ACCELERON PHARMA INC
Form 10-K
March 02, 2015
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K
(Mark One)

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

For the Fiscal Year Ended December 31, 2014

OR

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

For the Transition Period from to
Commission File Number: 001-36065
ACCELERON PHARMA INC.
(Exact name of Registrant as specified in its charter)

Delaware	27-0072226
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
128 Sidney Street Cambridge, Massachusetts (Address of principal executive offices)	02139 (Zip Code)
(617) 649-9200 (Registrant's telephone number, including area code)	

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

Title of Class:	Name of Each Exchange on Which Registered
Common Stock, $0.001 par value	NASDAQ Global Market

Securities registered pursuant to Section 12(g) of the Act: None
Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ý No o
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Act. Yes o No ý
Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to the filing requirements for the past 90 days. Yes ý No o
Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ý No o

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405) is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. o

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

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

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

The aggregate market value of the registrant’s voting and non-voting common stock held by non-affiliates of the registrant (without admitting that any person whose shares are not included in such calculation is an affiliate) computed by reference to the price at which the common stock was last sold (based on the closing share price as quoted on the NASDAQ Global Market) as of the last business day of the registrant’s most recently completed second fiscal quarter was approximately $702 million.

As of January 31, 2015, the registrant had 32,644,321 shares of Common Stock, $0.001 par value per share, outstanding.

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DOCUMENTS INCORPORATED BY REFERENCE

The following documents (or parts thereof) are incorporated by reference into the following parts of this Form 10-K: Certain information required in Part III of this Annual Report on Form 10-K is incorporated from the Registrant's Proxy Statement for the Annual Meeting of Stockholders to be held on June 4, 2015.

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FORWARD-LOOKING STATEMENTS

This Annual Report filed on Form 10-K and the information incorporated herein by reference includes statements that are, or may be deemed, "forward-looking statements." In some cases, these forward-looking statements can be identified by the use of forward-looking terminology. The terms "anticipate", "believe", "contemplate", "continue", "could", "estimate", "expect", "forecast", "goal", "intend", "may", "plan", "potential", "predict", "project", "should", "strategy", "target", "will", "would", "vision", or, in each case, the negative or other variations thereon or other similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

The forward-looking statements in this Annual Report on Form 10-K include, among other things, statements regarding our intentions, beliefs, projections, outlook, analyses or current expectations concerning, among other things:

- our ongoing and planned preclinical studies and clinical trials;
- clinical trial data and the timing of results of our ongoing clinical trials;
- our plans to develop and commercialize dalantercept and ACE-083, and our and Celgene's plans to develop and commercialize luspatercept and sotatercept;
- the potential benefits of strategic partnership agreements and our ability to enter into selective strategic partnership arrangements;
- the timing of, and our and Celgene's ability to, obtain and maintain regulatory approvals for our therapeutic candidates;
- the rate and degree of market acceptance and clinical utility of any approved therapeutic candidate, particularly in specific patient populations;
- our ability to quickly and efficiently identify and develop therapeutic candidates;
- our commercialization, marketing and manufacturing capabilities and strategy;
- our intellectual property position; and
- our estimates regarding our results of operations, financial condition, liquidity, capital requirements, prospects, growth and strategies.

By their nature, forward-looking statements involve risks and uncertainties because they relate to events, competitive dynamics, and industry change and depend on the economic circumstances that may or may not occur in the future or may occur on longer or shorter timelines than anticipated. We caution you that forward-looking statements are not guarantees of future performance and that our actual results of operations, financial condition and liquidity, and events in the industry in which we operate may differ materially from the forward-looking statements contained herein.

Any forward-looking statements that we make in this Annual Report on Form 10-K speak only as of the date of such statement, and we undertake no obligation to update such statements to reflect events or circumstances after the date of this Annual Report on Form 10-K or to reflect the occurrence of unanticipated events.

You should also read carefully the factors described in the "Risk Factors" section of this Annual Report on Form 10-K to better understand the risks and uncertainties inherent in our business and underlying any forward-looking statements. You are advised, however, to consult any further disclosures we make on related subjects in our Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, press releases, and our website.

Trademarks

We own or have rights to trademarks, service marks and trade names that we use in connection with the operation of our business, including our corporate name, logos and website names. Other trademarks, service marks and trade names appearing in this report are the property of their respective owners. The trademarks that we own include Acceleron Pharma®. Solely for convenience, some of the trademarks, service marks and trade names referred to in this report are listed without the ® and ™ symbols, but we will assert, to the fullest extent under applicable law, our rights to our trademarks, service marks and trade names.

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PART I

Item 1. Business

Overview

We are a clinical stage biopharmaceutical company focused on the discovery, development and commercialization of novel therapeutic candidates that are based on the mechanisms that the human body uses to regulate the growth and repair of its cells and tissues. Our research focuses on key natural regulators of cellular growth and repair, particularly the Transforming Growth Factor-Beta (TGF-ß) protein superfamily. By combining our discovery and development expertise, including our proprietary knowledge of the TGF-ß superfamily, and our internal protein engineering and manufacturing capabilities, we have built a highly productive discovery and development platform that has generated innovative therapeutic candidates with novel mechanisms of action. These differentiated therapeutic candidates have the potential to significantly improve clinical outcomes for patients across many fields of medicine, and we have focused our discovery and development efforts on treatments for cancer and rare diseases.

We are leaders in discovering and developing therapeutic candidates that regulate cellular growth and repair. We focus on discovering and developing therapeutic candidates that target a group of approximately 30 secreted proteins, or ligands, that are collectively referred to as the TGF-ß superfamily. These ligands bind to subsets of 12 different receptors on the surface of cells, triggering intra-cellular changes in gene expression that guide cell growth and differentiation. The TGF-ß superfamily ligands and their receptors represent an under-explored and diverse set of drug targets.

We have four internally discovered therapeutic candidates that are currently in clinical trials. Our lead programs, luspatercept and sotatercept, are partnered with Celgene Corporation (Celgene). During 2015, we and Celgene plan to initiate a Phase 3 clinical trial with luspatercept in patients with ß-thalassemia and a Phase 3 clinical trial with luspatercept or sotatercept in patients with myelodysplastic syndromes (MDS). Luspatercept and sotatercept are designed to promote red blood cell production through a novel mechanism, and we are developing these molecules to treat anemia and associated complications in patients with ß-thalassemia and MDS. The red blood cell complications of ß-thalassemia are generally unresponsive to currently approved drugs, and MDS is a heterogeneous disease for which certain subgroups of patients have no approved drug therapy. Sotatercept is also designed to promote increases in bone mineral density. We and Celgene are developing sotatercept for the treatment of the final stage of chronic kidney disease, end-stage renal disease (ESRD), a disorder characterized by anemia and a mineral and bone disorder that leads to bone loss and heart disease. The mineral and bone disorder in these patients is not well-managed with current therapies. Our third clinical stage therapeutic candidate, dalantercept, is designed to treat cancers by inhibiting blood vessel formation through a mechanism that is distinct from, and potentially synergistic with, the dominant class of cancer drugs that inhibit blood vessel formation, the vascular endothelial growth factor, or VEGF, pathway inhibitors. We are developing dalantercept primarily for use in combination with VEGF pathway inhibitors to produce better outcomes for cancer patients. Our fourth therapeutic candidate, ACE-083, is designed to promote muscle growth and function in specific, treated muscle groups. In 2014, we initiated a Phase 1 clinical trial with ACE-083 in healthy volunteers, and we expect to initiate one or more Phase 2 clinical trials with ACE-083 in 2015.

Luspatercept has already shown promising biological activity in our clinical trials to date. Across five clinical studies initiated by us in healthy volunteers and patients with ß-thalassemia and MDS, four of which are still ongoing, luspatercept has caused a dose-dependent increase in levels of hemoglobin, the oxygen carrying protein found in red blood cells. In ß-thalassemia, all transfusion-dependent patients treated as of October 10, 2014 have experienced at least a 50% decrease in transfusion burden. We believe that this degree of effect meets or exceeds the level of efficacy that would be required in a registration study for these patients. Luspatercept also increases hemoglobin levels in ß-thalassemia patients that are non-transfusion dependent, which represent approximately 50% of ß-thalassemia patients in the United States and the European Union (EU). Additionally, preliminary clinical data indicates that luspatercept decreases iron overload in both groups of ß-thalassemia patients. Iron overload is a major cause of morbidity and mortality in these patients. In MDS patients who have failed, or are ineligible for, treatment with erythropoietin-based therapies, luspatercept increases red blood cell levels and decreases transfusion burden. Preliminary data shows an enhanced response to luspatercept among patients carrying a mutation in the splicing factor 3B, subunit 1 (SF3B1) gene. In this common subset of MDS patients, the disease is characterized by a condition

called ineffective erythropoiesis, a condition that luspatercept is mechanistically intended to address. Thus this represents an opportunity for a highly selective and personalized therapeutic approach to MDS treatment. Based on these results, we and Celgene plan to initiate Phase 3 clinical trials in both MDS and ß-thalassemia in late 2015.

Our second clinical stage therapeutic candidate, sotatercept, works by a mechanism similar to luspatercept but clinical data presented in 2014 have demonstrated that sotatercept has a distinct therapeutic profile working to stimulate bone growth as well as increase red blood cell formation and hemoglobin levels. This profile addresses an unmet medical need in patients in the later stages of chronic kidney disease (CKD), and particularly in patients with ESRD. Patients with ESRD typically have

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anemia and often have a mineral and bone disorder that leads to bone fragility and the buildup of calcified deposits in the arteries. Cardiovascular disease is the major cause of mortality in patients with ESRD. Preliminary data from an ongoing Phase 2 clinical trial in ESRD patients indicates that sotatercept, in addition to treating anemia, normalizes bone mineral density in these patients and slows the progression of vascular calcification. Celgene expects to initiate the randomized, controlled portion of a Phase 2b clinical trial in CKD patients in 2015. Additionally, sotatercept shows efficacy similar to luspatercept in MDS patients and may be selected for the Phase 3 clinical trial in those patients. Sotatercept is also being studied in a variety of disorders marked by bone fragility and anemia.

With respect to our third clinical stage therapeutic candidate, dalantercept, we are focused on the use of dalantercept in combination with an approved VEGF pathway inhibitor, particularly in patients with renal cell carcinoma (kidney cancer) or hepatocellular carcinoma (liver cancer). In the open-label portion of an ongoing Phase 2 clinical trial of dalantercept in combination with axitinib, an approved VEGF pathway inhibitor, in patients with advanced renal cell carcinoma, we have observed a response rate, by RECIST radiologic criteria, of 25%, as compared to the 11.3% response rate that has been reported in similar patients treated with axitinib alone. In 2014, we initiated the randomized, placebo-controlled part of the trial and we expect to complete enrollment of the trial in early 2016. We also initiated a Phase 1b clinical trial of dalantercept in combination with the VEGF pathway inhibitor sorafenib in patients with liver cancer in 2014.

Our fourth novel therapeutic candidate, ACE-083, is now in Phase 1 clinical testing in healthy volunteers. ACE-083 has been designed to promote muscle growth in those muscles in which the drug is injected, with minimal effects on other, non-targeted tissues. We are focused on the development of ACE-083 for diseases in which increases in the size and function of specific muscles may provide a clinical benefit, including sporadic inclusion body myositis, facioscapulohumeral dystrophy, or FSHD, and disuse atrophy. We expect to initiate one or more Phase 2 clinical trials with ACE-083 in 2015.

In January we announced our corporate objectives for the coming year. By building on the milestones achieved in 2014, we look to advance and expand our pipeline in 2015.

Our Objectives for the Year 2015

- Sotatercept and Luspatercept in Rare Blood Disorders - Celgene collaboration

Complete Phase 2 clinical trials of luspatercept and sotatercept in MDS and ß-thalassemia
Finalize Phase 3 clinical development plans with health authorities for MDS and ß-thalassemia
Initiate a Phase 3 clinical trial in MDS
Initiate a Phase 3 clinical trial in ß-thalassemia

- Sotatercept in End-Stage Renal Disease - Celgene collaboration

Initiate randomized, controlled part of Phase 2b clinical trial of sotatercept in end-stage renal disease patients

- Dalantercept in Advanced Cancers

Announce top line data from the ascending dose part of the Phase 2 trial of dalantercept with axitinib in renal cell carcinoma
Demonstrate an acceptable safety profile for the combination of dalantercept and sorafenib in hepatocellular carcinoma

- ACE-083 in Muscle Disorders

Initiate a Phase 2 trial with novel muscle agent ACE-083

- Pipeline Expansion

Conduct IND-enabling work to advance at least one new therapeutic candidate to the clinic in 2016

Our Strategy and Vision for the Year 2020

Our goal is to be a leader in the discovery, development and commercialization of novel therapeutic candidates based on the body's ability to regulate the growth and repair of its cells and tissues. In January 2015 we announced our

vision for the year 2020. Key components of our strategy are:

- Advance and expand our clinical programs to achieve regulatory approvals in five different indications. Luspatercept is expected to enter Phase 3 development in 2015, in collaboration with Celgene, and our ongoing clinical development programs with sotatercept, luspatercept, dalantercept and ACE-083 are expected to give rise to additional approvals by 2020.

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- Leverage our discovery platform to generate at least four additional novel therapeutic candidates and advance these molecules into clinical development. We intend to continue to discover and develop new therapeutic candidates that target and regulate various pathways in the TGF-ß superfamily. We plan to bring an additional therapeutic candidate into the clinic in 2016, with further candidates to follow. We expect to focus in the areas of muscle and metabolic disorders, cancer, diseases of the eye and diseases involving fibrosis.

- Build a sales and marketing organization in the United States. We have retained co-promotion rights in North America for luspatercept and sotatercept, which will be entirely funded by Celgene. We intend to build specialty sales and marketing capabilities to commercialize our other therapeutic candidates that receive regulatory approval.

- Become cash flow positive. Utilizing a combination of collaborations, and milestone and royalty payments, we intend to have revenues that meet or exceed our expenses by the year 2020.

- Strategically leverage collaborations to advance our therapeutic candidates. Our two collaborations with Celgene for sotatercept and luspatercept provide us with significant funding and access to Celgene's considerable scientific, development, regulatory and commercial capabilities. We will continue to strategically evaluate possible collaborations where doing so could enhance the development or commercialization of other therapeutic candidates in our pipeline.

We are developing luspatercept and sotatercept through our exclusive worldwide collaborations with Celgene. As of January 1, 2013, Celgene became responsible for paying 100% of worldwide development costs for both programs. We may receive up to an additional $560.0 million of potential development, regulatory and commercial milestone payments and, if these therapeutic candidates are commercialized, we will receive a royalty on net sales in the low-to-mid 20% range. We will co-promote luspatercept and sotatercept, if approved, in North America for which our commercialization costs will be entirely funded by Celgene.

We have not entered into partnerships for dalantercept or ACE-083 and we retain worldwide rights to these programs. As of December 31, 2014, our operations have been funded primarily by $105.1 million in equity investments from venture investors, $219.3 million from public investors, $64.2 million in equity investments from our collaboration partners and $216.8 million in upfront payments, milestones, and net research and development payments from our collaboration partners. We estimate that we have spent approximately $122.3 million on research and development for the three year period from 2012 through 2014.

We were incorporated in the state of Delaware in June 2003 as Phoenix Pharma, Inc., and we subsequently changed our name to Acceleron Pharma Inc. and commenced operations in February 2004. Our principal executive offices are located at 128 Sidney Street, Cambridge, Massachusetts 02139, and our telephone number is (617) 649-9200. Our Internet website is www.acceleronpharma.com. The information on, or that can be accessed through, our website is not part of this annual report, and you should not rely on any such information in making the decision whether to purchase our common stock.

The Acceleron Discovery Platform: Novel Approaches to Potent Biology

Since our founding, we have focused on developing therapeutic candidates that regulate cellular growth and repair. We have targeted a group of approximately 30 secreted proteins, or ligands, that are collectively referred to as the TGF-ß superfamily. These ligands bind to subsets of 12 different receptors on the surface of cells, triggering intra-cellular changes in gene expression that guide cell growth and differentiation. The TGF-ß superfamily ligands and their receptors represent a diverse and underexplored set of drug targets with the potential to yield potent therapeutics for the growth and repair of diseased cells and tissues. Applying our proprietary discovery and development platform, including our knowledge of the biology of the TGF-ß superfamily and its receptors, we have generated a robust pipeline of innovative clinical and preclinical therapeutic candidates targeting key mechanisms underlying cancer and rare diseases.

Our Focus—The TGF-ß Superfamily

On a daily basis, the human body must orchestrate the growth and differentiation of cells to maintain and repair its cells and organ systems. Stem cells and precursor cells are undifferentiated cell types that reside in most tissues of the

body. When tissue growth or regeneration is required, these undifferentiated cells divide and, through a series of intermediate stages, give rise to new, fully differentiated cells that build or repair the affected tissue. Decades of research have identified the TGF-ß superfamily and its associated receptors as key regulators of the growth and differentiation of stem and precursor cells.

Until recently, regulation of the erythropoietin pathway was the primary therapeutic approach to stimulate red blood cell formation. Members of the TGF-ß superfamily are now recognized as important regulators of red blood cell formation. We have shown that inhibition of members of the TGF-ß superfamily ameliorates anemia in mouse models of ß-thalassemia and

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MDS. These data, and the mechanistic rationale for our lead products luspatercept and sotatercept, were published in 2014 in a series of peer-reviewed publications in the journals Nature Medicine and Blood. Based on our findings, we are developing luspatercept and sotatercept to treat patients with these diseases.

Members of the TGF-ß superfamily also play a significant role in regulating blood vessel formation. We and our academic collaborators have shown that mice with a genetic defect in a particular receptor for members of the TGF-ß superfamily are resistant to tumor growth due to reduced blood vessel formation in the tumor. We have used this insight to design our anti-angiogenic agent, dalantercept, for the treatment of cancer.

Members of the family are also significant regulators of muscle development. A genetic defect in a TGF-ß superfamily ligand, known as myostatin, causes profound increases in skeletal muscle. A naturally occurring mutation in myostatin has been identified in animals, such as "double-muscled" breeds of cattle and in the "bully whippet" offspring of whippet racing dogs, which have been selectively bred to have increased muscle mass or function. Furthermore, a mutation in myostatin has been identified in a human family, members of which exhibit exceptional musculature and strength. Our therapeutic candidate ACE-083 is designed to build muscle mass and strength using this same mechanism found in the gene pool in many animal species. ACE-083 is presently in a Phase 1 clinical trial, and we expect to initiate one or more Phase 2 clinical trials in muscle disorders later in 2015.

Ligands of the TGF-ß superfamily cause these profound biological effects by altering gene expression in target cells. As shown in the illustration below, a ligand of the superfamily initiates intracellular signaling by binding to a receptor that is located on the surface of a target cell. Upon binding to the ligand, the receptor activates specific transcription factors inside the target cell, which are called Smad proteins. The activated Smad proteins regulate gene expression and guide cellular growth and differentiation.

The TGF-ß superfamily ligands are divided into subgroups termed the activins, the Growth and Differentiation Factors (GDFs), the Bone Morphogenetic Proteins (BMPs) and the TGF-ß subgroup (for which the superfamily is named). Our clinical stage therapeutic candidates focus on the activin, GDF and BMP subgroups.

We believe that, by employing our proprietary discovery and development platform, we can design therapeutic candidates that alter TGF-ß superfamily signaling and unlock the therapeutic potential of this group of proteins.

Acceleron Approach

By combining the powerful biology of the TGF-ß superfamily with our discovery and development expertise and our internal protein engineering and manufacturing capabilities, we have built a robust clinical and preclinical pipeline of therapeutic candidates that regulate cellular growth and repair.

We have taken a comprehensive, receptor-focused approach to access the biology of the TGF-ß superfamily. We recognized that the 12 receptors for the superfamily act as control points for the ligands and therefore represent an attractive approach for pharmacological intervention. We have in-licensed patent rights for nine of the 12 receptors and systematically evaluated interactions between each receptor and a comprehensive panel of ligands. In the body, these ligands are naturally regulated by trap proteins that bind to the ligands thereby blocking ligand-receptor interactions and diminishing signaling in the

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cell. To mimic this natural regulatory approach, we have built our therapeutic candidates using the ligand-binding part of the receptors, depicted in the upper part of the figure below, as traps that capture the relevant groups of ligands in each biological process. We link the ligand-binding portion, the extracellular domain, of these receptors to the portion of a human antibody known as the Fc domain, depicted in the lower part of the figure below, which confers favorable pharmaceutical properties. The resulting "fused" proteins can be administered by simple intravenous or subcutaneous injection and reside in the blood for sufficient periods of time to permit dosing on a weekly to monthly basis. Therapeutic candidates constructed this way are referred to as "receptor fusion proteins" or "ligand traps". Some of the most successful therapeutic candidates on the market belong to this category including Enbrel® (etanercept), Eylea® (aflibercept) and Orencia® (abatacept).

As shown in the figure below, our receptor fusion proteins act as ligand traps by binding to ligands of the TGF-ß superfamily, preventing those ligands from binding to the cell surface receptors, and thereby preventing activation of Smad proteins in the target cell.

To take full advantage of our proprietary discovery and development platform, we have developed an integrated set of technologies and capabilities to rapidly and cost-effectively create, test and advance multiple therapeutic candidates. Our protein engineering expertise allows us to create and optimize our receptor fusion proteins. We have developed the capability to generate recombinant cell lines that produce our therapeutic candidates, and assess the activity of these molecules in animals

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using our internal animal pharmacology facility or the capabilities of our academic collaborators. We have also invested in infrastructure to manufacture Phase 1 and Phase 2 clinical material quickly and flexibly using our internal current good manufacturing practices, or cGMP, compliant protein production facility to support clinical development of our therapeutic candidates.

Additionally, in 2014 we entered a multi-target antibody discovery collaboration with Adimab LLC (Adimab), a leading antibody discovery company, under which Adimab will generate human antibodies against undisclosed targets that we select. We expect that this collaboration will expand our biologics platform and provide us with enhanced access to antibody therapeutic candidates.

We use our integrated platform of research, development and manufacturing technologies to rapidly and cost-effectively create, test and advance our therapeutic candidates. Our robust clinical and preclinical pipeline is focused on areas of high-unmet medical need, particularly in the areas of cancer and rare diseases.

Our Product Pipeline

We made great strides in advancing the development of our therapeutic candidates during 2014. We and Celgene presented clinical data showing encouraging effects of luspatercept and sotatercept in patients with ß-thalassemia and MDS, and identifying a genetic marker in MDS patients that may select for those patients most likely to benefit from treatment with these candidates. Celgene presented the first data demonstrating an effect of sotatercept on both anemia and mineral and bone disorder in patients with end-stage renal disease, the final stage of chronic kidney disease. Celgene also initiated the dose ranging part of a Phase 2b trial with sotatercept in patients with end-stage renal disease. With dalantercept, in 2014 we initiated two important Phase 2 trials to evaluate the activity of dalantercept in combination with VEGF antagonists. We started the randomized, placebo controlled part of our Phase 2 trial in patients with renal cell carcinoma and we initiated a new dose finding, Phase 1b trial in patients with liver cancer. Lastly, we brought a new therapeutic candidate into clinical development by starting a Phase 1, first-in-man clinical trial with ACE-083 in healthy volunteers. ACE-083 is designed to increase muscle mass and strength in the muscles into which it is administered.

We expect to build on this progress in 2015. We expect to initiate Phase 3 clinical trials with Celgene for luspatercept in patients with ß-thalassemia and with luspatercept and/or sotatercept in patients with myelodysplastic syndromes (MDS). Celgene expects to begin the randomized, controlled part of the Phase 2b trial with sotatercept in end-stage renal disease patients. We will continue to enroll our clinical trials with dalantercept and report on data from the open label portions of these clinical trials. With our muscle program, ACE-083, we expect to complete our Phase 1 trial and initiate one or more Phase 2 clinical trials in 2015.

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Luspatercept and Sotatercept

Anemia in Patients with ß-thalassemia and MDS

Erythropoiesis, the process by which precursor cells proliferate and differentiate to give rise to red blood cells, is one of the most important and active processes in human biology. The primary role of red blood cells is to carry and deliver oxygen to other cells throughout the body. At any given time, there are approximately 25 trillion red blood cells in normal adult circulation which account for roughly 25% of the body's total number of cells. The human body produces 2.4 million new red blood cells each second. Red blood cell formation starts in the bone marrow with cells referred to as red blood cell precursors. These precursor cells go through many rounds of cellular proliferation, combined with cellular differentiation, to become more specialized cells to carry out their role as mature, functional red blood cells. We believe this highly active process of red blood cell production is normally tightly controlled by positive and negative regulators of the erythropoietic process. Erythropoietin is a positive regulator that stimulates proliferation of early red blood cell precursor cells, the BFU-E and CFU-E cells depicted in the figure below. Based on our research, it is now recognized that certain ligands in the TGF-ß superfamily are negative regulators of red blood cell precursors, starting with the Pro-E cells and those that follow, as depicted in the figure below. These members of the TGF-ß superfamily restrain the maturation of these precursors into later stage precursors and ultimately into functional red blood cells (RBCs).

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Depiction of Normal Erythropoiesis

In certain diseases, the highly active process of red blood cell production does not function properly, leading to a reduction in the number of functional red blood cells, a condition known as anemia. Anemia in some disease settings is currently treated by the use of erythropoiesis stimulating agents, such as recombinant erythropoietin, that stimulate proliferation of early stage precursors of red blood cells. However, in certain diseases, such as ß-thalassemia and MDS, anemia is caused by defects in the production of late stage red blood cell precursors, which is known as ineffective erythropoiesis.

Anemias caused by ineffective erythropoiesis are not well-treated by current therapies. As shown in the illustration below, ineffective erythropoiesis is characterized by an over-abundance of early stage red blood cell precursors and a decreased ability of late stage precursor cells to properly differentiate into healthy, functional red blood cells. The resulting anemia stimulates the body's overproduction of erythropoietin, which exacerbates the over-abundance of early stage precursors. Because the defective step in ineffective erythropoiesis lies downstream of the early stage precursors, the increase in the number of these cells fails to resolve the anemia.

Depiction of Ineffective Erythropoiesis

Based on our preclinical research, we believe that TGF-ß superfamily ligands function as negative regulators of erythropoiesis by inhibiting the maturation of these early stage red blood cell precursors. Both sotatercept and luspatercept are ligand traps designed to inhibit these negative regulators of late stage red blood cell precursors and promote their maturation into functional red blood cells. Luspatercept, is a soluble receptor fusion protein consisting of a modified extracellular domain of the activin receptor type IIB (ActRIIB) linked to the Fc domain of human IgG1, and sotatercept is a a soluble receptor fusion protein consisting of the extracellular domain of the activin receptor type IIA (ActRIIA) linked to the Fc domain of human

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IgG1. Research conducted by Acceleron, Celgene and collaborators at academic institutions has validated the mechanistic underpinnings of these therapeutic candidates, and these key findings were published in 2014 in the prestigious journals Nature Medicine and Blood.

We are developing luspatercept and sotatercept, through our collaborations with Celgene, as treatments for anemia in diseases in which erythropoiesis-stimulating agents are either not approved or are not well-suited to treat the underlying anemia. In diseases such as ß-thalassemia and MDS in which anemia is caused by ineffective erythropoiesis, we believe both sotatercept and luspatercept may help correct this defective process. At present, we and Celgene expect to advance luspatercept into a Phase 3 clinical program for patients with ß-thalassemia in 2015. We and Celgene also plan to advance either sotatercept or luspatercept into a Phase 3 clinical program for patients with MDS in 2015.

Although similar in terms of their effects on red blood cells, there are differences in how luspatercept and sotatercept bind to and inhibit ligands. Unlike luspatercept, sotatercept binds to and inhibits activin A, a TGF-ß superfamily ligand, and has been shown to increase bone mass and biomarkers of bone formation in clinical trials. Additionally, clinical data presented by Celgene in 2014 showed that sotatercept can normalize bone mineral density in patients with end-stage renal disease on hemodialysis and slow the buildup of calcified deposits in the arteries of these patients. Given its effects on bone and vascular calcification, sotatercept is being studied in patients with end-stage renal disease, where it has the potential to treat both anemia and mineral and bone disorder. In addition, in preclinical studies, sotatercept inhibits the growth of myeloma cells. Therefore, sotatercept is also being studied in multiple myeloma patients to inhibit tumor growth and improve the anemia and the bone loss associated with the disease.

