stock Purchase Plan, as from time to time amended and in effect.

"Purchase Price": The price per share of Stock with respect to an Option Period determined in accordance with Section 9 of the Plan.

"Section 423": Section 423 of the Code and the regulations thereunder.

"Stock": Common stock of the Company, par value $0.001 per share.

"Subsidiary": A "subsidiary corporation" as defined in Section 424(f) of the Code.

Exhibit 10.23

FORM OF INDEMNIFICATION AGREEMENT

THIS INDEMNIFICATION AGREEMENT (this "Agreement") is made as of [ ], by and between Ultragenyx Pharmaceutical Inc., a Delaware corporation (the "Company") and [ ] ("Indemnitee").

RECITALS

WHEREAS, although the Certificate of Incorporation and the Bylaws of the Company provide for indemnification of the officers and directors of the Company and Indemnitee may also be entitled to indemnification pursuant to the General Corporation Law of the State of Delaware ("DGCL"), the DGCL expressly contemplates that contracts may be entered into between the Company and its directors and officers with respect to indemnification of such directors and officers;

WHEREAS, Indemnitee's continued service to the Company substantially benefits the Company;

WHEREAS, the Board of Directors of the Company (the "Board") has determined that it is in the best interest of the Company and that it is reasonably prudent and necessary for the Company to contractually obligate itself to indemnify, and to advance expenses on behalf of, Indemnitee to the fullest extent permitted by applicable law in order to induce Indemnitee to serve or continue to serve the Company free from undue concern that Indemnitee will not be so indemnified or that any indemnification obligation will not be met;

WHEREAS, this Agreement is a supplement to and in furtherance of (a) the Certificate of Incorporation and Bylaws of the Company and (b) the certificate of incorporation, bylaws, partnership agreement or other organizational document, as the case may be, of any Enterprise (as defined below) and (c) any resolutions adopted pursuant thereto, and shall not be deemed a substitute therefor, nor to diminish or abrogate any rights of Indemnitee thereunder;

WHEREAS, Indemnitee does not regard the protection available under the Company's Certificate of Incorporation, Bylaws and insurance or any other Enterprise's certificate of incorporation, bylaws, partnership agreement or other organizational document, as the case may be, and insurance, as adequate in the present circumstances, and may not be willing to serve as a director or officer without adequate protection, and the Company desires Indemnitee to serve in such capacity; and

WHEREAS, Indemnitee is willing to serve, continue to serve and to take on additional service for or on behalf of the Company and certain other Enterprises on the condition that Indemnitee be so indemnified.

NOW, THEREFORE, in consideration of the promises and the covenants contained herein, the Company and Indemnitee do hereby covenant and agree as follows:

AGREEMENT

Section 1. Services to the Company and Certain Other Enterprises. Indemnitee will serve or continue to serve as a director and/or officer of the Company and/or other Enterprises for so long as Indemnitee is duly elected or appointed or until Indemnitee tenders a resignation from such position(s).

Section 2. Definitions. As used in this Agreement:

(a) "Change of Control" means

(1) any "person" (as such term is used in Sections 13(d) and 14(d) of the Exchange Act), becomes the "Beneficial Owner" (as defined in Rule 13d-3 under the Exchange Act), directly or indirectly, of securities of the Company representing more than fifty percent (50%) of the total voting power represented by the Company's then outstanding voting securities (excluding for this purpose any such voting securities held by the Company, any parent or subsidiary of the Company or any employee benefit plan of the Company or any parent or subsidiary of the Company) pursuant to a transaction or a series of transactions which the Board does not approve;

(2) a merger or consolidation of the Company, whether or not approved by the Board, which results in the holders of voting securities of the Company outstanding immediately prior thereto failing to continue to represent (either by remaining outstanding or by being converted into voting securities of the surviving entity) at least fifty percent (50%) of the combined voting power of the voting securities of the Company or such surviving entity outstanding immediately after such merger or consolidation;

(3) the sale or disposition of all or substantially all of the Company's assets (or the consummation of any transaction having similar effect) provided that such sale or disposition is of more than two-thirds (2/3) of the assets of the Company; or

(4) the date a majority of members of the Board is replaced during any twelve (12) month period by directors whose appointment or election is not endorsed by a majority of the members of the Board before the date of such appointment or election.

(5) In any case, a Change of Control under this Section 2(a) must also meet the requirements of a change in ownership or effective control, or a sale of a substantial portion of the Company's assets in accordance with Section 409A(a)(2)(A)(v) of the Internal Revenue Code of 1986, as amended, and the applicable provisions of Treasury Regulation § 1.409A-3.

(b) "Corporate Status" describes the status of a person who is or was a director, officer, employee, agent or fiduciary of the Company or of any other Enterprise.

(c) "Disinterested Director" means a director of the Company who is not and was not a party to the Proceeding in respect of which indemnification is sought by Indemnitee.

(d) "Enterprise" means (i) the Company, (ii) any other corporation, partnership, limited liability company, joint venture, trust, employee benefit plan or other enterprise which is an affiliate or wholly or partially owned subsidiary of the Company and of which Indemnitee is or was serving as a director, trustee, general partner, managing member, officer, employee, agent or fiduciary and (iii) any other corporation, partnership, limited liability company, joint venture, trust, employee benefit plan or other enterprise of which Indemnitee is or was serving at the request of the Company.

(e) "Exchange Act" means the Securities Exchange Act of 1934, as amended.

(f) "Expenses" includes all reasonable attorneys' fees, retainers, court costs, transcript costs, fees of experts, witness fees, travel expenses, duplicating costs, printing and binding costs, telephone charges, postage, delivery service fees, and all other disbursements or expenses of the types customarily incurred in connection with prosecuting, defending, preparing to prosecute or defend, investigating, being or preparing to be a witness in or otherwise participating in, a Proceeding. Expenses shall include such fees and expenses, and costs incurred in connection with any appeal resulting from any Proceeding, including without limitation the premium, security for and other costs relating to any cost bond, supersedeas bond or other appeal bond or its equivalent. Expenses, however, shall not include amounts paid in settlement by Indemnitee or the amount of judgments or fines against Indemnitee.

(g) "Independent Counsel" means, at any time, any law firm, or a member of a law firm, that (i) is experienced in matters of corporation law and (ii) is not, at such time, or has not been in the five years prior to such time, retained to represent: (1) the Company, any Enterprise or Indemnitee in any matter material to either such party (other than with respect to matters concerning Indemnitee under this Agreement, or of other indemnities under similar indemnification agreements), or (2) any other party to the Proceeding giving rise to a claim for indemnification hereunder. Notwithstanding the foregoing, the term "Independent Counsel" shall not include any person who, under the applicable standards of professional conduct then prevailing, would have a conflict of interest in representing either the Company or Indemnitee in an action to determine Indemnitee's rights under this Agreement. The Company agrees to pay the reasonable fees and Expenses of such Independent Counsel and to fully indemnify such counsel against any and all Expenses, claims, liabilities and damages arising out of or relating to this Agreement or its engagement pursuant hereto and to be jointly and severally liable therefor.

(h) "Proceeding" includes any threatened, pending or completed action, suit, arbitration, mediation, alternate dispute resolution mechanism, investigation, inquiry, administrative hearing or any other actual, threatened or completed proceeding, whether brought by or in the right of the Company or otherwise and whether of a civil, criminal, administrative or investigative nature, including without limitation any such proceeding pending as of the date of

this Agreement, in which Indemnitee was, is or will be involved as a party or otherwise by reason of the fact that Indemnitee is or was an officer or director of the Company, by reason of any action taken by Indemnitee or of any action on Indemnitee's part while acting as director or officer of the Company, or by reason of the fact that Indemnitee is or was serving as a director, trustee, general partner, managing member, officer, employee, agent or fiduciary of any other Enterprise, in each case whether or not serving in such capacity at the time any Expense, judgment, fine or amount paid in settlement is incurred for which indemnification, reimbursement or advancement of Expenses can be provided under this Agreement.

Section 3. Indemnity in Third-Party Proceedings. The Company shall be liable to indemnify Indemnitee in accordance with the provisions of this Section 3 if Indemnitee is, or is threatened to be made, a party to or a participant (as a witness or otherwise) in any Proceeding, other than a Proceeding by or in the right of the Company to procure a judgment in its favor. Pursuant to this Section 3, Indemnitee shall be indemnified against all Expenses, judgments, fines and amounts paid in settlement actually and reasonably incurred by Indemnitee or on Indemnitee's behalf in connection with such Proceeding or any claim, issue or matter therein; provided, however, that with respect to the events giving rise to such Proceeding, Indemnitee acted in good faith and in a manner Indemnitee reasonably believed to be in or not opposed to the best interests of the Company and, in the case of a criminal Proceeding, had no reasonable cause to believe that Indemnitee's conduct was unlawful.

Section 4. Indemnity in Proceedings by or in the Right of the Company. The Company shall be liable to indemnify Indemnitee in accordance with the provisions of this Section 4 if Indemnitee is, or is threatened to be made, a party to or a participant (as a witness or otherwise) in any Proceeding by or in the right of the Company to procure a judgment in its favor. Pursuant to this Section 4, Indemnitee shall be indemnified against all Expenses actually and reasonably incurred by Indemnitee or on Indemnitee's behalf in connection with such Proceeding (or any claim, issue or matter therein) if Indemnitee acted in good faith and in a manner Indemnitee reasonably believed to be in or not opposed to the best interests of the Company; provided, however, that no indemnification for Expenses shall be made under this Section 4 in respect of any claim, issue or matter as to which Indemnitee shall have been finally adjudged by a court of competent jurisdiction to be liable to the Company, unless and only to the extent that any such court in which the Proceeding was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, Indemnitee is fairly and reasonably entitled to indemnification.

Section 5. Indemnification for Expenses of a Party Who is Wholly or Partly Successful. Notwithstanding any other provisions of this Agreement, to the extent that Indemnitee is a party to (or a participant in) and is successful, on the merits or otherwise, in any Proceeding, the Company shall be liable to indemnify Indemnitee against all Expenses actually and reasonably incurred by him in connection therewith. If Indemnitee is not wholly successful in such Proceeding but is successful, on the merits or otherwise, as to one or more but less than all claims, issues or matters in such Proceeding, the Company shall be liable to indemnify Indemnitee against all Expenses actually and reasonably incurred by Indemnitee or on Indemnitee's behalf in connection with each successfully resolved claim, issue or matter. For

purposes of this Section and without limitation, the termination of any claim, issue or matter in such a Proceeding by dismissal, with or without prejudice, shall be deemed to be a successful result as to such claim, issue or matter.

Section 6. Indemnification For Expenses of a Witness. Notwithstanding any other provision of this Agreement, to the extent that Indemnitee is, by reason of Indemnitee's Corporate Status, a witness in any Proceeding to which Indemnitee is not a party, the Company shall be liable to indemnify Indemnitee against all Expenses actually and reasonably incurred by Indemnitee or on Indemnitee's behalf in connection therewith.

Section 7. Additional Indemnification.

(a) Notwithstanding any limitation in Sections 3, 4, or 5, the Company shall be liable to indemnify Indemnitee to the fullest extent permitted by law if Indemnitee is a party to, or threatened to be made a party to, any Proceeding (including a Proceeding by or in the right of the Company to procure a judgment in its favor) against all Expenses, judgments, fines and amounts paid in settlement actually and reasonably incurred by Indemnitee in connection with the Proceeding; provided, however, that no indemnity shall be made under this Section 7(a) on account of Indemnitee's conduct which has been adjudicated to constitute a breach of Indemnitee's duty of loyalty to the Company or its shareholders or to constitute an act or omission not in good faith or involving intentional misconduct or a knowing violation of the law.