ß-thalassemia

The ß-thalassemias comprise a heterogeneous group of disorders arising from defects in the genes that encode the proteins that comprise hemoglobin. Hemoglobin is a four-subunit protein complex formed of two -subunits and two ß-subunits, each with an iron-containing heme group that binds to and carries oxygen molecules within red blood cells. There are two main classifications of thalassemia, -thalassemia and ß-thalassemia, depending on whether the genetic defect lies in the gene encoding the -subunit or the ß-subunit. ß-thalassemia is particularly prevalent throughout the Mediterranean region, Middle East, and Southeast Asia, and, due to migration and immigration, is now a global disease. The Thalassaemia International Federation estimates that there are approximately 300,000 patients worldwide with ß-thalassemia, approximately 20,000 of which are in the United States and Europe, who are dependent on frequent blood transfusions. We estimate that there are at least as many ß-thalassemia patients in the same regions who are not transfusion dependent and not included in these estimates. Many of these patients have hemoglobin levels that are approximately half that of normal individuals and experience significant complications of the disease. ß-thalassemia is treated primarily by red blood cell transfusions that, over time, cause a toxic accumulation of iron in the body. A central challenge for managing patients with ß-thalassemia is to restore the red blood cell levels while avoiding iron overload.

Anemia of ß-thalassemia is primarily a result of ineffective erythropoiesis. The genetic defect leads to decreased production of the ß-subunits of hemoglobin resulting in an excess amount of the -subunits. In normal erythropoiesis, excess unpaired -subunits are eliminated by a cellular component called the proteasome. The proteasome is normally required for effective red blood cell maturation to selectively remove cellular components and organelles such as mitochondria which are replaced by hemoglobin, which constitutes 90% of the protein in a mature red blood cell. In thalassemia, the proteasome becomes saturated with the abnormally high levels of unpaired -subunits and is unable to remove other cellular components and participate in the maturation process; this causes the block in maturation. Moreover, those free -subunits that are not eliminated by the proteasome form aggregates, called hemichromes, which damage the maturing red blood cells. These hemichromes, along with the saturation of the proteasome by unpaired -subunits, contribute to the ineffective erythropoiesis of ß-thalassemia. The damaged red blood cells are filtered out by the spleen and have a reduced life span, resulting in anemia and enlargement of the spleen.

Patients with the most severe form of ß-thalassemia produce few, if any, ß-subunits, resulting in an increased amount of free -subunits. These patients typically present with life-threatening anemia within the first year of life and require regular and lifelong red blood cell transfusions, usually every 2 to 4 weeks. Because red blood cells contain significant amounts of iron, this intensive transfusion regimen contributes to a condition known as iron overload, which is the

principal cause of mortality. Consequently, therapy to reduce iron overload, called iron chelation therapy, is also part of standard treatment in these patients and typically begins after patients have received approximately 20 units of blood from transfusions during their lifetime. Iron chelation therapy alone costs between $25,000 and $40,000 per year and yet does not treat the underlying anemia. The course of the disease depends largely on whether patients are maintained on an adequate transfusion and iron chelation regimen. Poor compliance with transfusion and/or iron chelation is associated with a poor prognosis and shortened survival. However, even with the standard of care, patients are at risk of infection from transfusions as well as toxicities related to iron chelation therapy.

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Patients with an intermediate form of ß-thalassemia, who are not necessarily dependent on frequent transfusions early in life, nevertheless suffer from a wide range of debilitating conditions. The ongoing ineffective erythropoiesis leads to various complications affecting a wide range of organ systems. By the second decade of life, most of these patients' hemoglobin levels have declined to the 6-8 g/dL range, or approximately half that of normal individuals. In an attempt to correct this chronic anemia, the body produces high levels of erythropoietin resulting in a continued stimulation of the early red blood cell precursors in the bone marrow. The number of these precursors grows to such an extent in the bone marrow that it leads to skeletal deformities, porosity of the long bones, and bone fractures. Splenomegaly, or enlargement of the spleen, is the result in part of continuous clearance by the spleen of the malformed red blood cells damaged by hemichromes. This commonly leads patients to require removal of their spleen, which in turn leads to worsening of other complications, such as blood clots. Iron overload is another significant complication even in the absence of red blood cell transfusions. This is due to increased intestinal iron absorption as a result of the ongoing ineffective erythropoiesis. Patients also suffer from various endocrine disorders due, in large part, to the accumulation of iron in the endocrine glands. Importantly, iron can also accumulate in the liver and heart, leading to severe complications such as liver fibrosis and heart failure.

No drug is approved to treat the anemia of ß-thalassemia. Hematopoietic stem cell transplantation is viewed as the only curative approach for ß-thalassemia, although this option is limited by the availability of appropriate donors and by risks, including death, associated with the bone marrow transplant procedure. Consequently this treatment is used only in the most severely affected patients.

Given the effects of members of the TGF-ß superfamily ligands on late-stage erythropoiesis, we have investigated our candidate therapeutics in mouse models of this disease. We evaluated a mouse version of luspatercept, termed RAP-536, in a series of studies using a mouse model of ß-thalassemia. These mice carry deletion mutations in the ß-globin genes, resulting in a deficiency of ß-globin protein and hematologic abnormalities very similar to those seen in human ß-thalassemia patients, including severe anemia and the formation of hemichromes resulting in ineffective erythropoiesis. These mice also exhibit severe complications common in patients with thalassemia, such as an enlarged spleen, bone loss and iron overload. As reported in our 2014 publication in the journal Blood, RAP-536 treatment improved numerous hematologic parameters in these mice, including a decrease in hemoglobin aggregates, significant increases in red blood cell count, hemoglobin levels, and hematocrit, decreased serum erythropoietin, normalized red blood cell size, and reduced red blood cell breakdown, as measured by serum bilirubin. Importantly, RAP-536 decreased the elevated levels of the activated transcription factor, P-SMAD2/3, restored iron homeostasis and improved the maturation of later-stage red blood cell precursor populations, in the bone marrow and spleen, with concomitant reductions in the earlier-stage red blood cell precursor populations.

Based on the numerous beneficial effects of RAP-536 in this mouse model of ß-thalassemia, we believe that it is modifying the disease and that luspatercept has a similar potential in human patients with ß-thalassemia.

Clinical Development of Luspatercept for the Treatment of ß-thalassemia

Our objective is to develop luspatercept to increase hemoglobin levels, decrease transfusion burden, decrease iron overload and treat other disease complications in patients with ß-thalassemia. We and Celgene have selected luspatercept to enter into one or more Phase 3 clinical trials in patients with ß-thalassemia, expected to start in late 2015. The FDA and EMA have granted orphan designation for luspatercept for the treatment of ß-thalassemia.

We are currently conducting two Phase 2 clinical trials of luspatercept in patients with ß-thalassemia. The first clinical trial is designed as a two-part trial, with an ascending dose part to evaluate the safety and efficacy in patients with ß-thalassemia, and an expansion part in which additional patients are enrolled at selected dose levels. The dose levels studied in the ascending dose trial were 0.2, 0.4, 0.6, 0.8 and 1.0 mg/kg given subcutaneously once every three weeks for up to 85 days and we are currently enrolling patients at a dose level of 1.25 mg/kg. Each cohort included three to six patients receiving a single dose level during the dose escalation phase. We have selected a starting dose level of 0.8 mg/kg for each patient in the expansion part of this trial, with the opportunity for the investigator to titrate the luspatercept dose level upwards or downwards to potentially optimize the clinical benefit for the patients. The first patient in the ascending dose part of the trial was first treated in March 2013, and the first patient in the expansion part of this trial was first treated in November 2014. The primary outcome measure for this trial is the proportion of patients who have an increase in hemoglobin of ≥1.5 g/dL from baseline for ≥14 days (in the absence of red blood cell

transfusions) in non-transfusion dependent patients or a ≥20% reduction in red blood cell transfusion burden compared to the pretreatment transfusion burden in transfusion dependent patients. This trial also examines the effects of luspatercept on iron overload, an important cause of morbidity and mortality in ß-thalassemia patients. Other endpoints include healing of leg ulcers and quality of life measures. The trial is currently being conducted at up to seven sites in Italy and Greece, and we plan to include additional sites in Europe and may enroll up to 72 patients. This clinical trial is followed by a second, extension trial that permits patients from the ascending dose trial to receive luspatercept for up to one year. We have selected a dose level of 0.8 mg/kg as the starting dose level for those patients enrolling in this trial, with the opportunity for the investigator to titrate the luspatercept dose upwards or downwards to

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potentially optimize the clinical benefit to the patients. The first patient in this extension trial was first treated in November 2014.

Preliminary data from the Phase 2 ascending dose clinical trial is encouraging. We presented preliminary data, using a data cut-off date of October 10, 2014, at the 56th American Society of Hematology (ASH) Annual Meeting and Exposition in December 2014. As of the cut-off date, a total of 30 patients were treated in the dose escalation part of this study, in which luspatercept was administered subcutaneously, once every 3 weeks for up to 5 doses (16 weeks) to cohorts of 6 patients each at dose levels of 0.2, 0.4, 0.6, 0.8, or 1.0 mg/kg. Of these 30 patients, 23 were non-transfusion dependent and 7 were transfusion dependent. Nine of 12 patients (75%) treated with dose levels of 0.8 or 1.0 mg/kg of luspatercept met the study primary endpoint of an erythroid response. At lower dose levels (0.2 - 0.6 mg/kg), response rates were lower, as expected in an ascending dose trial, and the analysis presented here evaluates only the 0.8 and 1.0 mg/kg dose levels. Specifically, 6 of 6 (100%) transfusion dependent patients at the 0.8 or 1.0 mg/kg dose level achieved a reduction in transfusion burden of at least 60% over a 12 week period, and 3 of 6 (50%) non-transfusion dependent patients had a sustained hemoglobin increase of at least 1.5 g/dL for ≥ 2 weeks. Reductions in liver iron concentration (LIC), a measure of iron overload, were observed in both non-transfusion dependent and transfusion-dependent patients. In non-transfusion dependent patients with baseline LIC ≥5 mg/g dry weight, 8 of 12 (67%) patients had a reduction in LIC of ≥1 mg/g dry weight in this 16 week study. In transfusion dependent patients with baseline LIC ≥5 mg/g dry weight, 4 of 5 (80%) patients had reductions in LIC ranging from 0.7 to 4.7 mg/g dry weight. Transfusion dependent patients also had reductions in serum ferritin, another marker of iron overload, with maximum reductions ranging from 12-60%. We also observed improvements in certain complications of the disease. A subset of patients with ß-thalassemia develops leg ulcers. We have observed that 3 of 3 patients who presented with persistent leg ulcers experienced rapid healing of the ulcers following treatment with luspatercept.

The most common adverse events were bone pain, headache, myalgia, asthenia, influenza, macule and pain in extremity. There were no drug-related serious adverse events and no patient developed anti-drug antibodies on treatment. 3 patients discontinued early due to adverse events; 1 patient (0.6 mg/kg) with occipital headache, 1 patient (0.8 mg/kg) with ankle pain, and 1 patient (0.8 mg/kg) with back pain.

We and Celgene intend to announce additional data from these trials in June, 2015 at the Annual Congress of the European Hematology Association (EHA) and in December, 2015 at the ASH Annual Meeting.

Based on these data, we and Celgene have selected luspatercept as the appropriate therapeutic candidate to advance into Phase 3 studies in patients with ß-thalassemia. We expect that a Phase 3 endpoint in transfusion-dependent patients would be a decrease of approximately 25%-40% in transfusion burden over a sustained time period. In non-transfusion-dependent patients we expect a Phase 3 trial of luspatercept to use a primary endpoint of hemoglobin increase over a sustained time period, with key secondary endpoints to include decreases in iron overload or other complications of the disease. In each sub-population of patients with ß-thalassemia, the trial would be randomized and placebo-controlled with an approximate 6-12 month period of dosing with luspatercept. We and Celgene have initiated interactions with the FDA and regulatory agencies in European countries regarding registration trial design in both transfusion-dependent and non-transfusion-dependent patient populations.

Based on currently projected timelines, which are subject to change, in 2015 we plan to complete the final dose-titration expansion cohort, hold end of Phase 2 meetings with regulatory agencies and we expect to initiate a Phase 3 clinical trial in patients with ß-thalassemia in late 2015.

Myelodysplastic Syndromes

Myelodysplastic syndromes, or MDS, are a group of heterogeneous hematologic diseases characterized by abnormal proliferation and differentiation of blood precursor cells, including red blood cell precursors, in the bone marrow. This leads to peripheral reductions in red blood cells, often accompanied by decreases in white blood cells and platelets, as well as a risk of disease progression to acute myeloid leukemia. Although MDS patients may have varying forms of the disease, anemia is present in the vast majority of MDS patients at the time of diagnosis. MDS is primarily a disease of the elderly, with 88% of cases diagnosed in individuals 60 years of age or older. Cancer surveillance databases estimate the annual incidence of MDS in the United States at 10,000 to 15,000 cases and the overall U.S./EU prevalence at approximately 125,000 patients.

Hematopoietic stem cell transplantation represents the only treatment modality with curative potential, although the relatively high morbidity and mortality of this approach limits its use. Approximately 70% of the MDS patients in the U.S. and EU are classified as lower risk and 30% are classified as higher risk. High risk patients are typically treated with inhibitors of DNA methyltransferase such as Vidaza® or Dacogen®, or generic versions that are now available in some countries. The patients categorized as low risk typically receive erythropoiesis stimulating agents as first-line therapy, though erythropoiesis stimulating agents are not approved by the FDA or the EMA for the treatment of anemia in MDS patients. Our internal market research estimates that erythropoiesis stimulating agents generate $500 to $700 million in annual U.S. sales from their use in this disease. After failure on erythropoiesis stimulating agents, patients are treated with red blood cell transfusion and/or

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Revlimid®, Vidaza® or Dacogen®. Across the disease, approximately 15% of patients have a specific chromosomal mutation and are treated with Revlimid® (2014 U.S. sales of $333 million for MDS).

The anemia in MDS is primarily due to ineffective erythropoiesis, and a significant number of MDS patients have serum erythropoietin levels substantially above the normal range, indicating that the anemia in these MDS patients is not a consequence of erythropoietin deficiency. The ineffective erythropoiesis of MDS may be caused by excess signaling by members of the TGF-ß superfamily, which signaling inhibits red blood cell maturation. For this reason we believe that blocking this excess signaling by sotatercept or luspatercept may reverse this inhibition.

Approximately 50% of MDS patients are unresponsive to the administration of recombinant erythropoietin and instead require red blood cell transfusions, which can increase the risk of infection and iron-overload related toxicities. Treatment-resistant anemia resulting from ineffective erythropoiesis is a major cause of morbidity in MDS patients.

Given the effects of members of the TGF-ß superfamily ligands on late-stage erythropoiesis, we have investigated our candidate therapeutics in mouse models of MDS, with a focus on luspatercept. In our 2014 publication in the journal Nature Medicine, we and our collaborators showed that the ligand GDF11 is expressed at an elevated level in a mouse model of MDS, leading to elevated levels of an activated transcription factor, P-SMAD2/3, and ineffective erythropoiesis. RAP-536 treatment reduced P-SMAD2/3 levels and caused statistically significant increases in red blood cell count, hemoglobin levels and hematocrit compared to controls. Additionally, RAP-536 reduced the ineffective erythropoiesis as evidenced by the improvement in the ratio of red blood cell precursors to other cells in the bone marrow. In a similar manner, sotatercept binds to GDF11 and reduces P-SMAD2/3 levels.

Based on these data, we believe that luspatercept and sotatercept have the potential to target important mediators of disease in human patients with MDS.

Clinical Development of Luspatercept and Sotatercept in MDS

Our objective is to develop luspatercept or sotatercept to increase hemoglobin levels and decrease transfusion burden in patients with MDS, with patients ultimately becoming transfusion independent. Additionally, we intend to develop a personalized medicine approach to the disease by identifying biomarkers that align with the mechanism of action of our therapeutic candidates to aid in the selection of patients that will most benefit from treatment with our therapeutic candidates.

We and Celgene are currently conducting Phase 2 clinical trials with both luspatercept and sotatercept in patients with MDS. We and Celgene expect to initiate one or more Phase 3 clinical trials in patients with MDS in late 2015, using either luspatercept or sotatercept. The FDA has granted orphan designation for luspatercept and sotatercept for the treatment of MDS, and the EMA has granted orphan designation for luspatercept for the treatment of MDS.

We are conducting two Phase 2 clinical trials of luspatercept in patients with MDS. The first clinical trial is designed as a two-part trial, with an ascending dose part to evaluate the safety and efficacy in patients with low- or intermediate-1 risk MDS, and an expansion part in which additional patients are enrolled at selected dose levels. The dose levels studied were 0.125, 0.25, 0.5, 0.75, 1.0, 1.33 and 1.75 mg/kg given subcutaneously once every three weeks for up to 85 days. Each cohort included three to six patients receiving a single dose level during the dose escalation part of the trial. We have selected a starting dose level of 1.0 mg/kg for patients enrolling in the expansion part of this trial, with the opportunity for the investigator to titrate the luspatercept dose upwards or downwards to potentially optimize the clinical benefit for the patients. The first patient in the ascending dose part of this trial was first treated in January 2013, and the first patient in the expansion part of this trial was first treated in October, 2014. We have currently completed enrollment in all of the dose escalation cohorts and we have completed enrollment of patients in the expansion part of the trial, with 31 patients enrolled in this part, and a total of 58 patients enrolled in the trial as a whole. Patients enrolled in the dose escalation trial are eligible to enroll in a second Phase 2 trial that permits dosing with luspatercept for up to one year. The primary outcome measure is the proportion of patients who have an increase of hemoglobin ≥1.5 g/dL from baseline for 14 days in the absence of red blood cell transfusions in low transfusion burden (LTB) patients or a ≥50% or ≥4 unit reduction of red blood cell transfusions over a period of eight weeks compared to pretreatment transfusion burden in high transfusion burden (HTB) patients. These trials are being conducted at up to nine sites in Germany.

Preliminary data from the Phase 2 ascending dose clinical trial is encouraging. We presented preliminary data, using a data cut-off date of October 3, 2014, at the 56th American Society of Hematology (ASH) Annual Meeting and

Exposition in December 2014. As of the cut-off date, a total of 26 patients were treated in the dose-finding part of the study in which luspatercept was administered subcutaneously once every 3 weeks for up to 5 doses (16 weeks) at dose levels of 0.125 (n=3), 0.25 (n=3), 0.5 (n=3), 0.75 (n=6), 1.0 (n=3) 1.33 (n=6), or 1.75 (n=2) mg/kg. Of these 26 patients, 19 had a high transfusion burden (≥4 units RBC/8 weeks) and 7 had a low transfusion burden (< 4 units RBC/8 weeks). 54% of patients had been treated previously with erythropoiesis stimulating agents (ESA) and 19% of patients had previously been treated with lenalidomide. At lower dose levels (0.125 - 0.5 mg/kg), response rates were lower, as expected in an ascending dose trial, and the analysis presented here evaluates only the 0.75 - 1.75 mg/kg dose levels. With regard to LTB patients, 4 of 5 (80%) LTB patients

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treated with dose levels of 0.75 - 1.75 mg/kg of luspatercept achieved the primary endpoint of hemoglobin increase ≥1.5 g/dL for ≥2 weeks in this 16 week study. Additionally, 2 of 5 (40%) of LTB patients achieved the International Working Group (IWG) Hematologic Improvement Erythroid (HI-E) response criteria of a hemoglobin increase ≥1.5 g/dL for ≥8 weeks. The mean maximum change for patients treated with luspatercept at dose levels of 0.75 and 1.75 mg/kg was 2.2 and 3.5 g/dL, respectively. All 5 LTB patients treated with luspatercept at dose levels of 0.75-1.75 mg/kg had received prior ESA. With regard to HTB patients, 5 of 12 (42%) HTB patients treated with luspatercept dose levels of 0.75-1.75 mg/kg of achieved IWG HI-E criteria of a reduction of ≥4 units RBC over 8 weeks, and 3 of 12 (25%) HTB patients treated with luspatercept dose levels of 0.75-1.75 mg/kg achieved transfusion independence for ≥8 weeks. We noted that patients with a cell morphology referred to as ring sideroblasts, coupled with a mutation in the gene SF3B1 (splicing factor 3B, subunit 1) showed a greater response rate. While the erythroid response (HI-E, IWG) was achieved in 41% of all patients treated at dose levels of ≥0.75 mg/kg, the erythroid response (HI-E, IWG) was achieved in 67% of patients with ring sideroblasts and SF3B1 mutations. SF3B1 mutations are seen commonly in MDS patients with ring sideroblasts and are associated with ineffective erythropoiesis, suggesting a mechanistic link between luspatercept's mechanism of action and this patient group. The presentation of this data was selected by the American Society of Hematology as "Best of ASH" at this meeting.

The most common adverse events in this clinical trial were diarrhea, muscle spasms, bone pain, fatigue, myalgia and nasopharyngitis. There were no drug-related serious adverse events. There was one possibly related grade 3 adverse event of blast cell count increase.

Celgene is conducting a Phase 2 clinical trial of sotatercept for the treatment of anemia in patients with low or intermediate-1 risk MDS. The dose levels studied are 0.1, 0.3, 0.5, 1.0 and 2.0 mg/kg given subcutaneously once every three weeks for five cycles, and up to three additional cycles for late responders, with continued treatment at the discretion of the investigator. Each cohort may include up to 20 patients receiving a single dose level during the dose escalation phase, followed by an expansion phase at a selected dose level in up to 15 additional patients. The first patient in the trial was first dosed in December 2012. To date, 57 patients have enrolled in the trial and Celgene is currently enrolling patients at the 2.0 mg/kg dose level. The primary outcome measure is erythroid hematological improvement (HI-E). For patients who require transfusions of <4 units of red blood cells in the eight weeks prior to dosing, HI-E is an increase in hemoglobin of ≥1.5 g/dL sustained over a period ≥8 weeks in the absence of red blood cell transfusions. For subjects that require transfusions of ≥4 units of red blood cells in the eight weeks prior to dosing, HI-E is a decrease of ≥4 units of red blood cells transfused over a period of eight weeks compared to the number of units transfused in the eight weeks prior to treatment. This trial also evaluates the effects of sotatercept on iron overload and bone metabolism. The trial is being conducted at up to 23 sites in the United States and France.

Preliminary data from the Phase 2 ascending dose clinical trial is encouraging. Celgene presented preliminary data, using a data cut-off date of May 22, 2014 at the 56th American Society of Hematology (ASH) Annual Meeting and Exposition in December 2014. As of the cut-off date, a total of 54 patients were enrolled in this dose-finding study in which sotatercept was administered subcutaneously once every 3 weeks at dose levels of 0.1 (n=7), 0.3 (n=6), 0.5 (n=21), and 1.0 (n=20) mg/kg. Of these 54 patients, 46 (85%) had a high transfusion burden (≥4 units RBC/8 weeks) and 8 (15%) had a low transfusion burden (< 4 units RBC/8 weeks). 96% of patients had received prior ESA, 57% had a prior hypomethylating agent, and 48% had prior lenalidomide. With regard to LTB patients, 5 (63%) patients achieved a mean hemoglobin increase ≥1.5 g/dL and transfusion independence sustained for ≥ 8 weeks. The duration of transfusion independence ranged from 76 to 233+ days. Maximum mean hemoglobin increases ranged from 1.9 to 4.4 g/dL. With regard to HTB patients, 19 of 45 HTB patients (42%) achieved IWG HI-E criteria of a reduction ≥4 RBC units/8 weeks. 5 HTB patients (11%) achieved transfusion independence. The duration of transfusion independence ranged from 59 to 345+ days.

The most common treatment emergent adverse events in this clinical trial that were considered suspected as related to sotatercept were fatigue/asthenia, headache, decreased appetite, nausea and dyspnea. 3 of 54 (6%) patients discontinued due to treatment emergent adverse events considered related to sotatercept. 1 patient with grade 2 hemolytic anemia; 1 patient with grade 3 hypertension; and 1 patient with grade 2 muscle weakness in the 0.3, 0.5, and 1.0 mg/kg dose groups, respectively.

Acceleron and Celgene intend to announce additional data from these clinical trials in April 2015, at the MDS International Symposium, in June, 2015 at the Annual Congress of the European Hematology Association (EHA) and in December, 2015 at the ASH Annual Meeting.

Based on these data, we and Celgene are planning Phase 3 clinical trials for either luspatercept or sotatercept in patients with MDS. We expect our registration program to focus on either first line treatment of ESA-naive patients or second line treatment of ESA-experienced patients, or both. In either case, we expect the primary endpoint to be a decrease in the incidence of red blood cell transfusions, with randomization versus ESA therapy (for first line patients) or best supportive care (for second line patients).

Based on currently projected timelines, which are subject to change, we expect to initiate a Phase 3 clinical trial in patients with MDS in late 2015.

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Chronic Kidney Disease

Chronic kidney disease is a disorder marked by the progressive loss of kidney function, ending with the dialysis-dependent state known as end-stage renal disease (ESRD). There are approximately 700,000 ESRD patients on hemodialysis in the U.S. and EU combined. ESRD patients typically have several complications from the disease, including anemia, mineral abnormalities, bone loss and vascular calcification. Anemia in chronic kidney disease is typically treated with erythropoietin-based agents, termed erythropoiesis stimulating agents, that have been approved for this indication for over twenty years. Because erythropoietin is produced primarily in the kidney and to a lesser extent in the liver, patients with chronic kidney disease produce sub-optimal amounts of erythropoietin, which leads to anemia. Additional serious complications of chronic kidney disease include a condition known as chronic kidney disease - mineral and bone disorder (CKD-MBD) that occurs when the diseased kidneys fail to maintain proper levels of calcium and phosphorous in the blood, leading to abnormal bone hormone levels, weakened bones and vascular calcification. The progressive buildup of calcified deposits in the arteries of CKD patients is thought to contribute to the markedly high risk of cardiovascular disease in this patient population. While phosphate binding agents and calcimimetic agents are used to manage mineral abnormalities in CKD patients, there are no effective therapies for the treatment of the bone loss and vascular calcification.

Sotatercept has the potential to differentiate itself from erythropoiesis stimulating agents in this patient population because of its positive effects on bone metabolism observed following the administration of sotatercept in preclinical models, healthy volunteers and cancer patients. Additionally, in mouse models of vascular calcification, sotatercept caused a reduction of calcified deposits in the aorta. At the November 2014 Meeting of the American Society of Nephrology, Celgene presented preliminary data from the ongoing Phase 2 study of sotatercept in ESRD patients, showing that sotatercept addresses anemia in these patients while also normalizing bone mineral density and slowing the progression of vascular calcification.

Based on these data, we believe that sotatercept has the potential to address significant unmet medical needs in patients with ESRD.

Clinical Development of Sotatercept in Chronic Kidney Disease.

The objective of our collaboration with Celgene in this therapeutic area is to develop sotatercept to increase bone mineral density and reduce vascular calcification in ESRD patients, while also increasing hemoglobin levels and decreasing transfusion burden.

Celgene is conducting two Phase 2 clinical trials with sotatercept in patients with end-stage renal disease on hemodialysis. The first is a Phase 2 clinical trial designed as a randomized, placebo-controlled dose escalation study to evaluate the pharmacokinetics, safety, efficacy, tolerability and pharmacodynamics of sotatercept for the correction of anemia in patients with chronic kidney disease on hemodialysis. The first patient in the trial was first dosed in August 2010. Dose levels of 0.1, 0.3, 0.5 and 0.7 mg/kg administered subcutaneously once every four weeks for up to eight cycles were evaluated. The primary endpoints are pharmacokinetics and safety. Other endpoints include effects on hemoglobin and serum markers of bone metabolism. The trial is being conducted at up to 21 sites in the United States and may enroll up to 56 patients. We expect that Celgene will complete this study in 2015.