(b) For purposes of Section 7(a), the meaning of the phrase "to the fullest extent permitted by law" shall include, but not be limited to:

(1) to the fullest extent permitted by any provision of the DGCL that authorizes or contemplates additional indemnification by agreement, or the corresponding provision of any amendment to or replacement of the DGCL; and

(2) to the fullest extent authorized or permitted by any amendments to or replacements of the DGCL adopted after the date of this Agreement that increase the extent to which a corporation may indemnify its officers and directors.

Section 8. Exclusions. Notwithstanding any provision in this Agreement, the Company shall not be obligated under this Agreement to make any indemnity payment, or to advance any expenses, in connection with any claim made against Indemnitee:

(a) for which payment has actually been received by or on behalf of Indemnitee under any insurance policy or other indemnity provision, except with respect to any excess beyond the amount actually received under any insurance policy or other indemnity provision;

(b) for an accounting of profits made from the purchase and sale (or sale and purchase) by Indemnitee of securities of the Company within the meaning of Section 16(b) of the Exchange Act or similar provisions of state statutory law or common law; provided, however, that notwithstanding any limitation on the Company's obligation to provide indemnification set

forth in this Section 8(b) or elsewhere, Indemnitee shall be entitled to receive advancement of Expenses hereunder with respect to any such claim unless and until a court having jurisdiction over the claim shall have made a final judicial determination (as to which all rights of appeal therefrom have been exhausted or lapsed) that Indemnitee has violated said statute; or

(c) in connection with any Proceeding (or any part of any Proceeding) initiated by Indemnitee, including any Proceeding (or any part of any Proceeding) initiated by Indemnitee against the Company or its directors, officers, employees or other indemnitees, unless (i) such indemnification is expressly required to be made by applicable law, (ii) the Proceeding was authorized by the Board, (iii) such indemnification is provided by the Company, in its sole discretion, pursuant to the powers vested in the Company under the DGCL, or (iv) such indemnification is required to be made pursuant to Section 13 of this Agreement.

Section 9. Advancement of Expenses; Defense of Claim.

(a) Except as otherwise provided herein, the Company shall be obligated to advance any and all Expenses incurred by Indemnitee in connection with any Proceeding within thirty (30) days after the receipt by the Company of a statement or statements requesting such advances from time to time, whether prior to or after final disposition of any Proceeding. Such statement or statements shall reasonably evidence the Expenses incurred by Indemnitee and shall include or be preceded by a written undertaking by or on behalf of Indemnitee to repay any Expenses advanced to the extent and only to the extent that (i) it is ultimately determined that Indemnitee is not entitled to be indemnified by the Company or (ii) the Expenses advanced pursuant to this Section 9 exceed the Expenses actually incurred in connection with such Proceeding.

(b) Any advances (i) shall be unsecured and interest free; (ii) shall be made without regard to Indemnitee's ability to repay the advances and without regard to Indemnitee's ultimate entitlement to indemnification under the other provisions of this Agreement; and (iii) shall include any and all reasonable Expenses incurred pursuing an action to enforce this right of advancement, including Expenses incurred preparing and forwarding statements to the Company to support the advances claimed.

(c) The Company will be entitled to participate reasonably in the Proceeding at its own expense.

Section 10. Procedure for Notification and Requests for Advancement and Indemnification.

(a) Notification. To obtain advancement of Expenses and/or indemnification under this Agreement, Indemnitee shall, not later than thirty (30) days after receipt by Indemnitee of notice of the commencement of any Proceeding, except for Proceedings pending as of the date of this Agreement, submit to the Company written notification of the Proceeding; with regard to Proceedings pending as of the date of this Agreement, Indemnitee shall submit to the Company written notification not later than thirty (30) days after the date of this Agreement. The omission to notify the Company will relieve the Company of its advancement or

indemnification obligations under this Agreement only to the extent the Company can establish that such omission to notify resulted in actual prejudice to it, and the omission to notify the Company will, in any event, not relieve the Company from any liability which it may have to indemnify Indemnitee otherwise than under this Agreement. The Secretary of the Company shall, promptly upon receipt of notification from Indemnitee pursuant to this Section 10(a), advise the Board in writing that Indemnitee has provided such notification.

(b) Expense Request. Subject to Section 9, to obtain advancement of Expenses under this Agreement, Indemnitee shall submit to the Company a written request therefor, together with such invoices or other supporting information as may be reasonably requested by the Company and reasonably available to Indemnitee, and, only to the extent required by applicable law which cannot be waived, an unsecured written undertaking to repay amounts advanced. The Company shall make advance payment of Expenses to Indemnitee no later than thirty (30) days after receipt of the written request for advancement (and each subsequent request for advancement) by Indemnitee. If, at the time of receipt of any such written request for advancement of Expenses, the Company has director and officer insurance policies in effect, the Company will promptly notify the relevant insurers in accordance with the procedures and requirements of such policies. The Company shall thereafter keep such director and officer insurers informed of the status of the Proceeding or other claim, as appropriate to secure insurance coverage of Indemnitee for such claim.

(c) Indemnification Request. In order to obtain indemnification under this Agreement, Indemnitee shall, anytime at Indemnitee's discretion following notification by Indemnitee of the commencement of any Proceeding pursuant to Section 10(a) of this Agreement and consistent with the time period for the duration of this Agreement as set forth in Section 15 of this Agreement, submit to the Company a written request for indemnification pursuant to this Section 10(c), including therein or therewith such documentation and information as is reasonably available to Indemnitee and is reasonably necessary to determine whether and to what extent Indemnitee is entitled to indemnification. No determination of Indemnitee's entitlement to indemnification shall be made until such written request for a determination is submitted by Indemnitee to the Company pursuant to this Section 10(c). The failure to submit a written request to the Company will relieve the Company of its indemnification obligations under this Agreement only to the extent the Company can establish that such failure to make a written request resulted in actual prejudice to it, and the failure to make a written request will not relieve the Company from any liability which it may have to indemnify Indemnitee otherwise than under this Agreement. The Secretary of the Company shall, promptly upon receipt of such a request for indemnification, advise the Board in writing that Indemnitee has requested indemnification. Upon submission of a written request for indemnification by Indemnitee pursuant to this Section 10(c), Indemnitee's entitlement to indemnification shall be determined according to Section 11 of this Agreement.