Early data from this trial are encouraging. An interim analysis from this clinical trial was presented at the meeting of the American Society of Nephrology in November 2014, demonstrating positive effects on bone loss, vascular calcification and anemia in end-stage renal disease patients on hemodialysis. Sotatercept slowed progression of vascular calcification in the abdominal aorta. The dose dependent change from baseline in total Agatston score (a measure for vascular calcification) over approximately 8 months was 58.4%, 24.9%, 17.3% and 3.4% in the placebo, 0.3, 0.5 and 0.7 mg/kg cohorts, respectively. Sotatercept treatment led to dose dependent decreases in trabecular and increases in cortical bone mineral density over approximately 8 months. Changes in the lumbar spine bone (trabecular bone) mineral density were 12.6%, 8.0%, 0.5% and -2.7% in the placebo, 0.3, 0.5 and 0.7 mg/kg cohorts, respectively. Changes in the femoral neck cortical bone mineral density were -0.9%, -1.4%, 1.6% and 3.0% in the placebo, 0.3, 0.5 and 0.7 mg/kg cohorts, respectively. Changes in the total hip cortical bone mineral density were -0.1%, -1.1%, 0.5% and 2.7% in the placebo, 0.3, 0.5 and 0.7 mg/kg cohorts, respectively. Sotatercept also produced dose dependent increases in hemoglobin in these patients on hemodialysis during the first 28-day dose cycle. A hemoglobin increase of ≥1.0 g/dL was achieved by 13%, 38%, 43% and 60% of the patients in the placebo, 0.3, 0.5 and 0.7 mg/kg cohorts,

respectively. Treatment with EPO for hemoglobin levels below 9 g/dL was given to 63%, 25%, 29% and 0% of the patients in the placebo, 0.3, 0.5 and 0.7 mg/kg cohorts, respectively.

Sotatercept was generally well-tolerated and most treatment emergent adverse events were mild or moderate in severity, unrelated to study drug, relatively similar between groups, and generally consistent with subjects' medical histories. The most common treatment emergent adverse events were fatigue, pain, constipation, nausea, viral infection, hypertension, fall, dizziness and increased blood phosphorus.

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Based in part on these interim data, and previously observed effects of sotatercept on bone biomarkers, Celgene initiated a second Phase 2 clinical trial in Europe with sotatercept in patients with end-stage renal disease who are on hemodialysis. The first patient in this trial was first dosed in December 2013. The study is designed as a two-part study to assess the safety and efficacy of sotatercept as a therapy to treat anemia and to control the adverse manifestations of chronic kidney disease-mineral and bone disorder (CKD-MBD). Patients in both parts of the study must first be on a stable dose of an erythropoiesis stimulating agent (ESA) to maintain hemoglobin levels and, after an ESA treatment free period of approximately five days, will then be switched to treatment with sotatercept.

The first part is a dose-escalation study of intravenous and subcutaneous routes of administration of sotatercept in approximately 60 patients to evaluate pharmacokinetics, safety and tolerability. Patients in the dose escalation part of the study will be given sotatercept once every two weeks up to a total of eight doses and followed for approximately four months after their last dose. The first part of the study is designed to inform the dosing regimens to be tested in the second part of the clinical trial. The second part will be a randomized, controlled study of approximately 230 patients to evaluate the efficacy and safety of sotatercept versus an erythropoiesis stimulating agent. Efficacy measures for part 2 of the study include the change in mean hemoglobin concentration from baseline and the ability of sotatercept to maintain patients' hemoglobin levels within a target range after switching from an ESA to sotatercept. Measures of biomarkers for bone formation and bone resorption and for mineral metabolism also will be studied, along with imaging of vascular calcification. In 2015, we expect that Celgene will complete the dose finding part of this trial and initiate the randomized, controlled part of the trial.

Acceleron and Celgene intend to announce additional data from these sotatercept trials in May 2015, at the ERA-EDTA Congress, and in November, 2015 at the ASN Annual Meeting.

Additional Indications

Through pre-clinical experiments and a program of investigator-initiated clinical trials, we and Celgene continue to explore additional indications for luspatercept and sotatercept.

Multiple Myeloma. Multiple myeloma is a cancer of the bone marrow that leads to the uncontrolled growth of certain white blood cells, causing bone marrow failure, bone pain, bone fractures and kidney problems. Nearly all multiple myeloma patients suffer from anemia. Investigators at the Massachusetts General Hospital are conducting a trial to explore the possibility that the combination of anti-myeloma therapies Revlimid® and dexamethasone together with sotatercept may reduce the growth of cancer cells along with improving anemia as well as bone lesions that often occur in patients with multiple myeloma. In 2014, investigators at the University of Indiana initiated a Phase 2a clinical trial to evaluate the effects of sotatercept on bone mass and turnover in patients with multiple myeloma.

Diamond-Blackfan Anemia. Diamond-Blackfan anemia is a rare and severe anemia that is present at birth in affected individuals. Investigators at North Shore Long Island Jewish Health System are conducting a trial to determine the safety and efficacy of sotatercept in adults with Diamond-Blackfan anemia who are red blood cell transfusion-dependent.

Myelofibrosis. Myelofibrosis is an acquired disease of the bone marrow that results in replacement of the bone marrow with fibrotic tissue leading to bone marrow failure and inability to make new blood cells, including red blood cells, which leads to anemia. Investigators at the MD Anderson Cancer Center are conducting a trial to determine the safety and efficacy of sotatercept in patients with myeloproliferative neoplasm-associated myelofibrosis and anemia.

Sickle Cell Disease. We have reported positive effects of RAP-536 in mouse models of sickle cell disease. Of particular note, RAP-536 treatment causes an approximately 60% decrease in the number of irreversibly sickled cells observed in the blood smears of treated mice and can be combined with hydroxyurea, an approved therapy in this indication. Further, treatment of sickle cell mice with RAP-536 alone or in combination with hydroxyurea reduced vascular congestion and end organ damage associated with the disease in these mice. We and Celgene are evaluating approaches to study this activity in patients.

Taken together, our clinical and preclinical results suggest that luspatercept and sotatercept may be meaningful novel therapies for the treatment of anemia and other complications of disease across a wide range of indications that are not well-served by currently approved therapeutic agents.

Additional Information Regarding Luspatercept

Luspatercept was previously studied in a double-blind, placebo-controlled, randomized, ascending dose Phase 1 clinical trial in 32 healthy volunteers that has been completed. Luspatercept produced dose-dependent increases in hemoglobin and red blood cells. The proportion of subjects with a hemoglobin increase of ≥1.0 g/dL increased on a dose-dependent basis, with approximately 80% of subjects in the 0.25 mg/kg dose level achieving this threshold.

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In the completed Phase 1 clinical trial in healthy volunteers, luspatercept was well-tolerated. No luspatercept related serious adverse events were reported in the completed Phase 1 clinical trial. Commonly observed possibly or probably treatment-related adverse events included injection site bruising, injection site blemish, dry skin, numbness, muscle spasms, muscle pain, generalized itchiness and raised rash.

Luspatercept is eligible for study in the United States under an IND that we submitted to the FDA on June 14, 2011. The indication identified in the IND is for the treatment of anemia in patients with MDS. No studies are being conducted under this IND at this time. In addition, luspatercept is being studied in Europe under two separate Clinical Trial Applications (CTAs). The first is for a Phase 2 study for the treatment of anemia in adult patients with ß-thalassemia, submitted to Italy on August 29, 2012, to Turkey on June 14, 2013, and to Greece on July 2, 2013. The second is for a Phase 2 study for the treatment of anemia in patients with low- or intermediate-1 risk MDS, submitted to Germany on August 21, 2012.

Additional Information Regarding Sotatercept

Six human clinical trials of sotatercept, including Phase 1 clinical trials in healthy volunteers and Phase 2 clinical trials of patients with multiple myeloma, breast cancer, and non-small cell lung cancer, collectively involving over 160 patients have been conducted to date. In healthy volunteers, we observed increases in red blood cells and hemoglobin. The mean change in hemoglobin for the patients who received a single dose of 1.0 mg/kg was almost 3 g/dL, which is similar to receiving a transfusion of three units of blood. We have also shown that in a randomized, placebo-controlled trial in patients with multiple myeloma receiving melphalan, prednisolone and thalidomide, sotatercept produced dose-dependent increases in hemoglobin. In the placebo and 0.1 mg/kg sotatercept cohorts, none of the patients achieved at least a 1.5 g/dL increase in hemoglobin at day 29 of the trial compared to their baseline levels. In the 0.3 and 0.5 mg/kg sotatercept cohorts, 13% and 38% of the patients, respectively, achieved at least a 1.5 g/dL increase in hemoglobin at day 29 of the trial compared to their baseline levels. In a randomized, placebo-controlled clinical trial in breast cancer patients who had anemia due to myelosuppressive chemotherapy, sotatercept produced dose-dependent increases in hemoglobin levels. In both the placebo and 0.1 mg/kg sotatercept cohorts, 20% of the patients had their hemoglobin levels increase to at least 11 g/dL maintained for 28 days in the absence of a red blood cell transfusion or use of an erythropoiesis stimulating agent. In the 0.3 mg/kg cohort, 22% of the patients achieved this outcome and in the 0.5 mg/kg cohort, 75% of the patients achieved this threshold. In a randomized, dose-ranging Phase 2 trial of sotatercept in patients with metastatic non-small cell lung cancer, sotatercept, administered at a fixed dose of 15 or 30 mg given subcutaneously every six weeks, produced increases in hemoglobin. In patients who did not receive red blood cell transfusions within the first four weeks, the change from baseline was at least 1 g/dL of hemoglobin for 40% of patients at week 2 and 16% of patients at week four. Given the results of these trials, we and Celgene may decide to pursue further clinical development in the future in one or more of these indications.

Across the completed clinical trials, sotatercept has been generally well-tolerated. In studies with healthy volunteers, the only treatment-related serious adverse event was a report of persistent, progressive high blood pressure in one subject. While the precise cause of elevated blood pressure cannot be determined, it was an expected consequence of elevated red blood cell levels that occurred in this subject. Commonly observed adverse events included headache, infection, dizziness, hypertension, hot flush, tingling, muscle spasms, limb injury, fatigue and asthenia. In three studies of patients with cancer (myeloma, breast and lung cancer), one sudden death was reported in a myeloma patient. The event was evaluated as probably related to the concurrent anti-myeloma therapy of melphalan, prednisolone and thalidomide and possibly related to sotatercept. One patient with advanced breast cancer experienced serious adverse events of perforated gastric ulcer and peptic ulcer disease that were evaluated as possibly related to sotatercept. One patient with advanced lung cancer experienced a serious adverse event of a cerebrovascular accident (blockage of a blood vessel in the brain) that was suspected as related to treatment.

Sotatercept is the subject of three separate company-sponsored U.S. IND applications. We submitted the first IND to the FDA on March 13, 2006 for the treatment of postmenopausal osteoporosis. There are currently no studies being conducted under this IND. We submitted the second IND to the FDA on March 27, 2009 to assess the use of sotatercept for the treatment of anemia in various cancer-related indications. We transferred sponsorship of both INDs to Celgene on January 19, 2010. Under the second IND, sotatercept is currently being studied in patients with

lower-risk MDS. A third IND was submitted by Celgene to the FDA on January 25, 2010 to assess sotatercept for the treatment of anemia in patients with end-stage renal disease. In addition, sotatercept is being studied in Europe under three separate Clinical Trial Applications (CTAs). The first CTA is for a Phase 2 study for the treatment of anemia in adult patients with ß-thalassemia, submitted to France on December 28, 2011, to the United Kingdom on July 26, 2012, to Italy on July 27, 2012, and to Greece on November 23, 2012. The second CTA is for a Phase 2 study for the treatment of anemia in patients with lower-risk MDS, submitted to France on October 10, 2012. The third CTA is for a Phase 2 study for the treatment of anemia in patients with chronic kidney disease, with Belgium, Germany, Portugal, Spain, and the UK joining under the Voluntary Harmonization Procedure on June 17, 2013. Sotatercept is also being studied in the United States under investigator-sponsored INDs.

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Dalantercept

Inhibiting Angiogenesis to Limit Tumor Growth

Angiogenesis is a process by which new blood vessels are formed. Angiogenesis can be simplified to two major stages—the proliferative stage followed by the maturation stage. During the proliferative stage, vascular endothelial cells, the cells lining the inside of the blood vessels, multiply in number and migrate to the site where a new vessel will be formed. This proliferative stage is followed by the maturation stage during which the endothelial cells coalesce to form tubes which are then stabilized through the recruitment of perivascular cells that form an outer layer of the blood vessels resulting in fully formed, functional vessels.

Tumors depend on angiogenesis to form new blood vessels to supply nutrients and oxygen to feed the rapidly growing malignant cells. The principal molecule driving the proliferative stage of angiogenesis in tumors is a protein called vascular endothelial growth factor (VEGF). Inhibiting VEGF-driven angiogenesis to control tumor growth has become an important and widely-used approach to cancer treatment. There are several FDA-approved cancer drugs that inhibit the VEGF pathway, with over $10 billion in aggregate worldwide sales. Despite the success of these drugs, many patients fail to respond or develop resistance to VEGF pathway inhibitor therapy, resulting in an unmet need for new therapies to inhibit angiogenesis by a different mechanism.

We are using our knowledge of the TGF-ß superfamily to develop dalantercept, a novel therapeutic candidate targeting the maturation stage of angiogenesis. Recently, the activin receptor-like kinase 1 (ALK1) has been recognized as a key regulator of the maturation stage of angiogenesis. ALK1 is one of the 12 receptors for ligands in the TGF-ß superfamily and is found primarily on endothelial cells. The importance of the ALK1 pathway in angiogenesis was discovered, in part, through research into the genetic basis of the disease hereditary hemorrhagic telangiectasia 2 (HHT-2) in which patients manifest vascular defects including reduced ability to form capillary beds, which are the networks of small blood vessels that connect arteries to veins and are necessary for nutrient and waste exchange in tissues. This research revealed that these patients have only one of two functional copies of the ALK1 gene.

We reasoned that leveraging the biology of the ALK1 pathway to inhibit maturation of blood vessels could impair the growth of tumors by limiting the development of capillary beds within the tumor. To test this hypothesis, mice with a predisposition to develop tumors were bred to have only one, rather than two copies, of the ALK1 gene. In response to the loss of half of the ALK1 genes, tumor growth and size and blood vessel density in the tumor were reduced by half. Patients with HHT have better outcomes than non-HHT individuals with regard to certain tumor types, suggesting that targeting the ALK1 signaling pathway may be an effective approach to treat cancer. These results and additional research in the field have established the ALK1 signaling pathway as a promising target for developing a new class of anti-angiogenesis agents—ALK1 pathway inhibitors.

We believe one promising opportunity for dalantercept will be its use in combination with VEGF pathway inhibitors because these agents target distinct sequential steps in angiogenesis. Moreover, we and others have hypothesized that agents, such as dalantercept, that inhibit vessel maturation are able to sensitize the tumor vasculature to the anticancer effects of VEGF pathway inhibition. We believe that newly formed blood vessels become more resistant to VEGF pathway inhibitors as they mature. Therefore we believe that by preventing blood vessel maturation, dalantercept may maintain newly formed vessels in an immature state that increases their susceptibility to VEGF pathway inhibitors. We and our academic collaborators have also shown in two mouse cancer models that treatment with dalantercept decreases metastases. This is in contrast to VEGF pathway inhibitors that increase metastases in mouse cancer models.

We believe that a combination of ALK1 and VEGF pathway inhibitors could have application in a number of different oncology indications where VEGF pathway inhibitors are currently used. The currently approved VEGF pathway inhibitors include Avastin® (bevacizumab), Cyramza® (ramucirumab), Inlyta® (axitinib), Nexavar® (sorafenib), Stivarga® (regorafenib), Sutent® (sunitinib), Votrient® (pazopanib), Caprelsa® (vandetanib), and Zaltrap® (ziv-aflibercept). Four large markets for which these drugs have been approved are non-small cell lung cancer, colorectal cancer, renal cell carcinoma and liver cancer.

- Non-Small Cell Lung Cancer (NSCLC). The National Cancer Institute estimates there were 224,210 new cases of lung cancer in the United States in 2014 with 159,260 deaths. In 2014, sales of Avastin® in NSCLC were an

estimated $1.2 billion in the United States and $1.8 billion worldwide.

- Colorectal Cancer. The National Cancer Institute estimates there were 136,830 new cases of colon cancer or rectal cancer in the United States in 2014 with 50,310 deaths. In 2014, sales of Avastin® for colorectal cancer were an estimated $1.3 billion in the United States and $3.9 billion worldwide.

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- Renal Cell Carcinoma. The National Cancer Institute estimates there were 63,920 new cases of kidney and renal pelvis cancer in the United States in 2014 with 13,860 deaths. In 2014, U.S. sales of drugs for renal cell carcinoma were $1.6 billion, of which $1.1 billion were anti-angiogenesis drugs that target the VEGF pathway, principally Sutent®, Inlyta®, Votrient® and Avastin®. Worldwide sales in 2014 of drugs for renal cell carcinoma were $3.8 billion, of which $2.8 billion were drugs that target the VEGF pathway.

- Liver Cancer. The National Cancer Institute estimates there were 33,190 new cases of liver cancer in the United States in 2014 with 23,000 deaths. The only drug approved in the United States for the treatment of liver cancer is the VEGF pathway inhibitor Nexavar®. In 2014, sales of Nexavar® for liver cancer were an estimated $215 million in the United States and $771 million worldwide.

- Other Tumors. One or more anti-angiogenesis agents are also approved as treatments for ovarian cancer, neuroendocrine tumors, soft tissue sarcoma, gastric cancer, thyroid cancer and glioblastoma.

The first two cancers for which we are studying the combination of dalantercept plus a VEGF pathway inhibitor are renal cell carcinoma and liver cancer. In renal cell cancer, sunitinib and axitinib are the most prescribed VEGF pathway inhibitors for first and second line patients, respectively. In the first line setting, sunitinib results in progression-free survival rates of approximately 11 months. In the second line setting, for patients whose disease had progressed despite receiving sunitinib in the first line setting, axitinib produced a progression-free survival rate of approximately 4.8 months. We believe the combination of dalantercept plus axitinib in the second line setting has the potential to increase the rate of progression-free survival greater than axitinib alone. In liver cancer, the VEGF pathway inhibitor, sorafenib, is approved in the first line setting yet the unmet medical need remains significant. In the first line setting, sorafenib results in time to progression of approximately 5.5 months.

Dalantercept Clinical and Preclinical Development

Dalantercept is comprised of the extracellular domain of the ALK1 receptor linked to the Fc domain of IgG1. Dalantercept acts as a ligand trap for ligands in the TGF-ß superfamily that signal through the ALK1 receptor. We have completed a Phase 1 trial of dalantercept and are pursuing a program of ongoing and planned Phase 2 trials seeking to demonstrate single agent activity of dalantercept for advanced solid tumors and activity of dalantercept in combination with approved VEGF pathway inhibitors or chemotherapy in advanced solid tumors.

Ongoing Clinical Trials of Dalantercept

We are currently conducting clinical trials of dalantercept in renal cell carcinoma and liver cancer.

Renal Cell Carcinoma - The DART Trial (Dalantercept and Axitinib CompaRed to Placebo and AxiTinib in Patients with Advanced RCC)

We are conducting a two-part Phase 2 clinical trial of dalantercept in combination with axitinib, an approved VEGF pathway inhibitor, in patients with advanced renal cell carcinoma. Part 1 of this trial was designed as a single-arm dose escalation and expansion part with the primary endpoint of evaluating the safety and tolerability of various dose levels of dalantercept in combination with axitinib (Inlyta®) to select a dose level of dalantercept (in combination with axitinib) for further study if merited. Eligible patients for part 1 are those with advanced RCC who have progressed on one prior VEGFR tyrosine kinase inhibitor and no more than 3 prior treatments. The dose levels of dalantercept studied in the dose escalation part were 0.6, 0.9, and 1.2 mg/kg given subcutaneously once every three weeks, and patients received axitinib at a dose level of 5 mg orally twice per day. The number of patients enrolled in part 1 of the trial at the 0.6, 0.9 and 1.2 mg/kg dose levels were six, four and five patients, respectively. The dose levels of 0.9 mg/kg and 1.2 mg/kg were selected for use in the expansion phase and enrollment of part 1 of the trial is complete. The first patient in the trial was first dosed in January 2013. Patients continue to receive dalantercept and axitinib until there is disease progression (either clinically or as measured by RECIST criteria) or the combination is no longer tolerated. Part 2 of the trial was initiated in June 2014 and is a randomized (double-blind) comparison of the selected dose level of dalantercept in combination with axitinib versus axitinib plus placebo in a total of 130 patients. Part 2 of the DART study is open for enrollment of patients who have received one VEGFR TKI and may have also received 1 prior mTOR inhibitor and/or any number of prior immune therapies. The primary endpoint of part 2 of the trial will be

progression-free survival. The trial is currently being conducted in numerous sites in the United States.

Preliminary data from part 1 of the DART trial were presented in an oral session at the American Society of Clinical Oncology (ASCO) 2015 Genitourinary Cancers Symposium held in Orlando, Florida on February 28, 2015. Three cohorts each received dalantercept (0.6, 0.9, or 1.2 mg/kg) subcutaneously once every three weeks and axitinib 5 mg orally twice a day for each 21 day cycle. The 0.9 and 1.2 mg/kg dose levels were expanded. A data cut-off date of January 16, 2015 was used for

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this analysis. Dalantercept in combination with axitinib thus far appears to have an acceptable safety profile with no treatment related grade 4 or 5 adverse events. The combination of dalantercept and axitinib resulted in: objective response rate of 25.0% (7 partial responses of 28), stable disease rate of 60.7% (17 of 28), and a disease control rate at 6 months of 57.1% (16 of 28). The preliminary progression-free survival (PFS) for all three combined dose levels of dalantercept plus axitinib is 8.3 months. As of the cut-off date, the median PFS in the 0.9 mg/kg dose level was not calculable because too many of the patients in this cohort remained on therapy with no disease progression. Common adverse reactions expected with axitinib such as diarrhea, hypertension, palmar-plantar erythrodysesthesia (hand and foot syndrome), and proteinuria did not increase in incidence or severity when combined with dalantercept. Based on the results from part 1, dalantercept 0.9 mg/kg was selected as the dose level in part 2 of the DART study.

We intend to present updated data from the dose escalation and expansion part of this trial at the American Society of Clinical Oncology annual meeting in late May or early June 2015.

Based on currently projected timelines, which are subject to change, we expect to complete enrollment of part 2 of this trial by early 2016, which, if successful, we expect would enable a Phase 3 trial.

Hepatocellular Carcinoma

In 2014, we initiated a Phase 1b single-arm dose finding and expansion clinical trial of dalantercept in combination with sorafenib, an approved VEGF pathway inhibitor, in patients with hepatocellular carcinoma. The primary endpoint of this trial is to evaluate the safety and tolerability of various dose levels of dalantercept in combination with sorafenib. Secondary endpoints are expected to include time to progression, progression-free survival, disease control rate, and overall survival. The initial dose level is 0.6 mg/kg of dalantercept given subcutaneously once every three weeks in combination with 400 mg sorafenib given once daily, with the ability to move to higher or lower doses, depending on safety findings. Each cohort will include up to six patients receiving a single dose level during the dose escalation phase, followed by an expansion phase in up to 20 additional patients. Patients will continue to receive dalantercept and sorafenib until there is disease progression (either clinically or as measured by RECIST criteria) or the combination is no longer tolerated.

Completed Trials of Dalantercept

Dalantercept has been tested as a single-agent therapy in four completed clinical trials. While dalantercept shows activity as a single agent, we believe the greatest potential for dalantercept will be in combination with VEGF pathway inhibitors or in combination with cytotoxic chemotherapy.

Phase 1 Trial

A Phase 1 ascending dose trial evaluated the safety, tolerability, pharmacokinetics and anti-tumor activity of dalantercept in patients with advanced solid tumors. Dalantercept was given subcutaneously approximately once every three weeks until disease progression. Thirty-seven patients were enrolled in dose groups at 0.1, 0.2, 0.4, 0.8, 1.6, 3.2 and 4.8 mg/kg. In this trial, dalantercept demonstrated anti-tumor activity based on decreases or stabilization of tumor size. As shown in the figure below, out of the 29 evaluable patients treated, one (3%) had a partial response and 13 (45%) had stable disease according to RECIST criteria. Of the 13 who experienced stable disease, eight experienced stable disease for at least three months. Treatment continued until the patient experienced progressive disease.

In addition to these effects on tumor size, dalantercept demonstrated likely anti-angiogenic activity evidenced by a reduction of tumor metabolic activity as well as decreases in tumor blood flow. Lastly, some patients were observed to have dilated blood vessels in the skin, similar to those in HHT-2 patients, suggesting ALK1 pathway inhibition.

Squamous Cell Carcinoma of the Head and Neck

We have completed a single agent Phase 2 clinical trial of dalantercept in an ascending dose trial in patients with recurrent or metastatic squamous cell carcinoma of the head and neck. After an initial cohort of two patients treated at a fixed dose level of 80 mg, we amended the trial and began recruitment of patients under the amended protocol in the first quarter of 2012 to study the dose level of 0.6 mg/kg given subcutaneously once every three weeks. The protocol was subsequently amended to increase the dose level of dalantercept to 1.2 mg/kg. Patients continued to receive dalantercept until there is disease progression (either clinically or as measured by analysis of radiographic imaging according to RECIST criteria) or dalantercept is no longer tolerated. The primary outcome measure was objective response rate as measured by RECIST criteria, and there were a number of secondary outcome measures of tumor response. The trial was conducted in 12 centers in the United States, and we completed enrollment in July 2013 with a

total of 46 patients, including two patients treated at the 80 mg dose, 13 at the 0.6 mg/kg dose, and 31 at the 1.2 mg/kg dose. Of these 46 patients, 41 patients (one patient at 80 mg, 13 patients at 0.6 mg/kg, and 27 patients at 1.2 mg/kg) were evaluable for radiological response according to RECIST criteria as of May 13, 2014. The preliminary data for these 41 patients are as follows: no patients at 80 mg, 5 patients (38.5%) at 0.6 mg/kg and 12 patients

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(44.4%) at 1.2 mg/kg achieved stable disease as their best response and, at the 1.2 mg/kg dose level, one patient (3.7%) achieved a partial response. One patient remains on study after 18 months. None of these patients achieved a complete response. These data suggest dalantercept has dose dependent but modest single agent activity in patients with advanced squamous cell carcinoma of the head and neck.

Gynecologic Oncology Group (GOG) Sponsored Trials

The Gynecologic Oncology Group, one of the National Cancer Institute's funded collaborative cancer research groups, sponsored two Phase 2 clinical trials to study the activity of dalantercept at a dose level of 1.2 mg/kg given as a single agent via subcutaneous injection every three weeks. The first trial was in patients with recurrent or persistent endometrial cancer and the second trial is in patients with recurrent or persistent ovarian cancer. Both of these clinical trials were designed as two-part studies to assess the activity of dalantercept based on either of two endpoints: RECIST-defined response rate or progression free survival at 6 months. If there is sufficient activity in the first part of the trial, additional patients will be enrolled in the second, expanded part of the trial. The endometrial cancer study enrolled 28 patients in part 1. Of the 28 patients, 16 (57.1%) achieved stable disease and 5 (17.9%) were alive and progression free for at least 6 months. Of these 5 patients, 3 were alive and progression free without receiving non-protocol therapy for at least 6 months. Fatigue, anemia, constipation, and edema were the most commonly reported toxicities regardless of attribution. The GOG has notified us that there was not sufficient activity to enroll additional patients in the second part of the endometrial cancer trial. The GOG ovarian cancer study enrolled 30 patients to part 1. The study design required at least 7 of 30 patients enrolled in part 1 of the study to be progression free for greater than six months in order to trigger the enrollment of approximately an additional 30 patients for part 2 of this study. In part 1 of the study, 6 patients were progression free without receiving non-protocol therapy for greater than six months. Based on these results, patients will not be enrolled in the second part of the trial.

Safety

In clinical trials to date, dalantercept has been generally well-tolerated. In the initial Phase 1 clinical trial in advanced cancer patients, five patients out of 37 experienced serious adverse events deemed treatment-related that were reported as left ventricular dysfunction, fatigue, fluid overload, and congestive heart failure. Three of these patients had prior coronary artery disease. In subsequent trials fluid overload has generally been successfully managed with diuretics. Two patients in the head and neck cancer clinical trial experienced serious adverse events of fluid accumulation around the lungs that were determined to be possibly related to dalantercept. Another patient in the head and neck trial has experienced serious adverse events of tracheal obstruction and pulmonary edema that were determined to be possibly related to dalantercept. In the clinical trial of patients with endometrial cancer, seven patients experienced treatment-related serious adverse events reported as fluid accumulation in the abdominal cavity, fluid accumulation around the lungs, rectal fistula, gastric bleeding, vomiting, anemia, and shortness of breath. In the clinical trial of patients with ovarian cancer, one patient experienced treatment related serious adverse events reported as hypokalemia (decreased potassium), anorexia, dehydration and increased creatinine, one patient experienced a treatment related serious adverse event of shortness of breath and one patient reported an onset of heart failure and shortness of breath. In the renal cell carcinoma trial, there has been one dalantercept-related serious adverse events of fluid overload and shortness of breath. Adverse events associated with axitinib did not occur with higher than expected frequency or severity.

Dalantercept Investigational New Drug (IND) Applications

Dalantercept is being studied in the United States under an IND that we submitted to the FDA on July 29, 2009 for the treatment of patients with advanced solid tumors or multiple myeloma.

Preclinical Studies

We have demonstrated that dalantercept as a single agent inhibits tumor growth and angiogenesis in a variety of mouse models of cancer. Importantly, we have shown that dalantercept is a potent inhibitor of the maturation stage of angiogenesis. This is in contrast with VEGF pathway inhibitors that target the proliferative stage of angiogenesis. We also demonstrated that dalantercept in combination with a VEGF pathway inhibitor provides enhanced anti-tumor effects. In mice bearing human renal cell carcinoma xenografts, we and our academic collaborators have shown that simultaneous administration of both dalantercept and sunitinib, a VEGF-receptor tyrosine kinase inhibitor, had substantially greater efficacy than either agent alone. In another mouse model of human renal cell carcinoma that

develops resistance to sunitinib, tumor growth was blocked by the simultaneous administration of dalantercept. The figures below summarize those results.

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Dalantercept/Sunitinib Combination
Exceeds Activity of Either Alone
(Mouse Model of Renal Cell Carcinoma (A498))

Dalantercept/Sunitinib Combination
Slows Tumor Growth in a Sunitinib Resistant Model
(Mouse Model of Renal Cell Carcinoma (786O))

Collaboration with Drs. Wang, Bhatt, Mier, Atkins; Beth Israel Deaconess Medical Center, Boston

ACE-083 Clinical and Preclinical Development

We are developing a novel therapeutic candidate, ACE-083, for a first-in-human clinical trial that we initiated in 2014. ACE-083 acts as a trap for ligands in the TGF-ß superfamily that are known to be involved in the regulation of muscle mass. By inhibiting these ligands, ACE-083 can increase muscle mass, as we have demonstrated in animal studies. ACE-083 has been designed to affect those muscles in which the drug is injected. In preclinical animal studies, ACE-083 has shown dose dependent increases in muscle mass in the injected muscles but no systemic increases in muscle mass. We are focused on the development of ACE-083 for diseases in which increases in the size and function of specific muscles may provide a clinical benefit, including inclusion body myositis, facioscapulohumeral dystrophy (FSHD) and disuse atrophy.

We are conducting a double-blind, placebo-controlled, randomized ascending dose Phase 1 clinical trial of ACE-083 in healthy volunteers. The clinical trial is designed as a two-part trial, with an ascending single dose part to evaluate the safety and tolerability of ACE-083 as a local muscle injection, and with a multiple dose part in which subjects are administered two doses of ACE-083 3 weeks apart. The doses studied are 50, 100 and 200 mg given as a local muscle injection in the single dose part. In the multiple dose part, 100 and 200 mg are given as a local muscle injection on day 1 and day 22. Each cohort included eight patients, 6 active and 2 placebo subjects per cohort. The first subject in the single dose part of this trial was first treated in October 2014, and the first patient in the multiple dose part of this trial was first treated in February, 2015. We have currently completed enrollment in all of the single dose cohorts and we are now enrolling patients in the multiple dose cohorts of the trial. This trial is being conducted at one site in the United States and may enroll up to 40 subjects.

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ACE-083 Selectively Doubles Muscle Mass in
Injected Muscle with One Month of Treatment

** p<0.05 vs. PBS (placebo) & vs. non-injected leg

Our Preclinical Pipeline

We are using our discovery platform and knowledge of the TGF-ß superfamily to design and evaluate promising new therapeutic candidates that inhibit ligands of the TGF-ß superfamily. Additionally, in 2014 we expanded our discovery platform by entering a collaboration agreement with Adimab LLC under which Adimab will use its proprietary antibody discovery platform to generate fully human antibodies against selected targets.

We have preclinical stage therapeutic candidates in our pipeline that have shown promising activity in animal models such as:

- increase in systemic muscle mass;
- inhibition of liver fibrosis in mouse models of this condition;
- improvement of cardiovascular function in a mouse model of a fibrotic disorder of the lungs; and
- improvement in diseases of the eye such as in a mouse laser-induced neovascularization model of age-related macular degeneration (AMD).

Our Strategic Partnerships

Collaborations with corporate partners have provided us with significant funding and access to our partners' scientific, development, regulatory and commercial capabilities. We have received more than $281.0 million from our collaborations with Celgene, Alkermes plc (Alkermes) and our terminated collaboration with Shire AG (Shire).

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Celgene

On February 20, 2008 we entered into an agreement, which we refer to as the Sotatercept Agreement, with Celgene Corporation, under which we granted to Celgene worldwide rights to sotatercept. On August 2, 2011 we entered into a second agreement with Celgene for luspatercept, which we refer to as the Luspatercept Agreement under which we granted to Celgene worldwide rights to luspatercept and also amended certain terms of the Sotatercept Agreement. These agreements provide Celgene exclusive licenses for these therapeutic candidates in all indications, as well as exclusive rights to obtain a license to certain future compounds.

Sotatercept Agreement. Under the terms of the Sotatercept Agreement, we and Celgene are collaborating on the development and commercialization of sotatercept. We also granted Celgene an option to license discovery stage compounds against three specified targets. Celgene paid $45.0 million and bought $5.0 million of equity upon execution of the Sotatercept Agreement and, as of December 31, 2014, we have received $42.3 million in research and development funding and milestone payments for the sotatercept program.

We retained responsibility for research, development through the end of Phase 2a clinical trials, as well as manufacturing the clinical supplies for these trials. These activities are substantially complete. Celgene is conducting the current Phase 2 trials for ß-thalassemia, MDS and chronic kidney disease and will be responsible for any future clinical trials for sotatercept as well as for all future manufacture of sotatercept. We are eligible to receive future development, regulatory and commercial milestones of up to $360.0 million for the sotatercept program and up to an additional $348.0 million for each of the three discovery stage programs. None of the three discovery stage programs has advanced to the stage to achieve payment of a milestone, nor do we expect any such milestone payments in the near future.

Luspatercept Agreement. Under the terms of the Luspatercept Agreement, we and Celgene are collaborating in the development and commercialization of luspatercept. We also granted Celgene an option to license products for which Acceleron files an investigational new drug application for the treatment of anemia. Celgene paid $25.0 million to us upon execution of the Luspatercept Agreement in August 2011 and, as of December 31, 2014, we have received $44.4 million in research and development funding and milestone payments for the luspatercept program.

Under this agreement, we retained responsibility for research, development through the end of Phase 1 and the two ongoing Phase 2 clinical trials in MDS and ß-thalassemia, as well as manufacturing the clinical supplies for these studies. Celgene will conduct subsequent Phase 2 and Phase 3 clinical trials. Acceleron will manufacture luspatercept for all Phase 1 and Phase 2 clinical trials, and Celgene will have responsibility for the manufacture of luspatercept for Phase 3 clinical trials and commercial supplies. We are eligible to receive future development, regulatory and commercial milestones of up to $200.0 million for the luspatercept program.

In November 2013, the Company has agreed to conduct additional development activities including clinical and non-clinical services, which are reimbursed under the same terms and rates of the existing Agreements. Please refer to Note 9 to the financial statements in this Annual Report on Form 10-K for the revenue recognition accounting, including changes in estimates, pursuant to the revenue recognition accounting literature.

Both Agreements. Under each agreement, the conduct of the collaboration is managed by a Joint Development Committee and Joint Commercialization Committee. Other than with respect to certain matters related to our conduct of Phase 2 trials, in the event of a deadlock of a committee, the resolution of the relevant issue is determined by Celgene. Prior to January 1, 2013, Celgene paid the majority of development costs under the Sotatercept and Luspatercept Agreements. As of January 1, 2013, Celgene became responsible for paying 100% of worldwide development costs for both programs. Celgene will be responsible for all commercialization costs worldwide. We are obligated to co-promote sotatercept, luspatercept and future products, in each case if approved, under both agreements in North America, and Celgene will pay all costs related thereto. We will receive tiered royalties in the low-to-mid 20% range on net sales of sotatercept and luspatercept. The royalty schedules for sotatercept and luspatercept are the same. Celgene is obligated to use commercially reasonable efforts to develop and commercialize sotatercept and luspatercept. Celgene may determine that it is commercially reasonable to develop and commercialize only luspatercept or sotatercept and discontinue the development or commercialization of the other therapeutic candidate, or Celgene may determine that it is not commercially reasonable to continue development of one or both of sotatercept and luspatercept. In the event of any such decision, we may be unable to progress the discontinued

candidate or candidates ourselves. The agreements are terminable by either party upon a breach that is uncured and continuing or by Celgene for convenience on a country by country or product by product basis, or in its entirety. Celgene may also terminate the agreement, in its entirety or on a product by product basis, for failure of a product to meet a development or clinical trial endpoint. Termination for cause by us or termination by Celgene for convenience or failure to meet an endpoint will have the effect of terminating the applicable license, while termination for cause by Celgene will have the effect of reducing remaining royalties by a certain percentage.

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Other Collaborations

Alkermes. On December 3, 2009, we entered into a Collaboration and License Agreement with Alkermes relating to a proprietary technology platform for extending the circulating half-life of certain proteins. Under the terms of the agreement, we granted Alkermes worldwide rights to apply this technology to proteins outside of the TGF-ß superfamily in return for an upfront license payment. We are entitled to future development, regulatory and sales milestones and mid-single digit royalties on product sales for each drug developed and commercialized by Alkermes using this technology. To our knowledge, Alkermes is not currently pursuing this collaboration.

Shire. On September 8, 2010, we entered into an agreement with Shire AG for the joint development and commercialization of ACE-031, a clinical stage therapeutic candidate. We granted Shire an exclusive license in markets outside of North America. Under the terms of the agreement, Shire made an upfront cash payment of $45.0 million. We received $9.0 million in research and development payments from Shire during the term of the agreement. In April 2013, we and Shire determined not to further advance the development of ACE-031, and Shire terminated our collaboration agreement, effective as of June 30, 2013 and all rights reverted to us. We currently have no plans to continue the development of ACE-031.

Competition

The development and commercialization of new drugs is highly competitive. We and our collaborators will face competition with respect to all therapeutic candidates we may develop or commercialize in the future from pharmaceutical and biotechnology companies worldwide. Many of the entities developing and marketing potentially competing products have significantly greater financial resources and expertise than we do in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing. Our commercial opportunity will be reduced or eliminated if our competitors develop and commercialize products that are more effective, have fewer side effects, are more convenient or are less expensive than any products that we may develop.

If our clinical stage therapeutic candidates are approved, they will compete with currently marketed drugs and therapies used for treatment of the following indications, and potentially with drug candidates currently in development for the same indications:

ß-thalassemia

If either luspatercept is approved for the treatment of patients with ß-thalassemia, it would compete with:

- Red blood cell transfusions and iron chelation therapy, such as Novartis's oral iron chelating agent, Exjade®. We are also aware that Shire is studying a new oral iron chelator, SHP602, in clinical trials, and is currently on clinical hold. Sideris Pharmaceuticals is developing an oral iron chelator, SP-420, that is currently in Phase 1 clinical trials. Novartis has been granted an exclusive right to acquire Sideris and its lead asset, SP-420.

- Fetal hemoglobin stimulating agents, such as hydroxyurea, which are primarily used to treat patients with anemia from sickle cell disease, are sometimes used to treat patients with ß-thalassemia. In addition, HQK-1001, a fetal hemoglobin stimulating agent being developed by HemaQuest Pharmaceuticals, Inc., has completed a Phase 1/2 clinical trial and an investigator sponsored Phase 2 clinical trial in patients with ß-thalassemia.

- Hematopoietic stem cell transplant treatment is given to a small percentage of patients with ß-thalassemia, since it requires a sufficiently well-matched source of donor cells. Certain academic centers around the world are seeking to develop improvements to this approach.

- Other therapies in development, including gene therapy and genome editing are being developed by several different groups, including bluebird bio, Inc., Memorial Sloan Kettering Cancer Center, GlaxoSmithKline plc, and Sangamo BioSciences Inc. in collaboration with Biogen Idec.

MDS

If either luspatercept or sotatercept is approved for the treatment of patients with MDS, it would compete with the following:

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Recombinant erythropoietin and other erythropoiesis stimulating agents. Although these agents are not approved to treat anemia in MDS, current practice guidelines include the use of erythropoiesis stimulating agents and granulocyte colony stimulating factor agents (G-CSF) to treat patients with MDS. Additionally, Amgen is currently studying erythropoiesis stimulating agent, Aranesp® and Janssen Pharmaceuticals is studying erythropoiesis stimulating agent Eprex® in Phase 3 clinical trials in Europe for treatment of anemia in patients with lower risk MDS.

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- Red blood cell transfusion and iron chelation therapy, including Exjade®, which is used to treat anemia in patients with MDS.

- Immunomodulators, including Celgene's approved product, Revlimid® (lenalidomide), for the treatment of anemia of certain MDS patients.

- Eli Lilly and Company is studying TGF-ß receptor I kinase inhibitor, LY2157299 in a phase 2 study in lower risk MDS patients with anemia.

- Other therapies in development, including: an oral form of the hypomethylating agent azacitidine, known as CC-486, being developed by Celgene to treat patients with transfusion dependent anemia and thrombocytopenia due to lower risk MDS, which is currently in Phase 3 clinical trials in the United States and Europe; an anti-cancer therapy being developed by Onconova to treat patients with MDS; and a CD95 ligand inhibitor, APG101, being studied by Apogenix in a phase 1 study in transfusion dependent, lower risk MDS patients.

Chronic Kidney Disease

If sotatercept is approved for the treatment of anemia in patients with chronic kidney disease (CKD), it would compete with erythropoiesis stimulating agents that have been approved to treat these patients for over 20 years. In 2011, the Centers for Medicare and Medicaid Services (CMS) changed the reimbursement practice for erythropoiesis stimulating agents in chronic kidney disease patients on dialysis, which has led to changes in the way erythropoiesis stimulating agents are used in clinical practice, including decreasing the number of patients treated with erythropoiesis stimulating agents as well as decreasing the average dose and duration of therapy. Additionally, beginning in 2014 Roche was able to begin marketing Mircera®, an erythropoiesis stimulating agent, to treat anemia associated with chronic renal failure in patients on and not on dialysis, in the U.S. under a limited license agreement with Amgen. These changes and the anticipated future introduction of biosimilar erythropoiesis stimulating agents are expected to generate additional price pressure in this market. Additionally, we are aware that Astellas Pharma and Fibrogen are developing oral, small molecule treatments that increase the production of erythropoietin to treat patients with anemia. If sotatercept is approved to treat certain aspects of chronic kidney disease-mineral and bone disorder (CKD-MBD), other drugs approved for the treatment of these patients could be considered competitive. CKD-MBD is a systemic disorder encompassing mineral, bone, and calcific cardiovascular abnormalities that develop as a complication of CKD and that contribute to CKD-related cardiovascular disease and high mortality rates. Therapies approved to treat aspects of CKD-MBD include phosphate binders to address hyperphosphatemia, including Sanofi’s Renagel® and Renvela® , Shire’s Fosrenol®,and Keryx’s newly approved product Auryxia®. Amgen’s oral calcimimetic product Sensipar®/Mimpara® is approved to treat secondary hyperparathyroidism in CKD patients on dialysis. Amgen is also studying AMG-416, an intravenously administered calcium sensing receptor agonist, in Phase 3 trials to treat secondary hyperparathyroidism in chronic kidney disease patients on dialysis.

Oncology Therapies

We are developing dalantercept to be used in combination with VEGF pathway inhibitors for the treatment of cancer. If dalantercept is approved, it would compete with the following.

- Tracon is developing TRC105, an antibody to endoglin, which is a protein in the TGF-ß superfamily that is overexpressed on endothelial cells and plays a role in angiogenesis. TRC105 is currently being studied in Phase 1 and Phase 2 clinical trials for the treatment of multiple solid tumor types, including soft tissue sarcoma, renal cell carcinoma, glioblastoma, hepatocellular carcinoma and colorectal cancer, in combination with approved VEGF inhibitors.

- Pfizer's fully human monoclonal antibody against the ALK1 receptor is currently being studied in a Phase 1 investigator-sponsored trial in patients with colorectal cancer, in combination with Stivarga® (regorafenib).

Other non-VEGF angiogenesis inhibitors in development, which also have the potential to be combined with VEGF pathway inhibitors or used independently of VEGF pathway inhibitors to inhibit angiogenesis. Amgen, Regeneron, MedImmune, and OncoMed Pharmaceuticals are each developing non-VEGF angiogenesis inhibitors.

In addition to the therapies mentioned above, there are many generic chemotherapy agents and other regimens commonly used to treat various types of cancer, including renal cell carcinoma and hepatocellular carcinoma.

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Therapies for Treating Muscle Loss

We are currently studying ACE-083 in a Phase 1 clinical trial in healthy volunteers and plan to develop ACE-083 for the treatment of neuromuscular disorders and other diseases characterized by a loss of muscle function. We are aware of other approaches to treating muscle loss that are in clinical trials. Novartis is developing bimagrumab (BYM338), a monoclonal antibody targeting the activin receptor type IIB (ActRIIB), in various Phase 2 clinical trials to treat pathological muscle loss and weakness and in Phase a 2/3 clinical trial to treat patients with sporadic inclusion body myositis (sIBM). Lilly is developing, LY2495655, a myostatin monoclonal antibody in Phase 2 clinical trials for disuse muscle atrophy and cancer-related cachexia. Regeneron and Sanofi are developing a myostatin monoclonal antibody, REGN1033 (SAR391786), which is in Phase 2 clinical development for treatment of sarcopenia. Pfizer is conducting a phase 2 clinical study for PF-06252616, a myostatin antibody, in patients with Duchenne muscular dystrophy (DMD). Nationwide Children's Hospital, in collaboration with The Myositis Association, Parent Project Muscular Dystrophy and Milo Biotechnology, are conducting a Phase 1 clinical trial of a gene therapy delivery of follistatin (FS344) to muscle in patients with Becker muscular dystrophy (BMD) and sporadic inclusion body myositis (sIBM). Biogen Idec has completed a Phase 1 clinical trial of BIIB023, a monoclonal antibody targeting the tumor necrosis factor (TNF)-like weak inducer of apoptosis (TWEAK), to evaluate its effects on muscle atrophy in healthy male volunteers. Atara Bio and BMS are also each developing programs utilizing the myostatin pathway to increase muscle mass and/or strength.

The key competitive factors affecting the success of any approved product will be its efficacy, safety profile, price, method of administration and level of promotional activity.

Commercialization

We retain co-promotion rights with our collaboration partner, Celgene, for both sotatercept and luspatercept in North America, and under the terms of our agreements with Celgene, our commercialization costs will be entirely funded by Celgene. We also currently retain worldwide commercialization rights for our oncology therapeutic candidate, dalantercept, and our muscle therapeutic candidate, ACE-083. We intend to build hematology, oncology and neuromuscular disorder focused, specialty sales forces in North America and, possibly, other markets to effectively support the commercialization of these and future products. We believe that a specialty sales force will be sufficient to target key prescribing physicians in these areas. We currently do not have any sales or marketing capabilities or experience. We will establish the required capabilities within an appropriate time frame ahead of any product approval and commercialization to support a product launch. If we are not able to establish sales and marketing capabilities or are not successful in commercializing our future products, either on our own or through collaborations with Celgene, any future product revenue will be materially adversely affected.

Intellectual Property

Our commercial success depends in part on our ability to obtain and maintain proprietary protection for our therapeutic candidates, novel biological discoveries, screening and drug development technology, to operate without infringing on the proprietary rights of others and to prevent others from infringing our proprietary rights. Our policy is to seek to protect our proprietary position by, among other methods, filing U.S. and foreign patent applications related to our proprietary technology, inventions and improvements that are important to the development and implementation of our business. We also rely on trade secrets, know-how, continuing technological innovation and potential in-licensing opportunities to develop and maintain our proprietary position. Additionally, we expect to benefit from a variety of statutory frameworks in the United States, Europe and other countries that relate to the regulation of biosimilar molecules and orphan drug status. These statutory frameworks provide periods of non-patent-based exclusivity for qualifying molecules. See "Government Regulations".

Our patenting strategy is focused on our therapeutic candidates. We seek composition-of-matter and method-of-treatment patents for each such protein in key therapeutic areas. We also seek patent protection with respect to companion diagnostic methods and compositions and treatments for targeted patient populations. We have sought patent protection alone or jointly with our collaborators, as dictated by our collaboration agreements.

Our patent estate, on a worldwide basis, includes approximately 140 issued patents and approximately 370 pending patent applications, with pending and issued claims relating to all of our current clinical stage therapeutic candidates, sotatercept, luspatercept, dalantercept and ACE-083. These figures include in-licensed patents and patent applications

to which we hold exclusive commercial rights.

Individual patents extend for varying periods of time depending on the date of filing of the patent application or the date of patent issuance and the legal term of patents in the countries in which they are obtained. Generally, patents issued from applications filed in the United States are effective for twenty years from the earliest non-provisional filing date. In addition, in certain instances, a patent term can be extended to recapture a portion of the term effectively lost as a result of the FDA regulatory review period, however, the restoration period cannot be longer than five years and the total patent term including the restoration period must not exceed 14 years following FDA approval. The duration of foreign patents varies in accordance

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with provisions of applicable local law, but typically is also twenty years from the earliest international filing date. Our issued patents and pending applications with respect to our therapeutic candidates will expire on dates ranging from 2026 to 2035, exclusive of possible patent term extensions, However, the actual protection afforded by a patent varies on a product by product basis, from country to country and depends upon many factors, including the type of patent, the scope of its coverage, the availability of extensions of patent term, the availability of legal remedies in a particular country and the validity and enforceability of the patent.

National and international patent laws concerning therapeutic candidates remain highly unsettled. No consistent policy regarding the patent-eligibility or the breadth of claims allowed in such patents has emerged to date in the United States, Europe or other countries. Changes in either the patent laws or in interpretations of patent laws in the United States and other countries can diminish our ability to protect our inventions and enforce our intellectual property rights. Accordingly, we cannot predict the breadth or enforceability of claims that may be granted in our patents or in third-party patents. The biotechnology and pharmaceutical industries are characterized by extensive litigation regarding patents and other intellectual property rights. Our ability to maintain and solidify our proprietary position for our drugs and technology will depend on our success in obtaining effective claims and enforcing those claims once granted. We do not know whether any of the patent applications that we may file or license from third parties will result in the issuance of any patents. The issued patents that we own or may receive in the future, may be challenged, invalidated or circumvented, and the rights granted under any issued patents may not provide us with sufficient protection or competitive advantages against competitors with similar technology. Furthermore, our competitors may be able to independently develop and commercialize similar drugs or duplicate our technology, business model or strategy without infringing our patents. Because of the extensive time required for clinical development and regulatory review of a drug we may develop, it is possible that, before any of our drugs can be commercialized, any related patent may expire or remain in force for only a short period following commercialization, thereby reducing any advantage of any such patent. The patent positions for our most advanced programs are summarized below:

Sotatercept Patent Coverage

We hold two issued patents covering the sotatercept composition of matter in the United States, one issued patent in Europe (registered in most countries of the European Patent Convention) and additional patents issued or pending in many other major jurisdictions worldwide, including Japan, China, South Korea, Brazil, Mexico, Russia, Israel and India. The expected expiration date for these composition of matter patents is 2026, exclusive of possible patent term extensions.

We hold two issued patents covering the treatment of anemia by administration of sotatercept in the United States and similar patents issued or pending in many other major jurisdictions worldwide, including Europe, Japan, China, South Korea, Brazil, Mexico, Russia, Israel and India. The expected expiration date for these composition of matter patents is 2027, exclusive of possible patent term extensions.

We also hold patents and patent applications directed to a variety of other uses for sotatercept, including the reduction of tumor cell burden in multiple myeloma and the treatment of bone loss in patients with chronic kidney disease.

Luspatercept Patent Coverage

We hold two issued patents covering the luspatercept composition of matter in the United States, and additional patents issued or pending in many other major jurisdictions worldwide, including Europe, Japan, China, South Korea, Brazil, Mexico, Russia and India. The expected expiration dates for these composition of matter patents are 2028 and 2029, exclusive of possible patent term extensions.

We hold two issued patents covering the treatment of anemia by administration of luspatercept in the United States and similar patents issued or pending in other major jurisdictions worldwide, including Europe, Japan, China, South Korea, Brazil, Mexico, Russia and India. The expected expiration date for these method of treatment patents is 2029, exclusive of possible patent term extensions.

We also hold patent applications directed to a variety of other uses for luspatercept, including the treatment of complications of thalassemia, such as iron overload and ulcers, and treatment of patient sub-groups with MDS. The expected expiration date for these method of treatment patents ranges from 2029 to 203,5 exclusive of possible patent term extensions.

Dalantercept Patent Coverage

We hold one issued patent covering the dalantercept composition of matter in the United States, which is expected to expire in 2029, exclusive of possible patent term extensions, and we hold additional pending patent applications. We hold additional issued patents and pending patent applications covering composition of matter in many other major jurisdictions worldwide, including Europe, Japan, China, South Korea, Brazil, Mexico, Russia and India. The expected expiration dates for

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these patent filings claiming the dalantercept composition of matter, if issued, are either 2027 or 2029, exclusive of possible patent term extensions.

We hold one issued patent covering the treatment of tumor angiogenesis by administration of dalantercept in the United States and similar patents issued or pending in other major jurisdictions worldwide, including Europe, Japan, China, South Korea, Brazil, Mexico, Russia and India. The expected expiration date for these method of treatment patents is 2027, exclusive of possible patent term extensions.

We also hold patent applications directed to a variety of other uses for dalantercept, including the treatment of renal cell carcinoma with a combination of dalantercept and a VEGF-targeted tyrosine kinase inhibitor. This patent application is jointly invented and owned with the Beth Israel Deaconess Medical Center, or BIDMC, and we have secured an exclusive license to the BIDMC rights. The expected expiration date for these patent applications, should they issue as patents, is 2033 plus any extensions of term available under national law.

ACE-083 Patent Coverage

We hold two pending patent applications covering the ACE-083 composition of matter in the United States, which, if issued are expected to expire in 2028 and 2035, respectively, exclusive of possible patent term extensions. These patent applications are also eligible for filing in major jurisdictions worldwide.

Trade Secrets

In addition to patents, we rely upon unpatented trade secrets and know-how and continuing technological innovation to develop and maintain our competitive position. We seek to protect our proprietary information, in part, using confidentiality agreements with our commercial partners, collaborators, employees and consultants and invention assignment agreements with our employees. These agreements are designed to protect our proprietary information and, in the case of the invention assignment agreements, to grant us ownership of technologies that are developed through a relationship with a third party. These agreements may be breached, and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors. To the extent that our commercial partners, collaborators, employees and consultants use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

In-Licenses

Effective June 21, 2012, we entered into a license agreement with the Beth Israel Deaconess Medical Center, or BIDMC, to obtain worldwide, exclusive rights under patent filings jointly invented by us and BIDMC. The patent rights relate to the treatment of renal cell cancer by combination therapy with dalantercept and VEGF-receptor tyrosine kinase inhibitors (TKIs). The intellectual property includes one pending U.S. patent filing and one pending PCT (international) patent filing. If issued, the patents are predicted to expire in 2033. Under the agreement, BIDMC retained rights, on behalf of itself and other non-profit academic institutions, to practice under the licensed rights for non-profit purposes. The license rights granted to us are further subject to any rights the United States Government may have in such licensed rights due to its sponsorship of research that led to the creation of the licensed rights. We agreed to pay BIDMC specified development and sales milestone payments aggregating up to $1.0 million. In addition, we are required to pay BIDMC royalties in the low single-digits on worldwide net product sales of drug labeled for treatment regimens that are claimed in the licensed patents. The agreement terminates upon the expiration of the last valid claim of the licensed patent rights. We may terminate the agreement at any time by giving BIDMC advance written notice. The agreement may also be terminated by BIDMC in the event of a material breach by us or in the event we become subject to specified bankruptcy or similar circumstances. In any termination event, we retain our joint ownership of the patent rights and a worldwide non-exclusive license with right to sublicense.