Section 11. Procedure Upon Application for Indemnification.

(a) Upon receipt of Indemnitee's written request for indemnification pursuant to Section 10(c) of this Agreement, a determination with respect thereto shall be made in the

specific case by one of the following four methods, which shall be at the election of the Board in its sole discretion: (i) by a majority vote of the Disinterested Directors, even though less than a quorum, (ii) by a committee of Disinterested Directors designated by a majority vote of the Disinterested Directors, even though less than a quorum, (iii) if there are no Disinterested Directors or if the Disinterested Directors so direct, by Independent Counsel in a written opinion to the Board, a copy of which shall be delivered to Indemnitee or (iv) by a majority vote of the stockholders of the Company. Notwithstanding the above, if a determination with respect to Indemnitee's right to indemnification is to be made following a Change of Control, such determination shall be made in the specific case by Independent Counsel in a written opinion to the Board, a copy of which shall be delivered to Indemnitee. If it is so determined that Indemnitee is entitled to indemnification, payment to Indemnitee shall be made within ten (10) days after such determination. Indemnitee shall reasonably cooperate with the person, persons or entity making such determination with respect to Indemnitee's entitlement to indemnification, including providing to such person, persons or entity upon reasonable advance request any documentation or information which is not privileged or otherwise protected from disclosure and which is reasonably available to Indemnitee and reasonably necessary to such determination. Any costs or expenses (including attorneys' fees and disbursements) incurred by Indemnitee in so cooperating with the Disinterested Directors or Independent Counsel, as the case may be, making such determination shall be advanced and borne by the Company (irrespective of the determination as to Indemnitee's entitlement to indemnification) and the Company is liable to indemnify and hold Indemnitee harmless therefrom.

(b) In the event the determination of entitlement to indemnification is to be made by Independent Counsel pursuant to Section 11(a) hereof, the Independent Counsel shall be selected as provided in this Section 11(b). The Independent Counsel shall be selected by the Board and the Board shall provide written notice to the Indemnitee of the identity of the Independent Counsel so selected. Indemnitee may, within ten (10) days after such written notice of selection shall have been received, deliver to the Company a written objection to such selection; provided, however, that such objection may be asserted only on the ground that the Independent Counsel so selected does not meet the requirements of "Independent Counsel" as defined in Section 2 of this Agreement, and the objection shall set forth with particularity the factual basis of such assertion. Absent a proper and timely objection, the person so selected shall act as Independent Counsel. If a written objection is so made and substantiated, the Independent Counsel so selected may not serve as Independent Counsel unless and until such objection is withdrawn or a court of competent jurisdiction has determined that such objection is without merit. If, within twenty (20) days after submission by Indemnitee of a written request for indemnification pursuant to Section 10(c) hereof, no Independent Counsel shall have been selected and not objected to, either the Company or Indemnitee may petition a court of competent jurisdiction for resolution of any objection which shall have been made by the Indemnitee to the Company's selection of Independent Counsel and/or for the appointment as Independent Counsel of a person selected by such court or by such other person as such court shall designate, and the person with respect to whom all objections are so resolved or the person so appointed shall act as Independent Counsel under Section 11(a) hereof. Upon the due commencement of any judicial proceeding or arbitration pursuant to Section 13(a) of this Agreement, Independent Counsel shall be discharged and relieved of any further responsibility in

such capacity (subject to the applicable standards of professional conduct then prevailing). The Company shall pay all reasonable fees and expenses incident to the procedures of this Section 11(b), regardless of the manner in which such Independent Counsel was selected or appointed.

Section 12. Presumptions and Effect of Certain Proceedings.

(a) In making a determination with respect to entitlement to indemnification hereunder, the person or persons or entity making such determination shall presume that Indemnitee is entitled to indemnification under this Agreement if Indemnitee has submitted a notice and a request for indemnification in accordance with Section 10 of this Agreement. Anyone seeking to overcome this presumption shall have the burden of proof and the burden of persuasion by a preponderance of the evidence. Neither the failure of the Company (including by the Board) or of Independent Counsel to have made a determination prior to the commencement of any judicial proceeding or arbitration pursuant to this Agreement that indemnification is proper in the circumstances because Indemnitee has met the applicable standard of conduct, nor an actual determination by the Company (including by the Board) or by Independent Counsel that Indemnitee has not met such applicable standard of conduct, shall be a defense to the action or create a presumption that Indemnitee has not met the applicable standard of conduct.

(b) If the person, persons or entity empowered or selected under Section 11 of this Agreement to determine whether Indemnitee is entitled to indemnification shall not have made a determination within sixty (60) days after receipt by the Company of Indemnitee's written request for indemnification pursuant to Section 10(c) of this Agreement, the requisite determination of entitlement to indemnification shall be deemed to have been made and Indemnitee shall be entitled to such indemnification, absent (i) a misstatement by Indemnitee of a material fact, or an omission of a material fact necessary to make Indemnitee's statement not materially misleading, in connection with the request for indemnification, or (ii) a prohibition of such indemnification under applicable law; provided, however, that such 60-day period may be extended for a reasonable time, not to exceed an additional thirty (30) days, if the person, persons or entity making the determination with respect to entitlement to indemnification in good faith requires such additional time for the obtaining or evaluating of documentation and/or information relating thereto.