In August 6, 2010, we entered into an amended and restated license agreement with the Ludwig Institute for Cancer Research, or LICR, to obtain worldwide, exclusive rights under patent filings solely owned by LICR and patent rights jointly invented by us and LICR. The LICR-owned patent rights relate to the first cloning of the type I activin receptors, ALK1, ALK2, ALK3, ALK4, ALK5 and ALK6, and include claims to nucleic acids, proteins and antibodies with respect to each of the foregoing. These patent rights expire between the years 2013 and 2018. The license excludes the rights with regard to anti-ALK2 antibodies. The joint patent rights relate to the treatment of pancreatic tumors with dalantercept and, if issued, such patent rights are expected to expire in 2029. Under the

agreement, LICR retained rights, on behalf of itself and other non-profit academic institutions, to practice under the licensed rights for non-profit purposes. We agreed to pay LICR specified development and sales milestone payments aggregating up to $1.6 million for dalantercept. In addition, we are required to pay LICR royalties in the low single-digits on worldwide net product sales of products claimed in the licensed patents, with royalty obligations continuing at a 50% reduced rate for eight years after patent expiration. If we sublicense the LICR patent rights, we will owe LICR a percentage of sublicensing revenue, excluding payments based on the level of sales, profits or other levels of commercialization. The agreement terminates upon the expiration of royalty obligations. We may terminate the agreement at

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any time by giving LICR advance written notice. The agreement may also be terminated by LICR in the event of a material breach by us or in the event we become subject to specified bankruptcy or similar circumstances. In any termination we retain our joint ownership right in the jointly owned patent filings.

In August 2010, we entered into two amended and restated license agreements with the Salk Institute for Biological Studies, or Salk, providing rights under U.S. patent filings solely owned by Salk. The agreements for the licensed patent rights relate to the first cloning of the type II activin receptors, human ActRIIA and frog ActRIIB, respectively, and include claims to vertebrate homolog nucleic acids and proteins with respect to each of the foregoing. These patent rights expire between the years 2016 and 2017. One of these agreements relates to ActRIIA and sotatercept; the other agreement relates to ActRIIB, luspatercept and the discontinued program ACE-031, which we refer to as the ActRIIB Agreement. The licenses granted are exclusive as to the therapeutic products that are covered by the patents and non-exclusive as to diagnostic products and other products that are developed using the Salk patent rights. If we sublicense the Salk patent rights, we will owe Salk a percentage of sublicensing revenue, excluding payments based on sales. Under the agreements, Salk retained rights, on behalf of itself and other non-profit academic institutions, to practice under the licensed rights for non-profit purposes. We agreed to pay Salk specified development milestone payments totaling up to $2.0 million for sotatercept and $0.7 million for luspatercept. In addition, we are required to pay Salk royalties in the low single-digits on worldwide net product sales by us or our sublicensees of products claimed in the licensed patents, or derived from use of the licensed patent rights, with royalty obligations continuing at a reduced rate for a period of time after patent expiration. The agreements terminate upon the expiration of royalty obligations. We may terminate either agreement at any time by giving Salk advance written notice. Either agreement may also be terminated by Salk in the event of a material breach by us or in the event we become subject to bankruptcy or similar circumstances.

In October 2012, Salk filed a lawsuit against us alleging that we breached the ActRIIB Agreement. In July 2014, we settled the Salk lawsuit and entered into an amendment to the ActRIIB Agreement with Salk. Pursuant to the settlement, we made a one-time total payment of $5 million, inclusive of interest, to Salk and we agreed to pay Salk 6% of future development milestone payments received under the agreement with Celgene relating to luspatercept. Finally, we and Salk have further agreed that the royalty percentage on net sales of luspatercept will remain at 1% as provided in the ActRIIB Agreement with Salk, and that such royalty will be payable until June 2022.

Government Regulation

The preclinical studies and clinical testing, manufacture, labeling, storage, record keeping, advertising, promotion, export, marketing and sales, among other things, of our therapeutic candidates and future products, are subject to extensive regulation by governmental authorities in the United States and other countries. In the United States, pharmaceutical products are regulated by the FDA under the Federal Food, Drug, and Cosmetic Act and other laws, including, in the case of biologics, the Public Health Service Act. We expect sotatercept, luspatercept, dalantercept and ACE-083 to be regulated by the FDA as biologics and to be reviewed by the Center for Drug Evaluation and Research (CDER) as proteins intended for therapeutic use. Therapeutic candidates require the submission of a Biologics License Application, or BLA, and approval by the FDA prior to being marketed in the U.S. Manufacturers of therapeutic candidates may also be subject to state regulation. Failure to comply with FDA requirements, both before and after product approval, may subject us or our partners, contract manufacturers, and suppliers to administrative or judicial sanctions, including FDA refusal to approve applications, warning letters, product recalls, product seizures, total or partial suspension of production or distribution, fines and/or criminal prosecution.

The steps required before a biologic may be approved for marketing of an indication in the United States generally include:

- completion of preclinical laboratory tests, animal studies and formulation studies conducted according to Good Laboratory Practices, or GLPs, and other applicable regulations;
- submission to the FDA of an Investigational New Drug application or IND, which must become effective before human clinical trials may commence;
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completion of adequate and well-controlled human clinical trials in accordance with Good Clinical Practices, or GCPs, to establish that the biological product is "safe, pure and potent", which is analogous to the safety and efficacy approval standard for a chemical drug product for its intended use;

- submission to the FDA of a BLA;

- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities at which the product is produced to assess compliance with applicable current Good Manufacturing Practice requirements, or cGMPs; and

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- FDA review of the BLA and issuance of a biologics license which is the approval necessary to market a therapeutic candidate.

Preclinical studies include laboratory evaluation of product chemistry, toxicity and formulation as well as animal studies to assess the potential safety and efficacy of the biologic candidate. Preclinical studies must be conducted in compliance with FDA regulations regarding GLPs. The results of the preclinical tests, together with manufacturing information and analytical data, are submitted to the FDA as part of an IND. Some preclinical testing may continue even after the IND is submitted. In addition to including the results of the preclinical testing, the IND will also include a protocol detailing, among other things, the objectives of the clinical trial, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated if the first phase or phases of the clinical trial lends themselves to an efficacy determination. The IND will automatically become effective 30 days after receipt by the FDA, unless the FDA within the 30-day time period places the IND on clinical hold because of its concerns about the drug candidate or the conduct of the trial described in the clinical protocol included in the IND. The IND sponsor and the FDA must resolve any outstanding concerns before clinical trials can proceed.

All clinical trials must be conducted under the supervision of one or more qualified principal investigators in accordance with GCPs. They must be conducted under protocols detailing the objectives of the applicable phase of the trial, dosing procedures, research subject selection and exclusion criteria and the safety and effectiveness criteria to be evaluated. Each protocol must be submitted to the FDA as part of the IND, and progress reports detailing the status of the clinical trials must be submitted to the FDA annually. Sponsors also must timely report to the FDA serious and unexpected adverse reactions, any clinically important increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator's brochure, or any findings from other studies or animal or in vitro testing that suggest a significant risk in humans exposed to the drug. An institutional review board, or IRB, at each institution participating in the clinical trial must review and approve the protocol before a clinical trial commences at that institution, approve the information regarding the trial and the consent form that must be provided to each research subject or the subject's legal representative, and monitor the study until completed.

Clinical trials are typically conducted in three sequential phases, but the phases may overlap and different trials may be initiated with the same drug candidate within the same phase of development in similar or differing patient populations. Phase 1 trials may be conducted in a limited number of patients, but are usually conducted in healthy volunteer subjects. The drug candidate is initially tested for safety and, as appropriate, for absorption, metabolism, distribution, excretion, pharmacodynamics and pharmacokinetics.

Phase 2 usually involves trials in a larger, but still limited, patient population to evaluate preliminarily the efficacy of the drug candidate for specific, targeted indications to determine dosage tolerance and optimal dosage and to identify possible short-term adverse effects and safety risks.

Phase 3 trials are undertaken to further evaluate clinical efficacy of a specific endpoint and to test further for safety within an expanded patient population at geographically dispersed clinical trial sites. Phase 1, Phase 2, or Phase 3 testing might not be completed successfully within any specific time period, if at all, with respect to any of our therapeutic candidates. Results from one trial are not necessarily predictive of results from later trials. Furthermore, the FDA or the sponsor may suspend clinical trials at any time on various grounds, including a finding that the subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug candidate has been associated with unexpected serious harm to patients.

The results of the preclinical studies and clinical trials, together with other detailed information, including information on the manufacture and composition of the product, are submitted to the FDA as part of a BLA requesting approval to market the drug candidate for a proposed indication. Under the Prescription Drug User Fee Act, as re-authorized most recently in July 2012, the fees payable to the FDA for reviewing a BLA, as well as annual fees for commercial manufacturing establishments and for approved products, can be substantial. The fee for review of an application that requires clinical data, such as a BLA, for the one year period ending September 30, 2013, is almost $2.0 million, subject to certain limited deferrals, waivers, and reductions that may be available. The fees typically increase each year. Each BLA submitted to the FDA for approval is reviewed for administrative completeness and reviewability

within 60 days following receipt by the FDA of the application. If the BLA is found complete, the FDA will file the BLA, triggering a full review of the application. The FDA may refuse to file any BLA that it deems incomplete or not properly reviewable at the time of submission. The FDA's established goal is to review 90% of priority BLA applications within six months after the application is accepted for filing and 90% of standard BLA applications within 10 months of the acceptance date, whereupon a review decision is to be made. The FDA, however, may not approve a drug candidate within these established goals and its review goals are subject to change from time to time. Further, the outcome of the review, even if generally favorable, may not be an actual approval but a "complete response letter" that describes additional work that must be done before the application can be approved. Before approving a BLA, the FDA may inspect the facility or facilities at which the product is manufactured and will not approve the product unless the facility

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complies with cGMPs. The FDA may deny approval of a BLA if applicable statutory or regulatory criteria are not satisfied, or may require additional testing or information, which can extend the review process. FDA approval of any application may include many delays or never be granted. If a product is approved, the approval may impose limitations on the uses for which the product may be marketed, may require that warning statements be included in the product labeling, may require that additional studies be conducted following approval as a condition of the approval, and may impose restrictions and conditions on product distribution, prescribing, or dispensing in the form of a Risk Evaluation and Mitigation Strategy, or REMS, or otherwise limit the scope of any approval. The FDA must approve a BLA supplement or a new BLA before a product may be marketed for other uses or before certain manufacturing or other changes may be made. Further post-marketing testing and surveillance to monitor the safety or efficacy of a product is required. Also, product approvals may be withdrawn if compliance with regulatory standards is not maintained or if safety or manufacturing problems occur following initial marketing. In addition, new government requirements may be established that could delay or prevent regulatory approval of our therapeutic candidates under development.

As part of the recently-enacted Patient Protection and Affordable Care Act of 2010, under the subtitle of Biologics Price Competition and Innovation Act of 2009, or the BPCI, a statutory pathway has been created for licensure, or approval, of biological products that are biosimilar to, and possibly interchangeable with, earlier biological products licensed under the Public Health Service Act. Also under the BPCI, innovator manufacturers of original reference biological products are granted 12 years of exclusivity before biosimilars can be approved for marketing in the United States. The objectives of the BPCI are conceptually similar to those of the Drug Price Competition and Patent Term Restoration Act of 1984, commonly referred to as the "Hatch-Waxman Act", which established abbreviated pathways for the approval of drug products. The implementation of an abbreviated approval pathway for biological products is under the direction of the FDA and is currently being developed. In late 2010, the FDA held a hearing to receive comments from a broad group of stakeholders regarding the implementation of the BPCI. Since that hearing in 2010, the FDA, in February 2012 and February 2013, has issued several draft guidances for industry related to the BPCI, addressing scientific, quality and procedural issues relevant to an abbreviated application for a biosimilar product. The approval of a biologic product biosimilar to one of our products could have a material adverse impact on our business as it may be significantly less costly to bring to market and may be priced significantly lower than our products.

Both before and after the FDA approves a product, the manufacturer and the holder or holders of the BLA for the product are subject to comprehensive regulatory oversight. For example, quality control and manufacturing procedures must conform, on an ongoing basis, to cGMP requirements, and the FDA periodically inspects manufacturing facilities to assess compliance with cGMPs. Accordingly, manufacturers must continue to spend time, money and effort to maintain cGMP compliance.

Orphan Drug Act

The Orphan Drug Act provides incentives to manufacturers to develop and market drugs for rare diseases and conditions affecting fewer than 200,000 persons in the United States at the time of application for orphan drug designation. Orphan drug designation must be requested before submitting a BLA. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process. If a product that has orphan drug designation subsequently receives the first FDA approval for the disease for which it has such designation, the holder of the approval is entitled to a seven-year exclusive marketing period in the United States for that product except in very limited circumstances. For example, a drug that the FDA considers to be clinically superior to, or different from, another approved orphan drug, even though for the same indication, may also obtain approval in the United States during the seven-year exclusive marketing period. In addition, holders of exclusivity for orphan drugs are expected to assure the availability of sufficient quantities of their orphan drugs to meet the needs of patients. Failure to do so could result in the withdrawal of marketing exclusivity for the drug. Luspatercept has orphan drug designation in the United States for the treatment of ß-thalassemia and for the treatment of MDS. The FDA has granted orphan designation for sotatercept for the treatment of ß-thalassemia.

Legislation similar to the Orphan Drug Act has been enacted outside the U.S., including in the EU. The orphan legislation in the EU is available for therapies addressing chronic debilitating or life-threatening conditions that affect five or fewer out of 10,000 persons or are financially not viable to develop. The market exclusivity period is for ten

years, although that period can be reduced to six years if, at the end of the fifth year, available evidence establishes that the product is sufficiently profitable not to justify maintenance of market exclusivity. The market exclusivity may be extended to 12 years if sponsors complete a pediatric investigation plan agreed upon with the relevant committee of the EMA.

Expedited Review and Approval

The FDA has various programs, including Fast Track, priority review, and accelerated approval, which are intended to expedite or simplify the process for reviewing drugs, and/or provide for the approval of a drug on the basis of a surrogate endpoint. Even if a drug qualifies for one or more of these programs, the FDA may later decide that the drug no longer meets the conditions for qualification or that the time period for FDA review or approval will be shortened. Generally, drugs that are

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eligible for these programs are those for serious or life-threatening conditions, those with the potential to address unmet medical needs and those that offer meaningful benefits over existing treatments. For example, Fast Track is a process designed to facilitate the development and expedite the review of drugs to treat serious or life- threatening diseases or conditions and fill unmet medical needs. Priority review is designed to give drugs that offer major advances in treatment or provide a treatment where no adequate therapy exists an initial review within six months as compared to a standard review time of ten months. Although Fast Track and priority review do not affect the standards for approval, the FDA will attempt to facilitate early and frequent meetings with a sponsor of a Fast Track designated drug and expedite review of the application for a drug designated for priority review. Accelerated approval provides for an earlier approval for a new drug that is intended to treat a serious or life-threatening disease or condition and that fills an unmet medical need based on a surrogate endpoint. A surrogate endpoint is a laboratory measurement or physical sign used as an indirect or substitute measurement representing a clinically meaningful outcome. As a condition of approval, the FDA may require that a sponsor of a drug candidate receiving accelerated approval perform post-marketing clinical trials to confirm the clinically meaning full outcome as predicted by the surrogate marker trial.

In the Food and Drug Administration Safety and Innovation Act, or FDASIA, which was signed into law in July 2012, Congress encouraged the FDA to utilize innovative and flexible approaches to the assessment of products under accelerated approval. The law required the FDA to issue related draft guidance within a year after the law's enactment and also promulgate confirming regulatory changes. In June 2013, the FDA published a draft Guidance for Industry entitled, "Expedited Programs for Serious Conditions—Drugs and Biologics" which provides guidance on FDA programs that are intended to facilitate and expedite development and review of new drugs as well as threshold criteria generally applicable to concluding that a drug is a candidate for these expedited development and review programs. In addition to the Fast Track, accelerated approval and priority review programs discussed above, the FDA also provided guidance on a new program for Breakthrough Therapy designation. A request for Breakthrough Therapy designation should be submitted concurrently with, or as an amendment to an IND. FDA has already granted this designation to over 30 new drugs and recently approved a couple of Breakthrough Therapy designated drugs.

Pediatric Exclusivity and Pediatric Use

Under the Best Pharmaceuticals for Children Act, or BPCA, certain drugs may obtain an additional six months of exclusivity, if the sponsor submits information requested in writing by the FDA, or a Written Request, relating to the use of the active moiety of the drug in children. The FDA may not issue a Written Request for studies on unapproved or approved indications or where it determines that information relating to the use of a drug in a pediatric population, or part of the pediatric population, may not produce health benefits in that population.

We have not received a Written Request for such pediatric studies, although we may ask the FDA to issue a Written Request for such studies in the future. To receive the six-month pediatric market exclusivity, we would have to receive a Written Request from the FDA, conduct the requested studies in accordance with a written agreement with the FDA or, if there is no written agreement, in accordance with commonly accepted scientific principles, and submit reports of the studies. A Written Request may include studies for indications that are not currently in the labeling if the FDA determines that such information will benefit the public health. The FDA will accept the reports upon its determination that the studies were conducted in accordance with and are responsive to the original Written Request or commonly accepted scientific principles, as appropriate, and that the reports comply with the FDA's filing requirements.

In addition, the Pediatric Research Equity Act, or PREA, requires a sponsor to conduct pediatric studies for most drugs and biologicals, for a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration. Under PREA, original NDAs, BLAs and supplements thereto must contain a pediatric assessment unless the sponsor has received a deferral or waiver. The required assessment must include the evaluation of the safety and effectiveness of the product for the claimed indications in all relevant pediatric subpopulations and support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The sponsor or FDA may request a deferral of pediatric studies for some or all of the pediatric subpopulations. A deferral may be granted for several reasons, including a finding that the drug or biologic is ready for approval for use in adults before pediatric studies are complete or that additional safety or effectiveness data needs to be collected before the pediatric studies

begin. After April 2013, the FDA must send a non-compliance letter to any sponsor that fails to submit the required assessment, keep a deferral current or fails to submit a request for approval of a pediatric formulation.

As part of the FDASIA, Congress made a few revisions to BPCA and PREA, which were slated to expire on September 30, 2012, and made both laws permanent.

Reimbursement

In both domestic and foreign markets, sales and reimbursement of any approved products will depend, in part, on the extent to which the costs of such products will be covered by third-party payers, such as government health programs,

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commercial insurance and managed healthcare organizations. These third-party payers are increasingly challenging the prices charged for medical products and services and imposing controls to manage costs. The containment of healthcare costs has become a priority of federal and state governments and the prices of drugs have been a focus in this effort. Governments have shown significant interest in implementing cost-containment programs, including price controls, restrictions on reimbursement and requirements for substitution of generic products. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit our net revenue and results. In addition, there is significant uncertainty regarding the reimbursement status of newly approved healthcare products. We may need to conduct expensive pharmacoeconomic studies in order to demonstrate the cost-effectiveness of our products. If third-party payers do not consider our products to be cost-effective compared to other therapies, the payers may not cover our products after approved as a benefit under their plans or, if they do, the level of payment may not be sufficient to allow us to sell our products on a profitable basis.

Within the United States, if we obtain appropriate approval in the future to market any of our current therapeutic candidates, we may seek approval and coverage for those products under Medicaid, Medicare and the Public Health Service (PHS) pharmaceutical pricing program and also seek to sell the products to federal agencies.

Medicaid is a joint federal and state program that is administered by the states for low income and disabled beneficiaries. Under the Medicaid Drug Rebate Program, manufacturers are required to pay a rebate for each unit of product reimbursed by the state Medicaid programs. The amount of the rebate for each product is set by law and may be subject to an additional discount if certain pricing increases more than inflation.

Medicare is a federal program administered by the federal government that covers individuals age 65 and over as well as those with certain disabilities. Medicare Part D provides coverage to enrolled Medicare patients for self-administered drugs (i.e., drugs that do not need to be administered by a physician). Medicare Part D is administered by private prescription drug plans approved by the U.S. government and each drug plan establishes its own Medicare Part D formulary for prescription drug coverage and pricing, which the drug plan may modify from time-to-time.

Medicare Part B covers most injectable drugs given in an in-patient setting, and some drugs administered by a licensed medical provider in hospital outpatient departments and doctors offices. Medicare Part B is administered by Medicare Administrative Contractors, which generally have the responsibility of making coverage decisions. Subject to certain payment adjustments and limits, Medicare generally pays for Part B covered drugs based on a percentage of manufacturer-reported average sales price.

Drug products are subject to discounted pricing when purchased by federal agencies via the Federal Supply Schedule (FSS). FFS participation is required for a drug product to be covered and paid for by certain federal agencies and for coverage under Medicaid, Medicare Part B and the PHS pharmaceutical pricing program. FSS pricing is negotiated periodically with the Department of Veterans Affairs. FSS pricing is intended to not exceed the price that a manufacturer charges its most-favored non-federal customer for its product. In addition, prices for drugs purchased by the Veterans Administration, Department of Defense (including drugs purchased by military personnel and dependents through the TRICARE retail pharmacy program), Coast Guard, and PHS are subject to a cap on pricing (known as the "federal ceiling price") and may be subject to an additional discount if pricing increases more than inflation.

To maintain coverage of drugs under the Medicaid Drug Rebate Program, manufacturers are required to extend discounts to certain purchasers under the PHS pharmaceutical pricing program. Purchasers eligible for discounts include hospitals that serve a disproportionate share of financially needy patients, community health clinics and other entities that receive health services grants from the PHS.

The American Recovery and Reinvestment Act of 2009 provides funding for the federal government to compare the effectiveness of different treatments for the same illness. A plan for the research will be developed by the Department of Health and Human Services, the Agency for Healthcare Research and Quality and the National Institutes for Health, and periodic reports on the status of the research and related expenditures will be made to Congress. Although the results of the comparative effectiveness studies are not intended to mandate coverage policies for public or private payers, it is not clear what effect, if any, the research will have on the sales of any product, if any such product or the

condition that it is intended to treat is the subject of a study. It is also possible that comparative effectiveness research demonstrating benefits in a competitor's product could adversely affect the sales of any of our approved therapeutic candidates. If third-party payers do not consider our products to be cost-effective compared to other available therapies, they may not cover our products as a benefit under their plans or, if they do, the level of payment may not be sufficient to allow us to sell our products on a profitable basis.

The United States and state governments continue to propose and pass legislation designed to reduce the cost of healthcare. In March 2010, the United States Congress enacted the Patient Protection and Affordable Care Act and the Health Care and Education Reconciliation Act which includes changes to the coverage and payment for drug products under

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government healthcare programs. Adoption of other new legislation at the federal or state level could further limit reimbursement for pharmaceuticals.

Outside the United States, ensuring adequate coverage and payment for our products will face challenges. Pricing of prescription pharmaceuticals is subject to governmental control in many countries. Pricing negotiations with governmental authorities can extend well beyond the receipt of regulatory marketing approval for a product and may require us to conduct a clinical trial that compares the cost effectiveness of our therapeutic candidates or products to other available therapies. The conduct of such a clinical trial could be expensive and result in delays in our commercialization efforts. Third-party payers are challenging the prices charged for medical products and services, and many third-party payers limit reimbursement for newly-approved healthcare products. Recent budgetary pressures in many European Union countries are also causing governments to consider or implement various cost-containment measures, such as price freezes, increased price cuts and rebates. If budget pressures continue, governments may implement additional cost-containment measures. Cost-control initiatives could decrease the price we might establish for products that we may develop or sell, which would result in lower product revenues or royalties payable to us. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products.

Foreign Regulation

In addition to regulations in the United States, we will be subject to a variety of foreign regulations governing clinical trials and commercial sales and distribution of our therapeutic candidates. Whether or not we obtain FDA approval for a therapeutic candidate, we must obtain approval from the comparable regulatory authorities of foreign countries or economic areas, such as the European Union, before we may commence clinical trials or market products in those countries or areas. The approval process and requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary greatly from place to place, and the time may be longer or shorter than that required for FDA approval.

Certain countries outside of the United States have a process that requires the submission of a clinical trial application much like an IND prior to the commencement of human clinical trials. In Europe, for example, a clinical trial application, or CTA, must be submitted to the competent national health authority and to independent ethics committees in each country in which a company intends to conduct clinical trials. Once the CTA is approved in accordance with a country's requirements, clinical trial development may proceed in that country. In all cases, the clinical trials must be conducted in accordance with good clinical practices, or GCPs and other applicable regulatory requirements.

Under European Union regulatory systems, a company may submit marketing authorization applications either under a centralized or decentralized procedure. The centralized procedure is compulsory for medicinal products produced by biotechnology or those medicinal products containing new active substances for specific indications such as the treatment of AIDS, cancer, neurodegenerative disorders, diabetes, viral diseases and designated orphan medicines, and optional for other medicines which are highly innovative. Under the centralized procedure, a marketing application is submitted to the European Medicines Agency where it will be evaluated by the Committee for Medicinal Products for Human Use and a favorable opinion typically results in the grant by the European Commission of a single marketing authorization that is valid for all European Union member states within 67 days of receipt of the opinion. The initial marketing authorization is valid for five years, but once renewed is usually valid for an unlimited period. The decentralized procedure provides for approval by one or more "concerned" member states based on an assessment of an application performed by one member state, known as the "reference" member state. Under the decentralized approval procedure, an applicant submits an application, or dossier, and related materials to the reference member state and concerned member states. The reference member state prepares a draft assessment and drafts of the related materials within 120 days after receipt of a valid application. Within 90 days of receiving the reference member state's assessment report, each concerned member state must decide whether to approve the assessment report and related materials. If a member state does not recognize the marketing authorization, the disputed points are eventually referred to the European Commission, whose decision is binding on all member states.

As in the United States, we may apply for designation of a product as an orphan drug for the treatment of a specific indication in the European Union before the application for marketing authorization is made. Orphan drugs in Europe

enjoy economic and marketing benefits, including up to 10 years of market exclusivity for the approved indication unless another applicant can show that its product is safer, more effective or otherwise clinically superior to the orphan designated product.

Fraud and Abuse Laws

In addition to FDA restrictions on marketing of pharmaceutical products, several other types of state and federal laws have been applied to restrict certain marketing practices in the pharmaceutical industry in recent years. These laws include anti-kickback and false claims statutes.

The federal healthcare program anti-kickback statute prohibits, among other things, knowingly and willfully offering, paying, soliciting or receiving remuneration to induce or in return for purchasing, leasing, ordering or arranging for the

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purchase, lease or order of any healthcare item or service reimbursable under Medicare, Medicaid or other federally financed healthcare programs. This statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on one hand and prescribers, purchasers, and formulary managers on the other. Although there are a number of statutory exemptions and regulatory safe harbors protecting certain common activities from prosecution, the exemptions and safe harbors are drawn narrowly and practices that involve remuneration intended to induce prescribing, purchasing or recommending may be subject to scrutiny if they do not qualify for an exemption or safe harbor. Our practices may not in all cases meet all of the criteria for safe harbor protection from anti-kickback liability.

Federal false claims laws prohibit any person from knowingly presenting, or causing to be presented, a false claim for payment to the federal government, or knowingly making, or causing to be made, a false statement

Additional Regulation

We are also subject to regulation under the Occupational Safety and Health Act, the Environmental Protection Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act and other present and potential federal, state or local regulations. These and other laws govern our use, handling and disposal of various biological and chemical substances used in, and waste generated by our operations. Our research and development involves the controlled use of hazardous materials, chemicals and viruses. Although we believe that our safety procedures for handling and disposing of such materials comply with the standards prescribed by state and federal regulations, the risk of accidental contamination or injury from these materials cannot be completely eliminated. In the event of such an accident, we could be held liable for any damages that result and any such liability could exceed our resources.

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

Manufacturing

We currently manufacture drug substance for our preclinical studies, Phase 1 clinical trials and Phase 2 clinical trials of luspatercept, dalantercept and ACE-083. We manufacture material compliant to U.S. and European cGMP at our 12,000 square foot multi-product facility located at our corporate headquarters in Cambridge, Massachusetts. We have the capabilities to manufacture receptor fusion proteins, monoclonal antibodies, and other therapeutic candidates.

Our manufacturing facility is based on single use, disposable technology to maximize the focus of personnel and other resources on the production process, minimizing the need for cleaning and sterilization while optimizing the efficiency of product change-over. The facility consists of four independent clean rooms totaling 4,000 square feet. The facility includes one 250 liter and one 1,000 liter single use bioreactor and has space for two additional 1,000 liter bioreactors.

Approximately 20 full time employees focus on our process development and manufacturing activities. We believe that our strategic investment in manufacturing capabilities allows us to advance our therapeutic candidates at a more rapid pace and provides us with more portfolio flexibility than if we used a contract manufacturer. The facility produces drug substance in a cost-effective manner while allowing us to retain control over the process and provides an ability to balance the requirements of multiple programs and avoid costly commitments of funds before clinical data are available.

Our manufacturing capabilities encompass the full manufacturing process through quality control and quality assurance. These groups are integrated with our project teams from discovery through development. This structure enables us to efficiently transfer preclinical stage lead molecules into manufacturing. We have designed our manufacturing facility and processes to provide maximum flexibility and rapid change over for the manufacture of different therapeutic candidates. We outsource fill-finish, packaging, labeling, shipping, and distribution.

We manufacture our therapeutic candidates using readily available raw materials and well established manufacturing procedures based on a standardized process modified for each of our therapeutic candidates. We produce our proteins in bioreactors using Chinese hamster ovary cells that have been genetically engineered to produce our specific

therapeutic candidates. We then purify the proteins using industry standard methods, which include affinity chromatography and ultrafiltration operations. Processes developed within our facility have been successfully transferred to commercial facilities based on stainless steel bioreactors. We have conducted comparability characterization on sotatercept between our Phase 2 material and material made at a commercial manufacturer and found them to be comparable.

We believe that we can scale our manufacturing processes to support our clinical development programs and the potential commercialization of our therapeutic candidates. For our early phase therapeutic candidates, we intend to continue to

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manufacture drug substance for preclinical testing and Phase 1 and Phase 2 clinical development at our current facilities. As luspatercept progresses to Phase 3 clinical trials, we intend to transfer the process for Phase 3 production to Celgene, under the terms of our collaboration agreements. We have already successfully transferred the manufacturing process for sotatercept to Celgene, and we expect Celgene will use a contract manufacturer for Phase 3 and commercial supply of sotatercept and luspatercept. We intend to contract with a third party manufacturer for the supply of dalantercept and ACE-083 for Phase 3 clinical trials.

Employees

As of December 31, 2014, we had 83 full-time employees, 65 of whom are involved in research, development or manufacturing, and 21 of whom have Ph.D. or M.D. degrees. We have no collective bargaining agreements with our employees and we have not experienced any work stoppages. We consider our relations with our employees to be good.

Information Available on the Internet

Our Internet address is www.acceleronpharma.com. The contents of our website are not part of this Annual Report on Form 10-K. We make available free of charge through our web site our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to these reports filed or furnished pursuant to Section 12(a) or 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, as soon as reasonably practicable after we electronically file or furnish such materials to the Securities and Exchange Commission. You may read and copy any materials filed with the Securities and Exchange Commission at the Securities and Exchange Commission's Public Reference Room at 100 F Street, NE, Washington, DC 20549. You may obtain information on the operation of the Public Reference Room by calling the Securities and Exchange Commission at 1-800-SEC-0330. This information is also available at www.sec.gov. The reference to these website addresses does not constitute incorporation by reference of the information contained on the websites and should not be considered part of this document.

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Item 1A. Risk Factors

Investing in our common stock involves a high degree of risk. You should carefully consider the risks and uncertainties described below in addition to the other information included or incorporated by reference in this Annual Report on Form 10-K before purchasing our common stock. If any of the following risks actually occurs, our business, financial condition or results of operations would likely suffer, possibly materially. In that case, the trading price of our common stock could fall, and you may lose all or part of the money you paid to buy our common stock. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently believe to be immaterial may also adversely affect our business.

Risks Related to Our Financial Position and Need for Additional Capital

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

We have incurred net losses during most fiscal periods since our inception. As of December 31, 2014, we had an accumulated deficit of $243.6 million. We do not know whether or when we will become profitable. To date, we have not commercialized any products or generated any revenues from the sale of products, and we do not expect to generate any product revenues in the foreseeable future. Our losses have resulted principally from costs incurred in our discovery and development activities.

We anticipate that our expenses will increase in the future as we expand our discovery, research, development, manufacturing and commercialization activities. However, we also anticipate that these increased expenses will be partially offset by milestone payments we expect to receive under our agreements with Celgene and potentially by payments we may receive under new collaboration arrangements we may enter into with third parties for dalantercept, ACE-083 or other therapeutic candidates. If we do not receive the anticipated milestone payments or do not enter into partnerships for dalantercept, ACE-083 or other therapeutic candidates on acceptable terms, our operating losses will substantially increase over the next several years as we execute our plan to expand our discovery, research, development, manufacturing and commercialization activities. There can be no assurance that we will enter into a new collaboration or achieve milestones and, therefore, no assurance our losses will not increase prohibitively in the future.

To become and remain profitable, we or our partners must succeed in developing our therapeutic candidates, obtaining regulatory approval for them, and manufacturing, marketing and selling those products for which we or our partners may obtain regulatory approval. We or they may not succeed in these activities, and we may never generate revenue from product sales that is significant enough to achieve profitability. Even if we achieve profitability in the future, we may not be able to sustain profitability in subsequent periods. Our failure to become or remain profitable would depress our market value and could impair our ability to raise capital, expand our business, discover or develop other therapeutic candidates or continue our operations. A decline in the value of our company could cause you to lose all or part of your investment.

We will require substantial additional financing to achieve our goals, and a failure to obtain this necessary capital when needed could force us to delay, limit, reduce or terminate our product development or commercialization efforts.

As of December 31, 2014, our cash and cash equivalents were $176.5 million. We believe that we will continue to expend substantial resources for the foreseeable future developing dalantercept, ACE-083 and new therapeutic candidates. These expenditures will include costs associated with research and development, potentially acquiring new technologies, conducting preclinical studies and clinical trials, potentially obtaining regulatory approvals and manufacturing products, as well as marketing and selling products approved for sale, if any. In addition, other unanticipated costs may arise. Because the outcome of our planned and anticipated clinical trials is highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the development and commercialization of our therapeutic candidates.

Celgene pays development, manufacturing and commercialization and certain patent costs for sotatercept and luspatercept. Other than those costs, our future capital requirements depend on many factors, including:

- the scope, progress, results and costs of researching and developing our other therapeutic candidates, and conducting preclinical studies and clinical trials;
-

the timing of, and the costs involved in, obtaining regulatory approvals for our other therapeutic candidates if clinical trials are successful;

- the cost of commercialization activities for our other therapeutic candidates, if any of these therapeutic candidates is approved for sale, including marketing, sales and distribution costs;

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- the cost of manufacturing our other therapeutic candidates for clinical trials in preparation for regulatory approval and in preparation for commercialization;

- our ability to establish and maintain strategic partnerships, licensing or other arrangements and the financial terms of such agreements;

- the costs involved in preparing, filing, prosecuting, maintaining, defending and enforcing patent claims, including litigation costs and the outcome of such litigation; and

- the timing, receipt, and amount of sales of, or royalties on, our future products, if any.

Based on our current operating plan, we believe that the net proceeds we received from our initial public offering and the concurrent private placement, and the follow-on public offering, together with receipt of anticipated milestone payments and our existing cash and cash equivalents will be sufficient to fund our projected operating requirements into the second half of 2017. However, our operating plan may change as a result of many factors currently unknown to us, and we may need additional funds sooner than planned. In addition, we may seek additional capital due to favorable market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. Additional funds may not be available when we need them on terms that are acceptable to us, or at all. If adequate funds are not available to us on a timely basis, we may be required to delay, limit, reduce or terminate preclinical studies, clinical trials or other development activities for one or more of our therapeutic candidates or delay, limit, reduce or terminate our establishment of sales and marketing capabilities or other activities that may be necessary to commercialize our therapeutic candidates.

Raising additional capital may cause dilution to our existing stockholders, restrict our operations or require us to relinquish rights to our technologies or therapeutic candidates on unfavorable terms to us.

We may seek additional capital through a variety of means, including through private and public equity offerings and debt financings. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms may include liquidation or other preferences that adversely affect your rights as a stockholder. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take certain actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through strategic partnerships with third parties, we may have to relinquish valuable rights to our technologies or therapeutic candidates, or grant licenses on terms that are not favorable to us. If we are unable to raise additional funds through equity or debt financing when needed, we may be required to delay, limit, reduce or terminate our product development or commercialization efforts for dalantercept, ACE-083 or any therapeutic candidates other than luspatercept or sotatercept, or grant rights to develop and market therapeutic candidates that we would otherwise prefer to develop and market ourselves.

Risks Related to Regulatory Review and Approval of Our Therapeutic Candidates

If we or our partners do not obtain regulatory approval for our current and future therapeutic candidates, our business will be adversely affected.

Our therapeutic candidates will be subject to extensive governmental regulations relating to, among other things, development, clinical trials, manufacturing and commercialization. In order to obtain regulatory approval for the commercial sale of any therapeutic candidates, we or our partners must demonstrate through extensive preclinical studies and clinical trials that the therapeutic candidate is safe and effective for use in each target indication. Clinical testing is expensive, time-consuming and uncertain as to outcome. We or our partners may gain regulatory approval for sotatercept, luspatercept, dalantercept, ACE-083 or any other therapeutic candidate in some but not all of the territories available or some but not all of the target indications or may receive approval with limited labeling or boxed warnings, resulting in limited commercial opportunity for the approved therapeutic candidates, or we or they may never obtain regulatory approval for these therapeutic candidates.

Delays in the commencement, enrollment or completion of clinical trials of our therapeutic candidates could result in increased costs to us as well as a delay or failure in obtaining regulatory approval, or prevent us from commercializing

our therapeutic candidates on a timely basis, or at all.

We cannot guarantee that clinical trials will be conducted as planned or completed on schedule, if at all. A failure of one or more clinical trials can occur at any stage of testing. Events that may prevent successful or timely commencement, enrollment or completion of clinical development include:

- delays by us or our partners in reaching a consensus with regulatory agencies on trial design;

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- delays in reaching agreement on acceptable terms with prospective clinical research organizations, or CROs, and clinical trial sites;
- delays in obtaining required Institutional Review Board, or IRB, approval at each clinical trial site;
- delays in recruiting suitable patients to participate in clinical trials;
- imposition of a clinical hold by regulatory agencies for any reason, including safety or manufacturing concerns or after an inspection of clinical operations or trial sites;
- failure by CROs, other third parties or us or our partners to adhere to clinical trial requirements;
- failure to perform in accordance with the FDA's good clinical practices, or GCP, or applicable regulatory guidelines in other countries;
- delays in the testing, validation, manufacturing and delivery of the therapeutic candidates to the clinical sites;
- delays caused by patients not completing participation in a trial or not returning for post-treatment follow-up;
- clinical trial sites or patients dropping out of a trial;
- occurrence of serious adverse events in clinical trials that are associated with the therapeutic candidates that are viewed to outweigh its potential benefits; or
- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols.

Delays, including delays caused by the above factors, can be costly and could negatively affect our or Celgene's ability to complete a clinical trial. If we or Celgene are not able to successfully complete clinical trials, we will not be able to obtain regulatory approval and will not be able to commercialize our therapeutic candidates.

There is a high risk of clinical failure may occur at any stage of clinical development, and we may never succeed in developing marketable products or generating product revenue.

Our encouraging preclinical and clinical results to date for sotatercept, luspatercept, dalantercept and ACE-083 are not necessarily predictive of the results of our ongoing or future clinical trials. Promising results in preclinical studies of a drug candidate may not be predictive of similar results in humans during clinical trials, and successful results from early clinical trials of a drug candidate may not be replicated in later and larger clinical trials or in clinical trials for different indications. If the results of our or our partners' ongoing or future clinical trials are inconclusive with respect to the efficacy of our therapeutic candidates or if we or they do not meet the clinical endpoints with statistical significance or if there are safety concerns or adverse events associated with our therapeutic candidates, we or our partner may be prevented or delayed in obtaining marketing approval for our therapeutic candidates. In addition, data obtained from trials and studies are susceptible to varying interpretations, and regulators may not interpret our data as favorably as we do, which may delay or prevent regulatory approval. Alternatively, even if we or our partners obtain regulatory approval, that approval may be for indications or patient populations that are not as broad as intended or desired or may require labeling that includes significant use or distribution restrictions or safety warnings. We or our partners may also be required to perform additional or unanticipated clinical trials to obtain approval or be subject to additional post-marketing testing requirements to maintain regulatory approval. In addition, regulatory authorities may withdraw their approval of a product or impose restrictions on its distribution, such as in the form of a risk evaluation and mitigation strategy.

If we or our partners fail to obtain regulatory approval in jurisdictions outside the United States, we and they will not be able to market our products in those jurisdictions.

We and our partners intend to market our therapeutic candidates, if approved, in international markets. Such marketing will require separate regulatory approvals in each market and compliance with numerous and varying regulatory requirements. The approval procedures vary from country-to-country and may require additional testing. Moreover, the time required to obtain approval may differ from that required to obtain FDA approval. In addition, in many countries outside the United States, a therapeutic candidate must be approved for reimbursement before it can be approved for sale in that country. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one foreign regulatory authority does not ensure approval by regulatory authorities in other foreign countries or by the FDA. The foreign

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regulatory approval process may include all of the risks associated with obtaining FDA approval. We or our partners may not obtain foreign regulatory approvals on a timely basis, if at all. We or our partners may not be able to file for regulatory approvals and may not receive necessary approvals to commercialize our products in any market.

We and Celgene regularly request and receive guidance from the FDA and foreign regulators regarding the design or conduct of clinical trials with our therapeutic candidates. This guidance is not binding on these agencies and could change substantially and unpredictably, potentially in a way that makes our clinical trials or our path to regulatory approval longer, more expensive or otherwise more difficult.

Any guidance that we or Celgene receive from the FDA or foreign regulators regarding the design or conduct of our clinical trials is not necessarily indicative of what these regulators will eventually require from us or Celgene to obtain regulatory approval of our therapeutic candidates. These regulators typically caution that any guidance received from them represents their then-current thinking, does not create or confer any rights to us or Celgene, and does not operate to bind the regulator. If later guidance that we or Celgene receive from the FDA or foreign regulators regarding our clinical trial design or conduct is materially different than the current guidance we have received from these regulators, we may need to change our clinical development plans and it may take longer, be more expensive or otherwise be more difficult to obtain FDA or foreign regulatory approval of our therapeutic candidates and our business may be materially harmed.

We undertake no obligation to disclose guidance that we or Celgene may receive from the FDA or foreign regulators. Any guidance from the FDA or foreign regulators that we may disclose publicly speaks only as of the date of such disclosure. We undertake no obligation to update any disclosure we make regarding regulator guidance to reflect additional regulatory guidance received after the date of such disclosure or to reflect the occurrence of unanticipated events that may affect the guidance.

Even if we or our partners receive regulatory approval for our therapeutic candidates, such products will be subject to ongoing regulatory review, which may result in significant additional expense. Additionally, our therapeutic candidates, if approved, could be subject to labeling and other restrictions, and we or our partners may be subject to penalties if we fail to comply with regulatory requirements or experience unanticipated problems with our products.

Any regulatory approvals that we or our partners receive for our therapeutic candidates may also be subject to limitations on the approved indicated uses for which the product may be marketed or to conditions of approval, or contain requirements for potentially costly post-marketing testing, including Phase 4 clinical trials, and surveillance to monitor safety and efficacy. In addition, if the FDA approves any of our therapeutic candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion and recordkeeping for the product will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, registration, as well as continued compliance with current good manufacturing practice, or cGMP, and GCP, for any clinical trials that we or our partners conduct post-approval.

Later discovery of previously unknown problems with an approved therapeutic candidate, including adverse events of unanticipated severity or frequency, or with manufacturing operations or processes, or failure to comply with regulatory requirements, may result in, among other things:

- restrictions on the marketing or manufacturing of the product, withdrawal of the product from the market, or voluntary or mandatory product recalls;
- fines, warning letters, or holds on clinical trials;
- refusal by the FDA to approve pending applications or supplements to approved applications filed by us or our partners, or suspension or revocation of product license approvals;
- product seizure or detention, or refusal to permit the import or export of products; and
- injunctions or the imposition of civil or criminal penalties.

The FDA's policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our therapeutic candidates. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the United States or abroad. If we or our partners are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or not able to maintain regulatory compliance, we or our partners may lose any marketing approval that may have been obtained and we may not achieve or sustain profitability, which would adversely affect our business.

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If we or any of our partners violate the guidelines pertaining to promotion and advertising of any of our therapeutic candidates, if approved, we or they may be subject to disciplinary action by the FDA's Office of Prescription Drug Promotion (OPDP) or other regulatory authorities.

The FDA's Office of Prescription Drug Promotion, or OPDP, is responsible for reviewing prescription drug advertising and promotional labeling to ensure that the information contained in these materials is not false or misleading. There are specific disclosure requirements, and the applicable regulations mandate that advertisements cannot be false or misleading or omit material facts about the product. Prescription drug promotional materials must present a fair balance between the drug's effectiveness and the risks associated with its use. Most warning letters from OPDP cite inadequate disclosure of risk information.

OPDP prioritizes its actions based on the degree of risk to the public health, and often focuses on newly introduced drugs and those associated with significant health risks. There are two types of letters that OPDP typically sends to companies that violate its drug advertising and promotional guidelines: notice of violation letters, or untitled letters, and warning letters. In the case of an untitled letter, OPDP typically alerts the drug company of the violation and issues a directive to refrain from future violations, but does not typically demand other corrective action. A warning letter is typically issued in cases that are more serious or where the company is a repeat offender. Although we have not received any such letters from OPDP, we or any partner may inadvertently violate OPDP's guidelines in the future and be subject to a OPDP untitled letter or warning letter, which may have a negative impact on our business.

Risks Related to Our Reliance on Third Parties

We are dependent on Celgene for the successful development and commercialization of the two most advanced of our four clinical stage therapeutic candidates, sotatercept and luspatercept. If Celgene does not devote sufficient resources to the development of these candidates, is unsuccessful in its efforts, or chooses to terminate its agreements with us, our business will be materially harmed.

We have entered into collaboration agreements with Celgene to develop and commercialize sotatercept and luspatercept. Pursuant to the sotatercept agreement, responsibility for all clinical and other product development activities and for manufacturing sotatercept has been transferred to Celgene. For luspatercept, we are responsible for conducting ongoing Phase 2 clinical trials in MDS, and we are also responsible for manufacturing supplies for Phase 1 and Phase 2 studies. Celgene will be responsible for all clinical development and manufacturing activities after such studies are completed. As of January 1, 2013, Celgene became responsible for paying 100% of worldwide development costs for sotatercept and luspatercept. We will co-promote sotatercept and luspatercept, if approved by the FDA and its counterparties, in North America. Celgene will be responsible for all commercialization costs, including the cost of our promotion activities.

Celgene is obligated to use commercially reasonable efforts to develop and commercialize sotatercept and luspatercept. Celgene may determine that it is commercially reasonable to develop and commercialize only luspatercept or sotatercept and discontinue the development or commercialization of the other therapeutic candidate, or Celgene may determine that it is not commercially reasonable to continue development of one or both of sotatercept and luspatercept. In the event of any such decision, we may be unable to progress the discontinued candidate or candidates ourselves. In addition, under our collaboration agreements, once Celgene takes over development activities of a therapeutic candidate, it may determine the development plan and activities for that therapeutic candidate. We may disagree with Celgene about the development strategy it employs, but we will have no rights to impose our development strategy on Celgene. Similarly, Celgene may decide to seek regulatory approval for, and limit commercialization of, either or both of sotatercept and luspatercept to narrower indications than we would pursue. We would be prevented from developing or commercializing a candidate in an indication that Celgene has chosen not to pursue.

This partnership may not be scientifically or commercially successful due to a number of important factors, including the following:

- Celgene has wide discretion in determining the efforts and resources that it will apply to its partnership with us. The timing and amount of any development milestones, and downstream commercial milestones and royalties that we may receive under such partnership will depend on, among other things, the efforts, allocation of resources and successful

development and commercialization of these therapeutic candidates by Celgene.

Celgene may develop and commercialize, either alone or with others, products that are similar to or competitive with the therapeutic candidates that are the subject of its partnerships with us. For example, Celgene is currently commercializing and/or developing certain of its existing products, lenalidomide and azacitidine, for certain MDS patients for which sotatercept and luspatercept are also being developed.

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- Celgene may terminate its partnership with us without cause and for circumstances outside of our control, which could make it difficult for us to attract new strategic partners or adversely affect how we are perceived in scientific and financial communities.

- Celgene may develop or commercialize our therapeutic candidates in such a way as to elicit litigation that could jeopardize or invalidate our intellectual property rights or expose us to potential liability.

- Celgene may not comply with all applicable regulatory requirements, or may fail to report safety data in accordance with all applicable regulatory requirements.

- If Celgene were to breach its arrangements with us, we may need to enforce our right to terminate the agreement in legal proceedings, which could be costly and cause delay in our ability to receive rights back to the relevant therapeutic candidates. If we were to terminate an agreement with Celgene due to Celgene's breach or Celgene terminated the agreement without cause, the development and commercialization of sotatercept and luspatercept could be delayed, curtailed or terminated because we may not have sufficient financial resources or capabilities to continue development and commercialization of these candidates on our own if we choose not to, or are unable to, enter into a new collaboration for these candidates.

- Celgene may enter into one or more transactions with third parties, including a merger, consolidation, reorganization, sale of substantial assets, sale of substantial stock or other change in control, which could divert the attention of its management and adversely affect Celgene's ability to retain and motivate key personnel who are important to the continued development of the programs under the strategic partnership with us. In addition, the third-party to any such transaction could determine to reprioritize Celgene's development programs such that Celgene ceases to diligently pursue the development of our programs and/or cause the respective partnership with us to terminate.

We and Celgene rely on third parties to conduct preclinical studies and clinical trials for our therapeutic candidates, and if they do not properly and successfully perform their obligations to us, we may not be able to obtain regulatory approvals for our therapeutic candidates.

We design the clinical trials for dalantercept and ACE-083 and will do so for any future unpartnered therapeutic candidates, and we will continue to work with Celgene on trials for sotatercept and luspatercept. However, we and Celgene rely on CROs and other third parties to assist in managing, monitoring and otherwise carrying out many of these trials. We and Celgene compete with many other companies for the resources of these third parties. The third parties on whom we and Celgene rely generally may terminate their engagements at any time, and having to enter into alternative arrangements would delay development and commercialization of our therapeutic candidates.

The FDA and foreign regulatory authorities require compliance with regulations and standards, including GCP, for designing, conducting, monitoring, recording, analyzing, and reporting the results of clinical trials to assure that the data and results are credible and accurate and that the rights, integrity and confidentiality of trial participants are protected. Although we and Celgene rely on third parties to conduct many of our and their clinical trials, we and Celgene are responsible for ensuring that each of these clinical trials is conducted in accordance with its general investigational plan, protocol and other requirements.

If these third parties do not successfully carry out their duties under their agreements, if the quality or accuracy of the data they obtain is compromised due to their failure to adhere to clinical trial protocols or to regulatory requirements, or if they otherwise fail to comply with clinical trial protocols or meet expected deadlines, the clinical trials of our therapeutic candidates may not meet regulatory requirements or may be delayed. If clinical trials do not meet regulatory requirements or if these third parties need to be replaced, preclinical development activities or clinical trials may be extended, delayed, suspended or terminated. If any of these events occur, we or Celgene may not be able to obtain regulatory approval of our therapeutic candidates on a timely basis or at all.

We and Celgene intend to rely on third-party manufacturers to make our therapeutic candidates, and any failure by a third-party manufacturer may delay or impair our and Celgene's ability to complete clinical trials or commercialize

our therapeutic candidates.

Manufacturing biologic drugs is complicated and is tightly regulated by the FDA, the European Medicines Agency, or EMA, and comparable regulatory authorities around the world. We currently manufacture drug substance for our preclinical studies, Phase 1 clinical trials and Phase 2 clinical trials of luspatercept, dalantercept and ACE-083. For Phase 3 and commercial supply of our products that we have not partnered, we expect to use contract manufacturing organizations. Successfully transferring complicated manufacturing techniques to contract manufacturing organizations and scaling up these

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techniques for commercial quantities will be time consuming and we may not be able to achieve such transfer. Moreover, the market for contract manufacturing services for therapeutic candidates is highly cyclical, with periods of relatively abundant capacity alternating with periods in which there is little available capacity. If any need we or Celgene have for contract manufacturing services increases during a period of industry-wide tight capacity, we or Celgene may not be able to access the required capacity on a timely basis or on commercially viable terms.

In addition, we contract with fill & finishing providers with the appropriate expertise, facilities and scale to meet our needs. Failure to maintain cGMP can result in a contractor receiving FDA sanctions, which can impact our and Celgene's contractors' ability to operate or lead to delays in our clinical development programs. We believe that our current fill & finish contractors are operating in accordance with cGMP, but we can give no assurance that FDA or other regulatory agencies will not conclude that a lack of compliance exists. In addition, any delay in contracting for fill & finish services, or failure of the contract manufacturer to perform the services as needed, may delay clinical trials, registration and launches. Any such issues may have a substantial negative effect on our business.

For our two lead products, sotatercept and luspatercept, we rely on our collaboration partner Celgene to produce, or contract for the production of, bulk drug substance and finished drug product for late stage clinical trials and for commercial supplies of any approved candidates. Any failure by Celgene or by third-parties with which Celgene contracts may delay or impair the ability to complete late stage clinical trials or commercialize either or both of sotatercept and luspatercept, if approved.

We produced drug substance for preclinical and Phase 1 and 2 clinical trials for sotatercept and luspatercept. Celgene is now responsible for manufacturing sotatercept and luspatercept for future late-stage clinical trials. Celgene generally does not perform the manufacture of the drug substance or drug product for either sotatercept or luspatercept itself. Celgene has used and may continue to use contract manufacturers for the manufacture of drug substance and drug product for sotatercept and we have no expectation that Celgene plans to perform the manufacture of bulk drug substance or drug product for either sotatercept or luspatercept in the future. However, Celgene would have the right to manufacture sotatercept or luspatercept, itself or through the use of contract manufacturers. We understand that they have entered into manufacturing arrangements for clinical and commercial supplies of sotatercept and luspatercept bulk drug substance with contract manufacturers with considerable biotherapeutics manufacturing experience, including manufacturing monoclonal antibodies through processes similar to those used for sotatercept. If the manufacturer is unwilling or unable to manufacture sufficient quantities of sotatercept and luspatercept to meet clinical or commercial demand, either for technical or business reasons, the development and commercialization of sotatercept and luspatercept may be delayed.

We may not be successful in establishing and maintaining additional strategic partnerships, which could adversely affect our ability to develop and commercialize products, negatively impacting our operating results.

In addition to our current collaborations with Celgene, a part of our strategy is to strategically evaluate and, as deemed appropriate, enter into additional partnerships in the future for our other product candidates when strategically attractive, including potentially with major biotechnology or pharmaceutical companies. We face significant competition in seeking appropriate partners for our therapeutic candidates, and the negotiation process is time-consuming and complex. In order for us to successfully partner our therapeutic candidates, potential partners must view these therapeutic candidates as economically valuable in markets they determine to be attractive in light of the terms that we are seeking and other available products for licensing by other companies. Even if we are successful in our efforts to establish new strategic partnerships, the terms that we agree upon may not be favorable to us, and we may not be able to maintain such strategic partnerships if, for example, development or approval of a therapeutic candidate is delayed or sales of an approved product are disappointing. Any delay in entering into new strategic partnership agreements related to our other therapeutic candidates could delay the development and commercialization of these therapeutic candidates and reduce their competitiveness even if they reach the market.

If we fail to establish and maintain additional strategic partnerships related to our other therapeutic candidates, we will bear all of the risk and costs related to the development of any such therapeutic candidate, and we may need to seek additional financing, hire additional employees and otherwise develop expertise for which we have not budgeted. This could negatively affect the development of any unpartnered therapeutic candidate.

Risks Related to Our Intellectual Property

If we are unable to obtain or protect intellectual property rights related to our therapeutic candidates, we may not be able to compete effectively.