(c) The termination of any Proceeding or of any claim, issue or matter therein, by judgment, order, settlement or conviction, or upon a plea of *nolo contendere* or its equivalent, shall not (except as otherwise expressly provided in this Agreement) of itself adversely affect the right of Indemnitee to indemnification or create a presumption that Indemnitee did not act in good faith and in a manner which Indemnitee reasonably believed to be in or not opposed to the best interests of the Company or, with respect to any criminal Proceeding, that Indemnitee had reasonable cause to believe that Indemnitee's conduct was unlawful.

(d) Reliance as Safe Harbor. For purposes of any determination of good faith, Indemnitee shall be deemed to have acted in good faith if Indemnitee's action or failure to act is based on the records or books of account of any Enterprise, including financial statements, or on information supplied to Indemnitee by the officers of the Enterprise in the course of their duties,

or on the advice of legal counsel for the Enterprise or on information or records given or reports made to the Enterprise by an independent certified public accountant or by an appraiser or other expert selected by the Enterprise. The provisions of this Section 12(d) shall not be deemed to be exclusive or to limit in any way the other circumstances in which Indemnitee may be deemed or found to have met the applicable standard of conduct set forth in this Agreement.

(e) Actions of Others. The knowledge and/or actions, or failure to act, of any other director, partner, managing member, officer, agent, employee or trustee of the Enterprise shall not be imputed to Indemnitee for purposes of determining Indemnitee's right to indemnification under this Agreement.

Section 13. Remedies of Indemnitee.

(a) In the event that (i) a determination is made pursuant to Section 11 of this Agreement that Indemnitee is not entitled to indemnification under this Agreement, (ii) advancement of Expenses is not timely made pursuant to Section 9 or 10(b) of this Agreement, (iii) payment of indemnification is not made pursuant to Section 5, 6, 7 or the last sentence of Section 11(a) of this Agreement within ten (10) days after receipt by the Company of a written request therefor, or (iv) payment of indemnification pursuant to Section 3 or 4 of this Agreement is not made within ten (10) days after a determination has been made that Indemnitee is entitled to indemnification, Indemnitee shall be entitled to seek an adjudication by a court of competent jurisdiction as to Indemnitee's entitlement to such indemnification or advancement of Expenses. Alternatively, Indemnitee, at Indemnitee's option, may seek an award in arbitration to be conducted by a single arbitrator pursuant to the Commercial Arbitration Rules of the American Arbitration Association. The Company shall not oppose Indemnitee's right to seek any such adjudication or award in arbitration.

(b) In the event that a determination shall have been made pursuant to Section 11(a) of this Agreement that Indemnitee is not entitled to indemnification, any judicial proceeding or arbitration, commenced pursuant to this Section 13, shall be conducted in all respects as a de novo trial or arbitration, on the merits, and Indemnitee shall not be prejudiced by reason of that adverse determination. In any judicial proceeding or arbitration commenced pursuant to this Section 13, in the event that the person, persons or entity empowered or selected under Section 11 of this Agreement to determine whether Indemnitee is entitled to indemnification has not made such a determination within the time period provided for under Section 12(b) of this Agreement, the Company shall stipulate and may not contest that Indemnitee acted in good faith and in a manner Indemnitee reasonably believed to be in or not opposed to the best interests of the Company, and, with respect to any criminal action or Proceeding, had no reasonable cause to believe Indemnitee's conduct was unlawful.

(c) If a determination shall have been made pursuant to Section 11(a) of this Agreement that Indemnitee is entitled to indemnification, the Company shall be bound by such determination in any judicial proceeding or arbitration commenced pursuant to this Section 13, absent (i) a misstatement by Indemnitee of a material fact, or an omission of a material fact necessary to make Indemnitee's statement not materially misleading, in connection with the request for indemnification, or (ii) a prohibition of such indemnification under applicable law.

(d) In the event that Indemnitee is a party to a judicial proceeding or arbitration pursuant to this Section 13 concerning Indemnitee's rights under, or to recover damages for breach of, this Agreement, Indemnitee shall be entitled to recover from the Company, and shall be indemnified by the Company against, any and all Expenses actually and reasonably incurred by him in such judicial adjudication or arbitration. If it shall be determined in said judicial adjudication or arbitration that Indemnitee is entitled to receive part but not all of the indemnification or advancement of Expenses sought, Indemnitee shall be entitled to recover from the Company (who shall be liable therefor), and shall be indemnified by the Company against, any and all Expenses reasonably incurred by Indemnitee in connection with such judicial adjudication or arbitration.

(e) The Company shall be precluded from asserting in any judicial proceeding or arbitration commenced pursuant to this Section 13 that the procedures and presumptions of this Agreement are not valid, binding and enforceable and shall stipulate in any such court or before any such arbitrator that the Company is bound by all the provisions of this Agreement. The Company shall be liable to indemnify Indemnitee against any and all Expenses and, if requested by Indemnitee, shall (within ten (10) days after receipt by the Company of a written request therefor) advance such Expenses to Indemnitee that are incurred by Indemnitee in connection with any judicial adjudication or arbitration involving Indemnitee for indemnification or advancement of Expenses from the Company under this Agreement or under any directors' and officers' liability insurance policies maintained by the Company, regardless of whether Indemnitee ultimately is determined to be entitled to such indemnification, advancement of Expenses or insurance recovery, as the case may be.

Section 14. Non-Exclusivity; Survival of Rights; Insurance.