We rely upon a combination of patents, trade secret protection and confidentiality agreements to protect the intellectual property related to our platform technology and therapeutic candidates. The patent position of biotechnology companies is

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generally uncertain because it involves complex legal and factual considerations. The standards applied by the United States Patent and Trademark Office, or USPTO, and foreign patent offices in granting patents are not always applied uniformly or predictably. For example, there is no uniform worldwide policy regarding patentable subject matter or the scope of claims allowable in biotechnology patents. The patent applications that we own or in-license may fail to result in issued patents with claims that cover our therapeutic candidates in the United States or in other countries. There is no assurance that all potentially relevant prior art relating to our patents and patent applications has been found. We may be unaware of prior art that could be used to invalidate an issued patent or prevent our pending patent applications from issuing as patents. Even if patents do successfully issue and even if such patents cover our therapeutic candidates, third parties may challenge their validity, enforceability or scope, which may result in such patents being narrowed or invalidated. Furthermore, even if they are unchallenged, our patents and patent applications may not adequately protect our intellectual property, provide exclusivity for our therapeutic 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.

If patent applications we hold or have in-licensed with respect to our platform or therapeutic candidates fail to issue, if their breadth or strength of protection is threatened, or if they fail to provide meaningful exclusivity for our therapeutic candidates, it could dissuade companies from collaborating with us. Several patent applications covering our therapeutic candidates have been filed recently. We cannot offer any assurances about which, if any, patents will issue, the breadth of any such patents or whether any issued patents will be found invalid and unenforceable or will be threatened by third parties. Any successful challenge to these patents or any other patents owned by or licensed to us could deprive us of rights necessary for the successful commercialization of any therapeutic candidate that we or our partners may develop. Since patent applications in the United States and most other countries are confidential for a period of time after filing, and some remain so until issued, we cannot be certain that we were the first to file any patent application related to a therapeutic candidate. Furthermore, if third parties have filed such patent applications, an interference proceeding in the United States can be initiated by the USPTO or a third party to determine who was the first to invent any of the subject matter covered by the patent claims of our applications. In addition, patents have a limited lifespan. In the United States, the natural expiration of a patent is generally 20 years after it is filed. Various extensions may be available; however, the life of a patent and the protection it affords is limited. If we encounter delays in obtaining regulatory approvals, the period of time during which we could market a therapeutic candidate under patent protection could be reduced. Even if patents covering our therapeutic candidates are obtained, once the patent life has expired for a product, we may be open to competition from biosimilar products.

Any loss of patent protection could have a material adverse impact on our business. We and our partners may be unable to prevent competitors from entering the market with a product that is similar to or the same as our therapeutic candidates. In addition, the royalty we would receive under our collaboration agreements with Celgene for sotatercept and luspatercept would be reduced by 50% if such product ceases to be covered by a valid claim of our patents even if no competitor with a similar product has entered the market.

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

Our commercial success depends in part on us and our partners not infringing the patents and proprietary rights of third parties. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries, including patent infringement lawsuits, interferences, oppositions and inter partes reexamination proceedings before the USPTO and corresponding foreign patent offices. Numerous U.S. and foreign issued patents and pending patent applications owned by third parties exist in the fields in which we and our partners are developing and may develop our therapeutic candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our therapeutic 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 therapeutic candidates, that we failed to identify. For example, applications filed before November 29, 2000 and certain applications filed after that date that will not be filed outside

the United States remain confidential until issued as patents. Except for the preceding exceptions, patent applications in the United States and elsewhere are generally published only after a waiting period of approximately 18 months after the earliest filing. Therefore, patent applications covering our platform technology or our therapeutic candidates could have been filed by others without our knowledge. Additionally, pending patent applications which have been published can, subject to certain limitations, be later amended in a manner that could cover our platform technologies, our therapeutic candidates or the use or manufacture of our therapeutic candidates.

If any third-party patents were held by a court of competent jurisdiction to cover aspects of our materials, formulations, methods of manufacture or methods for treatment, the holders of any such patents would be able to block our ability to develop

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and commercialize the applicable therapeutic candidate until such patent expired or unless we or our partners obtain a license. These licenses may not be available on acceptable terms, if at all. Even if we or our partners were able to obtain a license, the rights may be nonexclusive, which could result in our competitors gaining access to the same intellectual property. Ultimately, we or our partners could be prevented from commercializing a product, or be forced to cease some aspect of our business operations, if, as a result of actual or threatened patent infringement claims, we or our partners are unable to enter into licenses on acceptable terms. If Celgene is required to enter a license agreement with a third party in order to import, develop, manufacture or commercialize sotatercept or luspatercept, the royalty rate and sales milestone payments that we could receive may be reduced by up to 50%. This could harm our business significantly.

Parties making claims against us or our partners may obtain injunctive or other equitable relief, which could effectively block our or our partners' ability to further develop and commercialize one or more of our therapeutic candidates. Defending against claims of patent infringement or misappropriation of trade secrets could be costly and time consuming, regardless of the outcome. Thus, even if we were to ultimately prevail, or to settle at an early stage, such litigation could burden us with substantial unanticipated costs. In addition, litigation or threatened litigation could result in significant demands on the time and attention of our management team, distracting them from the pursuit of other company business. In the event of a successful claim of infringement against us or our partners, 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 face a claim of misappropriation if a third party believes that we inappropriately obtained and used trade secrets of such third party. If we are found to have misappropriated a third party's trade secrets, we may be prevented from further using such trade secrets, limiting our ability to develop our therapeutic candidates, and we may be required to pay damages.

During the course of any patent or other intellectual property litigation, there could be public announcements of the results of hearings, rulings on motions, and other interim proceedings in the litigation. If securities analysts or investors regard these announcements as negative, the perceived value of our therapeutic candidates, programs, or intellectual property could be diminished. Accordingly, the market price of our common stock could decline.

We have in-licensed a portion of our intellectual property, and, if we fail to comply with our obligations under these arrangements, we could lose such intellectual property rights or owe damages to the licensor of such intellectual property.

We are a party to a number of license agreements that are important to our business, and we may enter into additional license agreements in the future. Our discovery and development platform is built, in part, around patents exclusively in-licensed from academic or research institutions. Certain of our in-licensed intellectual property also covers sotatercept and dalantercept. See "Business—Intellectual Property—In-Licenses" for a description of our license agreements with the Beth Israel Deaconess Medical Center, the Ludwig Institute for Cancer Research and the Salk Institute for Biological Studies.

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 there is any conflict, dispute, disagreement or issue of non-performance between us and our licensing partners regarding our rights or obligations under the license agreements, including any such conflict, dispute or disagreement arising from our failure to satisfy payment obligations under any such agreement, we may owe damages, our licensor may have a right to terminate the affected license, and our and our partners' ability to utilize the affected intellectual property in our drug discovery and development efforts, and our ability to enter into collaboration or marketing agreements for an affected therapeutic candidate, may be adversely affected.

Confidentiality agreements with employees and third parties may not prevent unauthorized disclosure of trade secrets and other proprietary information.

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 platform technology and 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, and outside scientific advisors, contractors and collaborators. Although we use reasonable efforts to protect our trade secrets, our employees, consultants, contractors, or outside scientific advisors might intentionally or inadvertently disclose our trade secret information to competitors. In addition, competitors may otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques.

Enforcing a claim that a third party illegally obtained and is using any of our trade secrets is expensive and time consuming, and the outcome is unpredictable. In addition, courts outside the United States sometimes are less willing than U.S. courts to protect trade secrets. Misappropriation or unauthorized disclosure of our trade secrets could impair our competitive position and may have a material adverse effect on our business.

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Risks Related to Commercialization of Our Therapeutic Candidates

Our future commercial success depends upon attaining significant market acceptance of our therapeutic candidates, if approved, among physicians, patients, healthcare payers and acceptance by the operators of major medical providers. Even if we or our partners obtain regulatory approval for sotatercept, luspatercept, dalantercept, ACE-083 or any other therapeutic candidates that we may develop or acquire in the future, the product may not gain market acceptance among physicians, healthcare payers, patients and the medical community. Market acceptance of any approved products depends on a number of factors, including:

- the efficacy and safety of the product, as demonstrated in clinical trials;
- the clinical indications for which the product is approved and the label approved by regulatory authorities for use with the product, including any warnings that may be required on the label;
- acceptance by physicians and patients of the product as a safe and effective treatment;
- decisions by healthcare organizations to utilize the product;
- the cost, safety and efficacy of treatment in relation to alternative treatments;
- the availability of adequate reimbursement and pricing by third party payers and government authorities;
- the continued projected growth of drug markets in our various indications;
- relative convenience and ease of administration;
- the prevalence and severity of adverse side effects; and
- the effectiveness of our, and our partners' sales and marketing efforts.

Market acceptance is critical to our ability to generate significant revenue. Any therapeutic candidate, if approved and commercialized, may be accepted in only limited capacities or not at all. If any approved products are not accepted by the market to the extent that we expect, we may not be able to generate significant revenue and our business would suffer.

Reimbursement may be limited or unavailable in certain market segments for our therapeutic candidates, which could make it difficult for us to sell our products profitably.

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

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

Obtaining coverage and reimbursement approval for a product from a government or other third party payer is a time consuming and costly process that could require us to provide supporting scientific, clinical and cost-effectiveness data for the use of our products to the payer. We or our partners may not be able to provide data sufficient to gain acceptance with respect to coverage and reimbursement. We cannot be sure that coverage or adequate reimbursement will be available for any of our therapeutic candidates. Also, we cannot be sure that reimbursement amounts will not reduce the demand for, or the price of, our products. If reimbursement is not available or is available only to limited levels, we may not be able to commercialize certain of our products. In addition in the United States, third-party payers are increasingly attempting to contain healthcare costs by

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limiting both coverage and the level of reimbursement of new drugs. As a result, significant uncertainty exists as to whether and how much third-party payers will reimburse patients for their use of newly approved drugs, which in turn will put pressure on the pricing of drugs.

Price controls and price pressure may be imposed in foreign and U.S. markets, which may adversely affect our future profitability.

In some countries, particularly member states of the European Union, the pricing of prescription drugs is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after receipt of marketing approval for a product. In addition, there can be considerable pressure by governments and other stakeholders on prices and reimbursement levels, including as part of cost containment measures. Political, economic and regulatory developments may further complicate pricing negotiations, and pricing negotiations may continue after reimbursement has been obtained. Reference pricing used by various European Union member states and parallel distribution, or arbitrage between low-priced and high-priced member states, can further reduce prices. In some countries, we or our partners may be required to conduct a clinical trial or other studies that compare the cost-effectiveness of our therapeutic candidates to other available therapies in order to obtain or maintain reimbursement or pricing approval. Publication of discounts by third-party payers or authorities may lead to further pressure on the prices or reimbursement levels within the country of publication and other countries. If reimbursement of our products is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our business could be adversely affected.

Recent healthcare reform legislation and other changes in the healthcare industry and in healthcare spending may adversely affect our business model.

Our revenue prospects could be affected by changes in healthcare spending and policy in the United States and abroad. We operate in a highly regulated industry and new laws, regulations or judicial decisions, or new interpretations of existing laws, regulations or decisions, related to healthcare availability, the method of delivery or payment for healthcare products and services could negatively impact our business, operations and financial condition. There is significant interest in promoting healthcare reform, as evidenced by the enactment in the United States of the Patient Protection and Affordable Care Act and the Health Care and Education Reconciliation Act in 2010. It is likely that federal and state legislatures within the United States and foreign governments will continue to consider changes to existing healthcare legislation. We cannot predict the reform initiatives that may be adopted in the future or whether initiatives that have been adopted will be repealed or modified. The continuing efforts of the government, insurance companies, managed care organizations and other payers of healthcare services to contain or reduce costs of healthcare may adversely affect:

- the demand for any drug products for which we may obtain regulatory approval;
- our ability to set a price that we believe is fair for our products;
- our ability to obtain coverage and reimbursement approval for a product;
- our ability to generate revenues and achieve or maintain profitability; and
- the level of taxes that we are required to pay.

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

Our future success depends on our or our partners' ability to demonstrate and maintain a competitive advantage with respect to the design, development and commercialization of our therapeutic candidates. Our objective is to design, develop and commercialize new products with superior efficacy, convenience, tolerability and safety. In many cases, the therapeutic candidates that we commercialize with our strategic partners or on our own will compete with existing, market-leading products.

There are products currently approved to treat patients with MDS, including iron chelation therapy, immunomodulators and various chemotherapeutic agents. In addition, erythropoiesis stimulating agents and red blood

cell transfusions are extensively used to treat anemia in MDS. Luspatercept or sotatercept, if approved, will compete with these therapies. In addition, one or more products not currently approved for the treatment of anemia in MDS may in the future be granted marketing approval for the treatment of anemia in MDS or other conditions for which luspatercept or sotatercept might be approved, including Aranesp®, being developed by Amgen, which is in Phase 3 trials. While there are currently no drug products approved for the treatment of anemia in ß-thalassemia, red blood cell transfusions are extensively used and

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luspatercept, if approved, would compete with this therapy. Further, the future approval, in one or more regions, of a biosimilar product to one of our products could create substantial competition and have a material impact on our business.

Sotatercept or luspatercept, if approved for the treatment of chemotherapy-induced anemia or anemia of chronic kidney disease, would compete with erythropoiesis-stimulating agents, such as Epogen® and Aranesp®, marketed by Amgen, and Procrit®, marketed by Johnson & Johnson, that are currently approved for the treatment of chemotherapy-induced anemia or anemia of chronic kidney disease and other therapies in development including oral, small molecule treatments being developed by Astellas Pharma and Fibrogen designed to increase the body's production of erythropoietin.

While we anticipate that dalantercept, if approved for the treatment of cancer, would likely be approved in combination with certain VEGF pathway inhibitors that are currently approved for the treatment of various cancer types, dalantercept would compete with other products, including other angiogenesis inhibitors, approved for the treatment of these cancers.

If ACE-083 is approved for the treatment of neuromuscular disorders or other diseases characterized by a loss of muscle function, it could compete with a variety of other approaches to treating neuromuscular disorders or muscle loss that are currently in clinical trials, including, among others, a monoclonal antibody targeting the activin receptor type IIB being studied to treat pathological muscle loss and weakness, and various myostatin monoclonal antibodies being studied to treat disuse muscle atrophy, cancer-related cachexia, and sarcopenia.

Many of our potential competitors have significantly greater financial, manufacturing, marketing, drug development, technical and human resources than we do. Large pharmaceutical companies, in particular, have extensive experience in clinical testing, obtaining regulatory approvals, recruiting patients and in manufacturing pharmaceutical products. These companies also have significantly greater research and marketing capabilities than we do and may also have products that have been approved or are in late stages of development, and have collaborative arrangements in our target markets with leading companies and research institutions. Established pharmaceutical companies may also invest heavily to accelerate discovery and development of novel compounds or to in-license novel compounds that could make the therapeutic candidates that we develop obsolete. As a result of all of these factors, our competitors may succeed in obtaining patent protection and/or FDA approval or discovering, developing and commercializing therapeutic candidates before we do. In addition, any new product that competes with an approved product must demonstrate compelling advantages in efficacy, convenience, tolerability and safety in order to overcome price competition and to be commercially successful. If we are not able to compete effectively against potential competitors, our business will not grow and our financial condition and operations will suffer.

If our clinical trials fail to demonstrate the safety and efficacy of our therapeutic candidates to the satisfaction of regulatory authorities or do not otherwise produce positive results, we may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our therapeutic candidates.

Undesirable side effects caused by our therapeutic candidates could cause us, Celgene or regulatory authorities to interrupt, delay or halt clinical trials and could result in the denial of regulatory approval by the FDA or other regulatory authorities and potential products liability claims. We and Celgene are currently conducting a number of clinical trials for our clinical stage therapeutic candidates. Serious adverse events deemed to be caused by our therapeutic candidates could have a material adverse effect on the development of our therapeutic candidates and our business as a whole. For a more complete description of the safety profile profile for our therapeutic candidates, see the description of each of our therapeutic candidates in the "Business" section of this Annual Report on Form 10-K. Our understanding of the relationship between our therapeutic candidates and these events may change as we gather more information, and additional unexpected adverse events may occur. There can be no assurance that additional adverse events associated with our therapeutic candidates will not be observed. As is typical in drug development, we have a program of ongoing toxicology studies in animals for our clinical stage therapeutic candidates and cannot provide assurance that the findings from such studies or any ongoing or future clinical trials will not adversely affect our clinical development activities.

Before obtaining marketing approval from regulatory authorities for the sale of our therapeutic candidates, we must complete preclinical development and then conduct extensive clinical trials to demonstrate the safety and efficacy of our therapeutic candidates in humans. Clinical testing is expensive, difficult to design and implement, can take many years to complete and is uncertain as to outcome. A failure of one or more clinical trials can occur at any stage of testing. The outcome of preclinical testing and early clinical trials may not be predictive of the success of later clinical trials, and interim results of a clinical trial do not necessarily predict final results. In addition, preclinical and clinical data are often susceptible to varying interpretations and analyses. Many companies that have believed their therapeutic candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their products.

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

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- regulators or institutional review boards may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;

- we may have delays in reaching or fail to reach agreement on acceptable clinical trial contracts or clinical trial protocols with prospective trial sites;

- clinical trials of our therapeutic candidates may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical trials or abandon product development programs;

- the number of patients required for clinical trials of our therapeutic candidates may be larger than we anticipate; enrollment in these clinical trials may be slower than we anticipate; or participants may drop out of these clinical trials at a higher rate than we anticipate;

- third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all;

- we might have to suspend or terminate clinical trials of our therapeutic candidates for various reasons, including a finding that the participants are being exposed to unacceptable health risks;

- regulators, institutional review boards, or the data safety monitoring board for such trials may require that we or our investigators suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements or a finding that the participants are being exposed to unacceptable health risks;

- the cost of clinical trials of our therapeutic candidates may be greater than we anticipate;

- the supply or quality of our therapeutic candidates or other materials necessary to conduct clinical trials of our therapeutic candidates may be insufficient or inadequate; and

- our therapeutic candidates may have undesirable side effects or other unexpected characteristics, causing us or our investigators, regulators or institutional review boards to suspend or terminate the trials.

If we or our partners are required to conduct additional clinical trials or other testing of our therapeutic candidates beyond those that we currently contemplate, if we or our partners are unable to successfully complete clinical trials of our therapeutic candidates or other testing, if the results of these trials or tests are not positive or are only modestly positive or if we or others identify undesirable side effects caused by our therapeutic candidates either before or after receipt of marketing approval, then a number of potentially significant negative consequences could result, including that we or our partners may:

- be delayed in obtaining or be unable to obtain marketing approval for our therapeutic candidates;

- obtain approval for indications or patient populations that are not as broad as intended or desired;

- be required to provide a medication guide outlining the risks of such side effects for distribution to patients;

- obtain approval with labeling that includes significant use or distribution restrictions or safety warnings, including boxed warnings;

- suffer reputational harm;

- be sued and held liable for harm caused to patients;

- be subject to additional post-marketing testing requirements; or

- have the product removed from the market after obtaining marketing approval.

Product development costs will also increase if we or our partners experience delays in testing or marketing approvals. We do not know whether any clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Significant clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our therapeutic candidates, could allow our competitors to bring products to market before we do, and could

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impair our ability to successfully commercialize our therapeutic candidates, any of which may harm our business and results of operations.

Our results to date do not guarantee that any of our therapeutic candidates will be safe or effective, or receive regulatory approval.

The risk of failure of our current therapeutic candidates is high. To date, the data supporting our clinical development strategy for our therapeutic candidates are derived solely from laboratory and preclinical studies and limited early-to-mid-stage clinical trials. Later clinical trials may not yield data consistent with earlier clinical trials. Similarly, clinical responses seen in patients enrolled at early stages of a clinical trial may not be replicated in patients enrolled in that trial at a later time. In addition, adverse events not observed in early clinical trials may be seen for the first time in later studies, or adverse events observed in a small number of patients in early trials may be seen in a greater number of patients in later studies and have greater statistical significance than previously anticipated. In the event that our clinical trials do not yield data consistent with earlier experience, it may be necessary for us to change our development strategy or abandon development of that therapeutic candidate, either of which could result in delays, additional costs and a decrease in our stock price. It is impossible to predict when or if any of our therapeutic candidates will prove safe or effective in humans or receive regulatory approval. These therapeutic candidates may not demonstrate in patients the chemical and pharmacological properties ascribed to them in laboratory studies or early-to-mid-stage clinical trials, and they may interact with human biological systems or other drugs in unforeseen, ineffective or harmful ways. If we are unable to discover or successfully develop drugs that are safe and effective in humans, we will not have a viable business.

If our manufacturing facility is damaged or destroyed or production at this facility is otherwise interrupted, our business and prospects would be negatively affected.

If the manufacturing facility at our corporate headquarters or the equipment in it is damaged or destroyed, we may not be able to quickly or economically replace our manufacturing capacity or replace it at all. In the event of a temporary or protracted loss of this facility or equipment, we might not be able to transfer manufacturing to a third party. Even if we could transfer manufacturing to a third party, the shift would likely be expensive and time-consuming, particularly since the new facility would need to comply with the necessary regulatory requirements and we would need approval from the FDA and foreign regulators before administering any products manufactured at that facility to patients. Such an event could delay our clinical trials or, if our therapeutic candidates are approved by the FDA or foreign regulators, reduce our product sales.

Risks Related to Our Business and Industry

If we fail to attract and keep senior management and key personnel, we may be unable to successfully develop our therapeutic candidates, conduct our clinical trials and commercialize our therapeutic candidates.

We are highly dependent on members of our senior management, including John L. Knopf, Ph.D., our Chief Executive Officer and President and one of our founders. The loss of the services of any of these persons could impede the achievement of our research, development and commercialization objectives. We do not maintain "key person" insurance for any of our executives or other employees.

Recruiting and retaining qualified scientific, clinical, regulatory, manufacturing, sales and marketing personnel will also be critical to our success. We may not be able to attract and retain these personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us.

Our employees may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements and insider trading.

We are exposed to the risk of employee fraud or other misconduct. Misconduct by employees could include intentional failures to comply with FDA regulations, to provide accurate information to the FDA, to comply with

manufacturing standards we have established, to comply with federal and state healthcare fraud and abuse laws and regulations, to report financial information or data accurately or to disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Employee

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misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of significant fines or other sanctions.

We may encounter difficulties in managing our organizational changes successfully adjusting our operations.

As we seek to advance our therapeutic candidates through clinical trials and commercialization, we will need to expand our development, regulatory, manufacturing, marketing and sales capabilities or contract with third parties to provide these capabilities for us. As our operations expand, we expect that we will need to manage additional relationships with various strategic partners, suppliers and other third parties. Future growth will impose significant added responsibilities on members of management. Our future financial performance and our ability to commercialize our therapeutic candidates and to compete effectively will depend, in part, on our ability to manage any future growth effectively. To that end, we must be able to manage our development efforts and clinical trials effectively and hire, train and integrate additional management, administrative and, if necessary, sales and marketing personnel. We may not be able to accomplish these tasks, and our failure to accomplish any of them could prevent us from successfully growing our company.

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

We face an inherent risk of product liability as a result of the clinical testing of our therapeutic candidates and will face an even greater risk if we commercialize any products. For example, we may be sued if any product we develop allegedly causes injury or is found to be otherwise unsuitable during product testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability, and a breach of warranties. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our therapeutic candidates. Even a successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

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

Failure to obtain and retain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of products we develop. We currently carry product liability insurance covering our clinical trials in the amount of $10.0 million in the aggregate. Although we

maintain such insurance, any claim that may be brought against us could result in a court judgment or settlement in an amount that is not covered, in whole or in part, by our insurance or that is in excess of the limits of our insurance coverage. Our insurance policies also have various exclusions, and we may be subject to a product liability claim for which we have no coverage. We will have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts.

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We could be subject to securities class action litigation.

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

We must comply with environmental laws and regulations, and failure to comply with these laws and regulations could expose us to significant liabilities.

We use hazardous chemicals and radioactive and biological materials in certain aspects of our business and are subject to a variety of federal, state and local laws and regulations governing the use, generation, manufacture, distribution, storage, handling, treatment and disposal of these materials. Although we believe our safety procedures for handling and disposing of these materials and waste products comply with these laws and regulations, we cannot eliminate the risk of accidental injury or contamination from the use, manufacture, distribution, storage, handling, treatment or disposal of hazardous materials. In the event of contamination or injury, or failure to comply with environmental, occupational health and safety and export control laws and regulations, we could be held liable for any resulting damages and any such liability could exceed our assets and resources. We are uninsured for third-party contamination injury.

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

Our results of operations could be adversely affected by general conditions in the global economy and in the global financial markets. The recent global financial crisis caused extreme volatility and disruptions in the capital and credit markets. A severe or prolonged economic downturn could result in a variety of risks to our business, including, weakened demand for our therapeutic candidates and our ability to raise additional capital when needed on acceptable terms, if at all. Weak global economic conditions, especially in Europe, could decrease the number of clinical trial sites available to us and hinder our ability to conduct clinical trials, which would have a material adverse effect on our business and the development of our therapeutic candidates. A weak or declining economy could also strain our suppliers, possibly resulting in supply disruption, or cause our customers to delay making payments for our services. Any of the foregoing could harm our business and we cannot anticipate all of the ways in which the current economic climate and financial market conditions could adversely impact our business.

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

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

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

Despite the implementation of security measures, our internal computer systems and those of our current and any future CROs and other contractors, consultants and collaborators are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. While we have not experienced any such material system failure, accident or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs and our

business operations. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our or our partners' regulatory approval efforts and significantly increase our costs to recover or reproduce the data. Likewise, we rely on third parties to manufacture our therapeutic candidates and conduct clinical trials, and similar events relating to their computer systems could also have a material adverse effect on our business. To the extent that any disruption or security breach were to result in a loss of, or damage to, our or any of our partners' data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the further development and commercialization of our therapeutic candidate could be delayed.

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Risks Related to Our Common Stock

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

Since our initial public offering in September 2013, the price of our common stock as reported on The NASDAQ Global Market has ranged from a low of $16.78 on November 6 and 8, 2013 to a high of $57.89 on January 22, 2014. The market price of shares of our common stock could be subject to wide fluctuations in response to many risk factors listed in this section, and others beyond our control, including:

- results of clinical trials of our therapeutic candidates, including sotatercept, luspatercept, dalantercept and ACE-083;
- the timing of the release of results of our clinical trials that are being conducted by Celgene;
- results of clinical trials of our competitors' products;
- regulatory actions with respect to our products or our competitors' products;
- actual or anticipated fluctuations in our financial condition and operating results;
- publication of research reports by securities analysts about us or our competitors or our industry;
- our failure or the failure of our competitors to meet analysts' projections or guidance that we or our competitors may give to the market;
- additions and departures of key personnel;
- strategic decisions by us or our competitors, such as acquisitions, divestitures, spin-offs, joint ventures, strategic investments or changes in business strategy;
- the passage of legislation or other regulatory developments affecting us or our industry;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- sales of our common stock by us, our insiders or our other stockholders;
- speculation in the press or investment community;
- announcement or expectation of additional financing efforts;
- changes in accounting principles;
- terrorist acts, acts of war or periods of widespread civil unrest;
- natural disasters and other calamities;
- changes in market conditions for biopharmaceutical stocks; and
- changes in general market and economic conditions.

In addition, the stock market has recently experienced significant volatility, particularly with respect to pharmaceutical, biotechnology and other life sciences company stocks. The volatility of pharmaceutical, biotechnology and other life sciences company stocks often does not relate to the operating performance of the companies represented by the stock. As we operate in a single industry, we are especially vulnerable to these factors to the extent that they affect our industry or our products, or to a lesser extent our markets. In the past, securities class action litigation has often been initiated against companies following periods of volatility in their stock price. This type of litigation could result in substantial costs and divert our management's attention and resources, and could also require us to make substantial payments to satisfy judgments or to settle litigation.

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Our management and their and our respective affiliates own a significant percentage of our stock and will be able to exercise significant influence over matters subject to stockholder approval.

As of December 31, 2014, our executive officers, directors and their and our respective affiliates, beneficially owned approximately 33.6% of our common stock, including shares subject to outstanding options and warrants that are exercisable within 60 days after such date. Accordingly, these stockholders will be able to exert a significant degree of influence over our management and affairs and over matters requiring stockholder approval, including the election of our board of directors and approval of significant corporate transactions. This concentration of ownership could have the effect of entrenching our management and/or the board of directors, delaying or preventing a change in our control or otherwise discouraging a potential acquirer from attempting to obtain control of us, which in turn could have a material and adverse effect on the fair market value of our common stock.