(a) The rights of indemnification and to receive advancement of Expenses as provided by this Agreement shall not be deemed exclusive of any other rights to which Indemnitee may at any time be entitled under applicable law, the Company's or any other Enterprise's Certificate of Incorporation, Bylaws or similar organizational documents, any agreement, a vote of stockholders or a resolution of directors or otherwise. No amendment, alteration or repeal of this Agreement or of any provision hereof shall limit or restrict any right of Indemnitee under this Agreement in respect to any action taken or omitted by such Indemnitee in Indemnitee's Corporate Status prior to such amendment, alteration or repeal. To the extent that a change in Delaware law, whether by statute or judicial decision, permits greater indemnification or advancement of Expenses than would be afforded currently under the Company's or any other Enterprise's Certificate of Incorporation, Bylaws and this Agreement, it is the intent of the parties hereto that Indemnitee shall enjoy by this Agreement the greater benefits so afforded by such change. No right or remedy herein conferred is intended to be exclusive of any other right or remedy, and every other right and remedy shall be cumulative and in addition to every other right and remedy given hereunder or now or hereafter existing at law or in equity or otherwise. The assertion or employment of any right or remedy hereunder, or otherwise, shall not prevent the concurrent assertion or employment of any other right or remedy.

(b) To the extent that the Company maintains an insurance policy or policies providing liability insurance for directors, partners, managing members, officers, employees, agents or trustees of the Company or of any other Enterprise, Indemnitee shall be covered by such policy or policies in accordance with its or their terms to the maximum extent of the coverage available for any such director, partner, managing member, officer, employee, agent or trustee under such policy or policies. If, at the time of the receipt of a notice of a claim pursuant to Section 10(a) hereof, the Company has director and officer liability insurance in effect, the Company shall give prompt notice of the commencement of such Proceeding to the insurers in accordance with the procedures set forth in the respective policies. The Company shall thereafter take all necessary or desirable action to cause such insurers to pay, on behalf of Indemnitee, all amounts payable as a result of such Proceeding in accordance with the terms of such policies.

(c) The Company shall not be liable under this Agreement to make any payment of amounts otherwise indemnifiable (or for which advancement is provided hereunder) hereunder only to the extent that Indemnitee has otherwise actually received such payment under any insurance policy, contract, agreement or otherwise.

(d) The Company's obligation hereunder to indemnify, or advance Expenses to, Indemnitee who was, is or will be serving as a director, partner, managing member, officer, employee, agent or trustee of any other Enterprise shall be reduced by any amount Indemnitee has actually received as indemnification or advancement of Expenses from such other Enterprise.[1]

Section 15. Duration of Agreement. This Agreement shall continue until and terminate upon the later of: (a) ten (10) years after the date that Indemnitee shall have ceased to serve as a director or officer of the Company or as a director, general partner, managing member, officer, employee, agent, fiduciary or trustee of any other Enterprise; or (b) one (1) year after the final termination (i) of any Proceeding (including any rights of appeal) then pending in respect of

[1] [INSERT TO THE EXTENT APPLICABLE] [Notwithstanding the foregoing, the Company hereby acknowledges that Indemnitee has certain rights to indemnification, advancement of expenses and/or insurance provided by [Name of Fund/Sponsor] and certain of [its][their] affiliates (collectively, the "Fund Indemnitors"). The Company hereby agrees (i) that it is the indemnitor of first resort (*i.e.*, its obligations to Indemnitee are primary and any obligation of the Fund Indemnitors to advance expenses or to provide indemnification for the same expenses or liabilities incurred by Indemnitee are secondary), (ii) that it shall be required to advance the full amount of expenses incurred by Indemnitee and shall be liable for the full amount of all Expenses, judgments, penalties, fines and amounts paid in settlement to the extent legally permitted and as required by the terms of this Agreement and the Certificate of Incorporation or Bylaws of the Company (or any other agreement between the Company and Indemnitee), without regard to any rights Indemnitee may have against the Fund Indemnitors, and (iii) that it irrevocably waives, relinquishes and releases the Fund Indemnitors from any and all claims against the Fund Indemnitors for contribution, subrogation or any other recovery of any kind in respect thereof. The Company further agrees that no advancement or payment by the Fund Indemnitors on behalf of Indemnitee with respect to any claim for which Indemnitee has sought indemnification from the Company shall affect the foregoing and the Fund Indemnitors shall have a right of contribution and/or be subrogated to the extent of such advancement or payment to all of the rights of recovery of Indemnitee against the Company. The Company and Indemnitee agree that the Fund Indemnitors are third party beneficiaries of the terms of this Section 14(d).]

which Indemnitee requests indemnification or advancement of Expenses hereunder and (ii) of any judicial proceeding or arbitration pursuant to Section 13 of this Agreement (including any rights of appeal) involving Indemnitee. This Agreement shall be binding upon the Company and its successors and assigns and shall inure to the benefit of Indemnitee and Indemnitee's heirs, executors and administrators.

Section 16. Severability. If any provision or provisions of this Agreement shall be held to be invalid, illegal or unenforceable for any reason whatsoever: (a) the validity, legality and enforceability of the remaining provisions of this Agreement (including, without limitation, each portion of any Section of this Agreement containing any such provision held to be invalid, illegal or unenforceable, that is not itself invalid, illegal or unenforceable) shall not in any way be affected or impaired thereby and shall remain enforceable to the fullest extent permitted by law; (b) such provision or provisions shall be deemed reformed to the extent necessary to conform to applicable law and to give the maximum effect to the intent of the parties hereto; and (c) to the fullest extent possible, the provisions of this Agreement (including, without limitation, each portion of any section of this Agreement containing any such provision held to be invalid, illegal or unenforceable, that is not itself invalid, illegal or unenforceable) shall be construed so as to give effect to the intent manifested thereby.

Section 17. Enforcement.

(a) The Company expressly confirms and agrees that it has entered into this Agreement and assumed the obligations imposed on it hereby in order to induce Indemnitee to continue to serve as a director or officer of the Company, and the Company acknowledges that Indemnitee is relying upon this Agreement in serving as a director or officer of the Company.

(b) This Agreement constitutes the entire agreement between the parties hereto with respect to the subject hereof and supersedes any and all prior agreements and understandings, oral, written and implied, between the parties hereto with respect to the subject matter hereof.

Section 18. Modification and Waiver. No supplement, modification or amendment of this Agreement shall be binding unless executed in writing by the parties hereto. No waiver of any of the provisions of this Agreement shall be deemed or shall constitute a wavier of any other provisions of this Agreement nor shall any waiver constitute a continuing waiver.

Section 19. Notice by Indemnitee. Indemnitee agrees promptly to notify the Company in writing upon being served with any summons, citation, subpoena, complaint, indictment, information or other document relating to any Proceeding or matter which may be subject to indemnification or advancement of Expenses covered hereunder. The failure of Indemnitee to so notify the Company shall not relieve the Company of any obligation which it may have to Indemnitee under this Agreement or otherwise.

Section 20. Notices. All notices, requests, demands and other communications under this Agreement shall be in writing and shall be deemed to have been duly given (a) if delivered by hand and receipted for by the party to whom said notice or other communication shall have

been directed, (b) when sent by confirmed electronic mail or facsimile if sent during normal business hours of the recipient, and if not so confirmed, then on the next business day, (c) if mailed by certified or registered mail with postage prepaid, on the third business day after the date on which it is so mailed, or (d) one (1) day after deposit with a nationally recognized overnight courier, specifying next day delivery, with written verification:

(a) If to Indemnitee, at the address indicated on the signature page of this Agreement, or such other address as Indemnitee shall provide in writing to the Company,

(b) If to the Company to:

Ultragenyx Pharmaceutical Inc.
60 Leveroni Court
Novato, CA 94949
Attention: Chief Financial Officer
Fax: 415.483.8810
E-Mail: SSharp@ultragenyx.com

or to any other address as may have been furnished to Indemnitee in writing by the Company.

Section 21. Contribution. To the fullest extent permissible under applicable law, if the indemnification provided for in this Agreement is unavailable to Indemnitee for any reason whatsoever, the Company, in lieu of indemnifying Indemnitee, shall contribute to the amount incurred by Indemnitee, whether for judgments, fines, penalties, excise taxes, amounts paid or to be paid in settlement and/or for Expenses, in connection with any claim relating to an indemnifiable event under this Agreement, in such proportion in order to reflect (i) the relative benefits received by the Company and Indemnitee as a result of the event(s) and/or transaction(s) giving cause to such Proceeding; and/or (ii) the relative fault of the Company (and its directors, officer, employees and agents) and Indemnitee in connection with such event(s) and/or transaction(s).

Section 22. Applicable Law and Consent to Jurisdiction. This Agreement and the legal relations among the parties shall be governed by, and construed and enforced in accordance with, the laws of the State of Delaware, without regard to its conflict of laws rules. Except with respect to any arbitration commenced by Indemnitee pursuant to Section 13(a) of this Agreement, the Company and Indemnitee hereby irrevocably and unconditionally (i) agree that any action or proceeding arising out of or in connection with this Agreement shall be brought only in the Chancery Court of the State of Delaware (the "Delaware Court"), and not in any other state or federal court in the United States of America or any court in any other country (ii) consent to submit to the exclusive jurisdiction of the Delaware Court for purposes of any action or proceeding arising out of or in connection with this Agreement, (iii) consent to service of process at the address set forth in Section 20 of this Agreement with the same legal force and validity as if served upon such party personally within the State of Delaware, (iv) waive any objection to the laying of venue of any such action or proceeding in the Delaware Court, and (v) waive, and agree not to plead or to make, any claim that any such action or proceeding brought in the Delaware Court has been brought in an improper or inconvenient forum.

Section 23. Counterparts. This Agreement may be executed in two or more counterparts, each of which shall for all purposes be deemed to be an original, but all of which together shall constitute one and the same Agreement. This Agreement may also be executed and delivered by facsimile signature and in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

Section 24. Headings. The headings of the paragraphs of this Agreement are inserted for convenience only and shall not be deemed to constitute part of this Agreement or to affect the construction thereof.

[*Remainder of this page intentionally blank*]

IN WITNESS WHEREOF, the parties have caused this Agreement to be signed as of the day and year first above written.

ULTRAGENYX PHARMACEUTICAL INC.

By: _____

Name: _____

Title: _____

INDEMNITEE

_____

Name: _____

Address:

_____

_____

_____

_____

E-mail: _____

ULTRAGENYX PHARMACEUTICAL INC.
CORPORATE BONUS PLAN

1. Purpose

This Corporate Bonus Plan (the "***Bonus Plan***") is intended to provide an incentive for superior work and to motivate eligible executives of Ultragenyx Pharmaceutical Inc. (the "***Company***") toward even higher achievement and business results, to tie their goals and interests to those of the Company and its stockholders and to enable the Company to attract and retain highly qualified executives. The Bonus Plan is for the benefit of Covered Executives (as defined below).

2. Covered Executives

From time to time, the Compensation Committee of the Board of Directors of the Company (the "***Compensation Committee***") may select certain key executives (the "***Covered Executives***") to be eligible to receive bonuses hereunder. Participation in this Plan does not change the "at will" nature of a Covered Executive's employment with the Company.

3. Administration

The Compensation Committee shall have the sole discretion and authority to administer and interpret the Bonus Plan.

4. Bonus Determinations

(a) Corporate Performance Goals. A Covered Executive may receive a bonus payment under the Bonus Plan based upon the attainment of one or more performance objectives that are established by the Compensation Committee and relate to financial and/or operational metrics with respect to the Company or any of its subsidiaries (the "***Corporate Performance Goals***"), including the following: sales; revenue; assets; expenses; earnings from operations, earnings before or after deduction for all or any portion of interest, taxes, depreciation, amortization, incentives, service fees or extraordinary or special items, whether or not on a continuing operations or an aggregate or per share basis; net income or net income per common share (basic or diluted); return on equity, investment, capital or assets; one or more operating ratios; borrowing levels, leverage ratios or credit rating; market share; capital expenditures; cash flow, free cash flow, cash flow return on investment, or net cash provided by operations; stock price, dividends or total stockholder return; development of new technologies or products; sales of particular products or services; economic value created or added; operating margin or profit margin; customer acquisition or retention; raising or refinancing of capital; successful hiring of key individuals; resolution of significant litigation; acquisitions and divestitures (in whole or in part); joint ventures and strategic alliances; spin-offs, split-ups and the like; reorganizations; recapitalizations, restructurings, financings (issuance of debt or equity) or refinancings; or strategic business criteria, consisting of one or more objectives based on the following goals: meeting specified market penetration or value added, product development or introduction (including, without limitation, any clinical trial accomplishments, regulatory or other filings or approvals, or other product development milestones), geographic business expansion, cost targets, cost reductions or savings, customer satisfaction, operating efficiency, acquisition or retention, employee satisfaction, information technology, corporate development (including, without limitation, licenses, innovation, research or establishment of third party collaborations), manufacturing or process development, legal compliance or risk reduction, patent application or issuance goals, or goals relating to acquisitions or divestitures (in whole or in part), joint ventures or strategic alliances, any of which may be (A) measured in absolute terms or compared to any incremental increase, (B) measured in terms of growth, (C) compared to another company or companies or to results of a peer group, (D) measured against the market as a whole and/or as compared to applicable market indices and/or (E) measured on a pre-tax or post-tax basis (if applicable). Further, any Corporate Performance Goals may be used to measure the performance of the Company as a whole or a business unit or other segment of the Company, or one or more product lines or specific markets. The Corporate Performance Goals may differ from Covered Executive to Covered Executive.

(b) Calculation of Corporate Performance Goals. At the beginning of each applicable performance period, the Compensation Committee will determine whether any significant element(s) will be included in or excluded from the calculation of any Corporate Performance Goal with respect to any Covered Executive. In all other respects, Corporate Performance Goals will be calculated in accordance with the Company's financial statements, generally accepted accounting principles, or under a methodology established by the Compensation Committee at the beginning of the performance period and which is consistently applied with respect to a Corporate Performance Goal in the relevant performance period.

(c) Target; Minimum; Maximum. Each Corporate Performance Goal shall have a "target" (*e.g.*, 100 percent attainment of the Corporate Performance Goal) and may also have a "minimum" hurdle and/or a "maximum" amount.

(d) Bonus Requirements; Individual Goals. Except as otherwise set forth in this Section 4(d), to the extent practicable under the circumstances: (i) any bonuses paid to Covered Executives under the Bonus Plan shall be based upon objectively determinable bonus formulas that tie such bonuses to one or more performance targets relating to the Corporate Performance Goals, (ii) bonus formulas for Covered Executives shall be adopted in each performance period by the Compensation Committee and communicated to each Covered Executive at the beginning of each performance period and (iii) no bonuses shall be paid to Covered Executives unless and until the Compensation Committee makes a determination with respect to the attainment of the performance targets relating to the Corporate Performance Goals. Notwithstanding the foregoing, the Compensation Committee may adjust bonuses payable under the Bonus Plan based on achievement of one or more individual performance objectives or pay bonuses (including, without limitation, discretionary bonuses) to Covered Executives under the Bonus Plan based on individual performance goals and/or upon such other terms and conditions as the Compensation Committee may in its discretion determine.

(e) Individual Target Bonuses. The Compensation Committee shall establish a target bonus opportunity for each Covered Executive for each performance period. For each Covered Executive, the Compensation Committee shall have the authority to apportion the target award so that a portion of the target award shall be tied to attainment of Corporate Performance Goals and a portion of the target award shall be tied to attainment of individual performance objectives.

(f) Employment Requirement. Subject to any additional terms contained in a written agreement between the Covered Executive and the Company, the payment of a bonus to a Covered Executive with respect to a performance period shall be conditioned upon the Covered Executive's employment by the Company on the bonus payment date. If a Covered Executive was not employed for an entire performance period, the Compensation Committee may pro rate the bonus based on the number of days employed during such period.

5. Timing of Payment

(a) The Corporate Performance Goals will be measured at the end of each performance period after the Company's financial reports with respect to such period(s) have been published. If the Corporate Performance Goals and/or individual goals for such period are met, payments will be made as soon as practicable following the end of such period, but not later 74 days after the end of the fiscal year in which such performance period ends.

(b) With respect to Corporate Performance Goals established and measured on an annual or multi-year basis, Corporate Performance Goals will be measured as of the end of each such performance period (*e.g.*, the end of each fiscal year) after the Company's financial reports with respect to such period(s) have been published. If the Corporate Performance Goals and/ or individual goals for any such period are met, bonus payments will be made as soon as practicable, but not later than 74 days after the end of the relevant fiscal year.

(c) For the avoidance of doubt, bonuses earned at any time in a fiscal year must be paid no later than 74 days after the last day of such fiscal year.

6. Amendment and Termination

The Company reserves the right to amend or terminate the Bonus Plan at any time in its sole discretion.

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the reference to our firm under the caption “Experts” and to the use of our report dated October 3, 2013 (except for the last paragraph of Note 2, as to which the date is January 17, 2014), in Amendment No. 2 to the Registration Statement (Form S-1 No. 333-192244) and related Prospectus of Ultragenyx Pharmaceutical Inc. (a development stage Company) for the registration of its common stock.

/s/ Ernst & Young LLP

Redwood City, California
January 17, 2014

Exhibit 99.2

CONSENT TO BE NAMED DIRECTOR

Pursuant to Rule 438 under the Securities Act of 1933, as amended, I hereby consent to being named in the Registration Statement on Form S-1 (File No. 333-192244), together with any and all amendments or supplements thereto, of Ultragenyx Pharmaceutical Inc., a Delaware corporation (the "Company"), as a person who has agreed to serve as a director of the Company upon closing of the offering and the inclusion of my biographical information in the Registration Statement. I also consent to the filing of this consent as an exhibit to the Registration Statement.

Dated: 1/14/14

/s/ Clay Siegall
Clay Siegall

Print Name: Clay Siegall