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

As of December 31, 2014, we had 32,432,025 shares of common stock outstanding. Sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock. Of these outstanding shares, 9,512,017 are currently held by directors, executive officers and other parties that may be deemed to be their or our affiliates and are available for sale subject to volume limitations, other restrictions under the securities laws and, in some cases, vesting schedules. We also have registered shares of common stock that we may issue under our equity compensation plans. These shares can be freely sold in the public market upon issuance, subject to volume limitations applicable to affiliates.

We continue to incur significant costs as a result of operating as a public company, especially now that we are no longer an "emerging growth company," and our management continues to be required to devote substantial time to compliance initiatives.

As a public company, we incur significant legal, accounting and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act, and rules of the SEC and those of The NASDAQ Global Market, or NASDAQ, have imposed various requirements on public companies including requiring establishment and maintenance of effective disclosure and financial controls. Our management and other personnel devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations have increased and will continue to increase our legal and financial compliance costs and will make some activities more time-consuming and costly. The Sarbanes-Oxley Act requires, among other things, that we maintain effective internal control over financial reporting and disclosure controls and procedures. In particular, we must perform system and process evaluation and testing of our internal control over financial reporting to allow management to report on the effectiveness of our internal control over financial reporting, as required by Section 404 of the Sarbanes-Oxley Act. In addition, due to the loss of our emerging growth company status under the JOBS Act, we are required to have our independent registered public accounting firm attest to the effectiveness of our internal control over financial reporting beginning with this annual report on Form 10-K. Our compliance with Section 404 of the Sarbanes-Oxley Act requires that we incur substantial accounting expense and expend significant management efforts. We currently do not have an internal audit group, and we may need to hire additional accounting and financial staff with appropriate public company experience and technical accounting knowledge. If we are not able to comply with the requirements of Section 404 in a timely manner, or if we or our independent registered public accounting firm identify deficiencies in our internal control 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.

Our ability to successfully implement our business plan and comply with Section 404 requires us to be able to prepare timely and accurate financial statements. We expect that we will need to continue to improve existing, and implement new operational and financial systems, procedures and controls to manage our business effectively. Any delay in the implementation of, or disruption in the transition to, new or enhanced systems, procedures or controls, may cause our operations to suffer and we may be unable to conclude that our internal control over financial reporting is effective and to obtain an unqualified report on internal controls from our auditors as required under Section 404 of the Sarbanes-Oxley Act. This, in turn, could have an adverse impact on trading prices for our common stock, and could

adversely affect our ability to access the capital markets.

If we fail to maintain an effective system of internal control over financial reporting in the future, we may not be able to accurately report our financial condition, results of operations or cash flows, which may adversely affect investor confidence in us and, as a result, the value of our common stock.

The Sarbanes-Oxley Act requires, among other things, that we maintain effective internal controls for financial reporting and disclosure controls and procedures. As of this annual report on Form 10-K for the year ended December 31, 2014, we are

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required, under Section 404 of the Sarbanes-Oxley Act, to furnish a report by management on, among other things, the effectiveness of our internal control over financial reporting. This assessment must include disclosure of any material weaknesses identified by our management in our internal control over financial reporting. A material weakness is a control deficiency, or combination of control deficiencies, in internal control over financial reporting that results in more than a reasonable possibility that a material misstatement of annual or interim financial statements will not be prevented or detected on a timely basis. Section 404 of the Sarbanes-Oxley Act also generally requires an attestation from our independent registered public accounting firm on the effectiveness of our internal control over financial reporting. Now that we no longer qualify as an emerging growth company as defined in the JOBS Act, we are no longer exempted from certain requirements, such as the independent registered public accounting firm attestation. Our compliance with Section 404 requires that we incur substantial accounting expense and expend significant management efforts. We currently do not have an internal audit group, and we may need to hire additional accounting and financial staff with appropriate public company experience and technical accounting knowledge, and compile the system and process documentation necessary to perform the evaluation needed to comply with Section 404. We may not be able to complete our evaluation, testing and any required remediation in a timely fashion. During the evaluation and testing process, if we identify one or more material weaknesses in our internal control over financial reporting, we will be unable to assert that our internal control over financial reporting is effective. We cannot assure you that there will not be material weaknesses or significant deficiencies in our internal control over financial reporting in the future. Any failure to maintain internal control over financial reporting could severely inhibit our ability to accurately report our financial condition, results of operations or cash flows. If we are unable to conclude that our internal control over financial reporting is effective, or if our independent registered public accounting firm determines we have a material weakness or significant deficiency in our internal control over financial reporting, we could lose investor confidence in the accuracy and completeness of our financial reports, the market price of our common stock could decline, and we could be subject to sanctions or investigations by the NASDAQ, the SEC or other regulatory authorities. Failure to remedy any material weakness in our internal control over financial reporting, or to implement or maintain other effective control systems required of public companies, could also restrict our future access to the capital markets.

We do not expect to pay any cash dividends for the foreseeable future.

You should not rely on an investment in our common stock to provide dividend income. We do not anticipate that we will pay any cash dividends to holders of our common stock in the foreseeable future. Instead, we plan to retain any earnings to maintain and expand our operations. In addition, any future debt financing arrangement may contain terms prohibiting or limiting the amount of dividends that may be declared or paid on our common stock. Accordingly, investors must rely on sales of their common stock after price appreciation, which may never occur, as the only way to realize any return on their investment. As a result, investors seeking cash dividends should not purchase our common stock.

Provisions in our restated certificate of incorporation, our amended and restated by-laws and Delaware law may have anti-takeover effects that could discourage an acquisition of us by others, even if an acquisition would be beneficial to our stockholders, and may prevent attempts by our stockholders to replace or remove our current management.

Our 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 restated certificate of incorporation and by-laws include provisions that:

- authorize "blank check" preferred stock, which could be issued by our board of directors without stockholder approval and may contain voting, liquidation, dividend and other rights superior to our common stock;
- create a classified board of directors whose members serve staggered three-year terms;
- specify that special meetings of our stockholders can be called only by our board of directors;
- 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;

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- specify that no stockholder is permitted to cumulate votes at any election of directors;
- expressly authorize our board of directors to modify, alter or repeal our amended and restated by-laws; and
- require supermajority votes of the holders of our common stock to amend specified provisions of our restated certificate of incorporation and amended and restated by-laws

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

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

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

Our restated certificate of incorporation provides that, subject to limited exceptions, the Court of Chancery of the State of Delaware and federal court within the State of Delaware will be exclusive forums for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (3) any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law, our restated certificate of incorporation or our amended and restated by-laws, or (4) any other action asserting a claim against us that is governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our restated certificate of incorporation described above. This choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and employees. Alternatively, if a court were to find these provisions of our restated certificate of incorporation inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could adversely affect our business and financial condition.

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Item 1B. Unresolved Staff Comments

Not applicable.

Item 2. Properties

Our corporate, research and development, manufacturing, and clinical trial operations are located in Cambridge, Massachusetts. We lease approximately 94,500 square feet of office and laboratory space in three adjacent buildings with aggregate monthly net-rent expense of approximately $0.3 million. We have sublet approximately 14,000 square feet of space in one of our leased buildings. Two leases expire in September 2018 and one lease expires in May 2015. We believe our facilities are adequate for our current needs and that suitable additional substitute space would be available if needed.

Item 3. Legal Proceedings

While we are not currently a party to any material legal proceedings, we could become subject to legal proceedings in the ordinary course of business. We do not expect any such potential items to have a significant impact on our financial position.

Item 4. Mine Safety Disclosures

Not applicable.

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PART II

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

Market Information and Stockholders

Our common stock has been listed on The NASDAQ Global Market under the symbol "XLRN" since September 19, 2013. Prior to that, there was no public market for our common stock. The following table sets forth for the periods indicated the high and low sales prices per share of our common stock as reported on The NASDAQ Global Market:

	Common Stock Price			
	2014		2013	
	High	Low	High	Low
First Quarter	$57.89	$33.81	—	—
Second Quarter	$42.24	$28.53	—	—
Third Quarter(1)	$35.00	$23.61	$23.41	$18.50
Fourth Quarter	$48.50	$27.64	$40.02	$16.78

(1) For 2013, represents the period from September 19, 2013, the date on which our common stock first began to trade on The NASDAQ Global Market after the pricing of our initial public offering, through September 30, 2013, the end of our third fiscal quarter.

As of January 31, 2015, there were approximately 125 holders of record of our common stock.

Dividends

We have never declared or paid cash dividends on our common stock. We currently intend to retain all available funds and any future earnings, if any, to fund the development and expansion of our business and we do not anticipate paying any cash dividends in the foreseeable future. In addition, any future debt financing arrangement may contain terms prohibiting or limiting the amount of dividends that may be declared or paid on our common stock. Any future determination to pay dividends will be made at the discretion of our board of directors.

Performance Graph

The following graph shows a comparison from September 19, 2013 through December 31, 2014 of cumulative total return on assumed investment of $100.00 in cash in our common stock, the NASDAQ Composite Index and the NASDAQ Biotechnology Index. Such returns are based on historical results and are not intended to suggest future performance. Data for the NASDAQ Composite Index and the NASDAQ Biotechnology Index assume reinvestment of dividends.

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COMPARISON OF 15 MONTH CUMULATIVE TOTAL RETURN(1)(2)
Among Acceleron Pharma Inc., the NASDAQ Composite Index,
and the NASDAQ Biotechnology Index

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(1) This performance graph shall not be deemed "soliciting material" or to be "filed" with the SEC for purposes of Section 18 of the Securities and Exchange Act of 1934, as amended, or otherwise subject to the liabilities under that Section, and shall not be deemed incorporated by reference into any filing of Acceleron Pharma, Inc. under the Securities Act of 1933, as amended.

(2) $100 invested on September 19, 2013 in stock, or on August 31, 2013 in each index, including reinvestment of dividends.

Recent Sales of Unregistered Securities

We issued the following unregistered securities during the three months ended December 31, 2014:

- In October 2014, we issued 124,135 shares of common stock upon the cashless exercise of warrants to purchase 155,171 shares of common stock.

- In December 2014, we issued 10,284 shares of common stock upon the cashless exercise of warrants to purchase 13,736 shares of common stock, and 13,585 shares of common stock upon the cashless exercise of warrants to purchase 19,108 shares of common stock.

These issuances of shares of our common stock were exempt from registration under the Securities Act pursuant to Rule 506 of Regulation D of the Securities Act and Section 4(a)(2) of the Securities Act.

Use of Proceeds from Initial Public Offering of Common Stock

On September 24, 2013, we completed the initial public offering, or IPO, of our common stock pursuant to a registration statement on Form S-1 (File No. 333-190417), which was declared effective by the SEC on September 18, 2013, and a registration statement filed pursuant to Rule 462(b) of the Securities Act (File No. 333-191245).

As of December 31, 2014, we have used all $86.8 million of the net offering proceeds from our IPO to fund operations, capital expenditures, working capital and other general corporate purposes and for debt repayment. This includes on March 12, 2014, we paid off the remaining principal outstanding under a loan and security agreement with three lenders, dated as of June 7, 2012, or the Loan Agreement, and the deferred fees and early repayment fees, totaling $17.8 million. Except for the early repayment of the Loan Agreement, there has been no material change in our planned use of the balance of the net proceeds

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from the offering described in our final prospectus filed with the SEC on September 19, 2013 pursuant to Rule 424(b) under the Securities Act.

Purchases of Equity Securities by the Issuer or Affiliated Purchasers

None.

Item 6. Selected Financial Data

The information set forth below should be read in conjunction with the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section and with our consolidated financial statements and notes thereto included elsewhere in this Annual Report on Form 10-K. The selected financial data in this section is not intended to replace the consolidated financial statements and are qualified in their entirety by the consolidated financial statements and related notes included elsewhere in this Annual Report on Form 10-K.

The selected consolidated statements of operations data for the years ended December 31, 2014, 2013, and 2012 and the consolidated balance sheet data as of December 31, 2014 and 2013 have been derived from our audited consolidated financial statements included elsewhere in this Annual Report on Form 10-K. We derived the selected consolidated financial data for the years ended December 31, 2011 and as of December 31, 2012 and 2011 from audited financial statements which are not included in this Annual Report on Form 10-K.

Historical results are not necessarily indicative of the results to be expected in future periods.

	Year Ended December 31,			
(in thousands, except per share data)	2014	2013	2012	2011
Consolidated Statements of Operations Data:				
Revenue:				
Collaboration revenue:				
License and milestone	$1,673	$43,948	$9,696	$74,406
Cost-sharing, net	12,959	13,282	5,558	4,760
Contract manufacturing	—	—	—	1,745
Total revenue	14,632	57,230	15,254	80,911
Costs and expenses:				
Research and development	50,897	36,051	35,319	32,713
Litigation Settlement	5,000	—	—	—
General and administrative	14,199	14,227	8,824	8,142
Cost of contract manufacturing revenue	—	—	—	1,500
Total costs and expenses	70,096	50,278	44,143	42,355
(Loss) income from operations	(55,464)	6,952	(28,889)	38,556
Total other expense, net	4,205	(28,850)	(3,693)	(2,290)
Net (loss) income	$(51,259)	$(21,898)	$(32,582)	$36,266
Net (loss) income per share applicable to common stockholders(1)				
Basic	$(1.63)	$(4.15)	$(24.84)	$0.80
Diluted	$(1.63)	$(4.15)	$(24.84)	$0.78
Weighted-average number of common shares used in computing net (loss) income per share applicable to common stockholders				
Basic	31,515	9,407	2,401	2,328
Diluted	31,515	9,407	2,401	2,716

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	As of December 31,			
(in thousands)	2014	2013	2012	2011
Consolidated Balance Sheet Data:				
Cash and cash equivalents	$176,460	$113,163	$39,611	$65,037
Total assets	186,296	123,732	49,212	73,789
Total current liabilities	9,253	18,162	38,802	23,853
Long-term deferred revenue	4,816	5,620	6,760	33,350
Long-term deferred rent	1,818	2,337	2,837	3,335
Long-term notes payable	—	9,048	16,525	—
Warrants to purchase redeemable convertible preferred stock	—	—	1,422	1,046
Warrants to purchase common stock	14,124	30,753	5,229	3,347
Redeemable convertible preferred stock	—	—	268,610	241,549
Total stockholder's equity (deficit)	156,285	57,812	(290,973)	(232,691)

(1) See Note 2 within the notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K for a description of the method used to calculate basic and diluted net (loss) income per common share.

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

The following discussion of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and the notes to those consolidated financial statements included in Item 15 of this Annual Report on Form 10-K. This discussion contains forward-looking statements that involve significant risks and uncertainties. As a result of many factors, such as those set forth under "Risk Factors" and elsewhere in this Annual Report on Form 10-K, our actual results may differ materially from those anticipated in these forward-looking statements. Please also refer to the section under heading "Forward-Looking Statements."

Overview

We are a clinical stage biopharmaceutical company focused on the discovery, development and commercialization of novel therapeutic candidates that are based on the mechanisms that the human body uses to regulate the growth and repair of its cells and tissues. Our research focuses on key natural regulators of cellular growth and repair, particularly the Transforming Growth Factor-Beta (TGF-ß) protein superfamily. We are leaders in discovering and developing therapeutic candidates that regulate cellular growth and repair. By combining our discovery and development expertise, including our proprietary knowledge of the TGF-ß superfamily, and our internal protein engineering and manufacturing capabilities, we have built a highly productive discovery and development platform that has generated innovative therapeutic candidates with novel mechanisms of action. These differentiated therapeutic candidates have the potential to significantly improve clinical outcomes for patients across many fields of medicine, and we have focused our discovery and development efforts on treatments for cancer and rare diseases.

We have four internally discovered therapeutic candidates that are currently in clinical trials. Our lead programs, luspatercept and sotatercept, are partnered with Celgene Corporation (Celgene). During 2015, we and Celgene plan to initiate a Phase 3 clinical trial with luspatercept in patients with ß-thalassemia and a Phase 3 clinical trial with luspatercept or sotatercept in patients with myelodysplastic syndromes (MDS). Luspatercept and sotatercept are designed to promote red blood cell production through a novel mechanism, and we are developing these molecules to treat anemia and associated complications in patients with ß-thalassemia and MDS. The red blood cell complications of ß-thalassemia are generally unresponsive to currently approved drugs, and MDS is a heterogeneous disease for which certain subgroups of patients have no approved drug therapy. Sotatercept is also designed to promote increases in bone mineral density. We and Celgene are developing sotatercept for the treatment of the final stage of chronic kidney disease, end-stage renal disease, a disorder characterized by anemia and a mineral and bone disorder that leads to bone loss and heart disease. The mineral and bone disorder in these patients is not well-managed with current therapies. Our third clinical stage therapeutic candidate, dalantercept, is designed to treat cancers by inhibiting blood vessel formation through a mechanism that is distinct from, and potentially synergistic with, the dominant class of cancer drugs that inhibit blood vessel formation, the vascular endothelial growth factor, or VEGF, pathway inhibitors. We are developing dalantercept primarily for use in combination with VEGF pathway inhibitors to produce better outcomes for cancer patients. Our fourth therapeutic candidate, ACE-083, is designed to promote muscle growth and function in specific, treated muscle groups. In 2014, we initiated a Phase 1 clinical trial with ACE-083 in healthy volunteers, and we expect to initiate one or more Phase 2 clinical trials with ACE-083 in 2015.

We are developing sotatercept and luspatercept through our exclusive worldwide collaborations with Celgene. As of January 1, 2013, Celgene became responsible for paying 100% of worldwide development costs for both programs. We may receive up to an additional $560.0 million of potential development, regulatory and commercial milestone payments and, if these therapeutic candidates are commercialized, we will receive a royalty on net sales in the low-to-mid 20% range. We will co-promote sotatercept and luspatercept, if approved, in North America for which our commercialization costs will be entirely funded by Celgene.

We have not entered into partnerships for dalantercept or ACE-083 and we retain worldwide rights to these programs. As of December 31, 2014, our operations have been funded primarily by $105.1 million in equity investments from venture investors, $219.3 million from public investors, $64.2 million in equity investments from our collaboration partners and $216.8 million in upfront payments, milestones, and net research and development payments from our collaboration partners. We estimate that we have spent approximately $122.3 million on research and development for the three year period from 2012 through 2014.

We expect to continue to incur significant expenses and increasing operating losses over at least the next several years. We expect our expenses will increase substantially in connection with our ongoing activities, as we:

- conduct clinical trials for dalantercept and ACE-083;

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- continue our preclinical studies and potential clinical development efforts of our existing preclinical therapeutic candidates;
- continue research activities for the discovery of new therapeutic candidates;
- manufacture therapeutic candidates for our preclinical studies and clinical trials;
- seek regulatory approval for our therapeutic candidates; and
- operate as a public company.

We will not generate revenue from product sales unless and until we or a partner successfully complete development and obtain regulatory approval for one or more of our therapeutic candidates, which we expect will take a number of years and is subject to significant uncertainty. All current and future development and commercialization costs for sotatercept and luspatercept are paid by Celgene. If we obtain regulatory approval for dalantercept, ACE-083 or any future therapeutic candidate, we expect to incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution to the extent that such costs are not paid by future partners. We will seek to fund our operations through the sale of equity, debt financings or other sources, including potential additional collaborations. However, we may be unable to raise additional funds or enter into such other arrangements when needed on favorable terms, or at all. If we fail to raise capital or enter into such other arrangements as, and when, needed, we may have to significantly delay, scale back or discontinue the development or commercialization of one or more of our therapeutic candidates.

Our ability to generate product revenue and become profitable depends upon our and our partners' ability to successfully commercialize products. We expect to incur losses for the foreseeable future, and we expect these losses to increase as we continue our development of, and seek regulatory approvals for, our therapeutic candidates and potentially begin to commercialize any approved products. For a description of the numerous risks and uncertainties associated with product development, see "Risk Factors".

Financial Operations Overview

Revenue

Collaboration Revenue

We have not generated any revenue from the sale of products. Our revenue to date has been predominantly derived from collaboration revenue, which includes license and milestone revenues and cost sharing revenue, generated through collaboration and license agreements with partners for the development and commercialization of our therapeutic candidates. Cost sharing revenue represents amounts reimbursed by our collaboration partners for expenses incurred by us for research and development activities and, potentially, co-promotion activities, under our collaboration agreements. Cost sharing revenue is recognized in the period that the related activities are performed. To the extent that we reimburse collaborators for costs incurred in connection with activities performed by them, we record these costs as a reduction of cost-sharing revenue.

Contract Manufacturing Revenue

We have generated contract manufacturing revenue in the past but have no current contract manufacturing arrangements. Contract manufacturing revenue consists of revenue received for producing bulk drug substance for third parties other than our partners.

Costs and Expenses

Research and Development Expenses

Research and development expenses consist primarily of costs directly incurred by us for the development of our therapeutic candidates, which include:

- direct employee-related expenses, including salaries, benefits, travel and stock-based compensation expense of our research and development personnel;
-

expenses incurred under agreements with clinical research organizations, or CROs, and investigative sites that will conduct our clinical trials;

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- the cost of acquiring and manufacturing preclinical and clinical study materials and developing manufacturing processes;

- allocated facilities, depreciation, and other expenses, which include rent and maintenance of facilities, insurance and other supplies;

- expenses associated with obtaining and maintaining patents; and

- costs associated with preclinical activities and regulatory compliance.

Research and development costs are expensed as 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 our clinical sites.

We cannot determine with certainty the duration and completion costs of the current or future clinical trials of our therapeutic candidates or if, when, or to what extent we will generate revenues from the commercialization and sale of any of our therapeutic candidates for which we or any partner obtain regulatory approval. We or our partners may never succeed in achieving regulatory approval for any of our therapeutic candidates. The duration, costs and timing of clinical trials and development of our therapeutic candidates will depend on a variety of factors, including:

- the scope, rate of progress, and expense of our ongoing, as well as any additional, clinical trials and other research and development activities;

- future clinical trial results;

- potential changes in government regulation; and

- the timing and receipt of any regulatory approvals.

A change in the outcome of any of these variables with respect to the development of a therapeutic candidate could mean a significant change in the costs and timing associated with the development of that therapeutic candidate. For example, if the FDA, or another regulatory authority were to require us to conduct clinical trials beyond those that we currently anticipate will be required for the completion of the clinical development of therapeutic candidates, or if we experience significant delays in the enrollment in any clinical trials, we could be required to expend significant additional financial resources and time on the completion of clinical development.

From inception through December 31, 2014, we have incurred $338.1 million in research and development expenses. We plan to increase our research and development expenses for the foreseeable future as we continue the development of our TGF-ß platform therapeutic candidates, the discovery and development of preclinical therapeutic candidates, and the development of sotatercept, luspatercept, dalantercept and ACE-083. As of January 1, 2013, expenses associated with sotatercept and luspatercept are reimbursed 100% by Celgene. These reimbursements are recorded as revenue. Of the Phase 2 clinical trials that are underway for sotatercept, luspatercept and dalantercept, we are expensing the costs of seven clinical trials of luspatercept and dalantercept, of which the four for luspatercept are reimbursed by Celgene. We are also expensing the costs of a Phase 1 clinical trial for ACE-083.

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We manage certain activities such as clinical trial operations, manufacture of therapeutic candidates, and preclinical animal toxicology studies through third-party CROs. The only costs we track by each therapeutic candidate are external costs such as services provided to us by CROs, manufacturing of preclinical and clinical drug product, and other outsourced research and development expenses. We do not assign or allocate to individual development programs internal costs such as salaries and benefits, facilities costs, lab supplies and the costs of preclinical research and studies. Our external research and development expenses for sotatercept, luspatercept, dalantercept, ACE-031 (for which development was suspended in April 2013) and ACE-083 (for which development commenced in the fourth quarter of 2013) during the years ended December 31, 2014, 2013 and 2012, are as follows:

	Year ended December 31,		
(in thousands)	2014	2013	2012
Sotatercept(1)	$—	$2	$6
Luspatercept(1)	7,944	5,081	2,885
Dalantercept	7,526	4,636	3,422
ACE-083	5,111	105	—
ACE-031(2)	8	1,023	3,453
Total direct research and development expenses	20,589	10,847	9,766
Other expenses(3)	30,308	25,204	25,553
Total research and development expenses	$50,897	$36,051	$35,319

(1) As of January 1, 2013, expenses associated with sotatercept and luspatercept are reimbursed 100% by Celgene. These reimbursements are recorded as revenue and are presented as cost-sharing, net. In the periods presented, Celgene conducted most of the development activities for sotatercept, and we do not incur and are not reimbursed for expenses related to development activities directly conducted by Celgene.

(2) In April 2013, we and Shire AG, or Shire, determined not to further advance the development of ACE-031, and Shire terminated our collaboration agreement, effective as of June 30, 2013.

(3) Other expenses include unallocated employee and contractor-related expenses, facility expenses, lab supplies and miscellaneous expenses.

Contract Manufacturing Expenses

Contract manufacturing expenses consist primarily of costs incurred for the production of bulk drug substance for third parties other than our partners. The costs generally include employee-related expenses including salary and benefits, direct materials and overhead costs including rent, depreciation, utilities, facility maintenance and insurance. We do not have any current contract manufacturing arrangements.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and related costs for personnel, including stock-based compensation and travel expenses for our employees in executive, operational, finance and human resource functions and other general and administrative expenses including directors' fees and professional fees for accounting and legal services.

Since the completion of our initial public offering in September 2013, we have experienced increased expenses related to audit, legal, regulatory and tax-related services associated with maintaining compliance with exchange listing and Securities and Exchange Commission requirements, director and officer insurance premiums, and investor relations costs associated with being a public company. We anticipate that our general and administrative expenses will increase in the future as we increase our headcount to support our continued research and development and potential commercialization of our therapeutic candidates. Additionally, if and when we believe regulatory approval of a therapeutic candidate appears likely, to the extent that we are undertaking commercialization of such therapeutic candidate ourselves, we anticipate an increase in payroll and related expenses as a result of our preparation for commercial operations.

Other Expense, Net

Other expense, net consists primarily of interest expense from our previous venture debt facility, interest income earned on cash and cash equivalents, and the re-measurement gain or loss associated with the change in the fair value of our preferred stock and common stock warrant liabilities.

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We use the Black-Scholes option pricing model to estimate the fair value of the warrants. We base the estimates in the Black-Scholes option pricing model, in part, on subjective assumptions, including stock price volatility, risk-free interest rate, dividend yield, and the fair value of the preferred stock or common stock underlying the warrants.

Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial condition and results of operations are based on our consolidated financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles. The preparation of these consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, and expenses and the disclosure of contingent assets and liabilities in our consolidated financial statements. On an ongoing basis, we evaluate our estimates and judgments, including those related to revenue recognition, accrued expenses and stock-based compensation. We also utilize significant estimates and assumptions in determining the fair value of our common stock and the fair value of our liability-classified warrants to purchase preferred stock and common stock. We base our estimates on historical experience, known trends and events, and various other factors that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in more detail in the notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K, we believe the following accounting policies to be most critical to the judgments and estimates used in the preparation of our consolidated financial statements.

Revenue Recognition

We have primarily generated revenue through collaboration arrangements with strategic partners for the development and commercialization of our therapeutic candidates.

We recognize revenue in accordance with Accounting Standards Codification (ASC) Topic 605, Revenue Recognition. Accordingly, revenue is recognized for each unit of accounting when all of the following criteria are met: (1) persuasive evidence of an arrangement exists; (2) delivery has occurred or services have been rendered; (3) the fee is fixed or determinable; and (4) collectability is reasonably assured.

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

Under collaboration agreements, we may receive payments for non-refundable up-front fees, milestone payments upon achieving significant development events, research and development reimbursements and royalties on future product sales. These payments are received in connection with the deliverables contained in the arrangements which may include (1) licenses, or options to obtain licenses, to our technology, (2) research and development activities performed for the collaboration partner, (3) participation on joint committees and (4) manufacturing clinical or preclinical material.

Effective January 1, 2011, we adopted Accounting Standards Update (ASU) No. 2009-13, Multiple-Deliverable Revenue Arrangements, which amends ASC Topic 605-25, Revenue Recognition—Multiple Element Arrangements. This guidance applies to new arrangements as well as existing agreements that are significantly modified after January 1, 2011.

The application of the multiple element guidance requires subjective determinations, and requires management to make judgments about the individual deliverables, and whether such deliverables are separable from the other aspects of the contractual relationship. Deliverables are considered separate units of accounting provided that: (1) the delivered item(s) has value to the customer on a stand-alone basis and (2) if the arrangement includes a general right of return relative to the delivered item(s), delivery or performance of the undelivered item(s) is considered probable and substantially in our control. In determining the units of accounting, management evaluates certain criteria, including whether the deliverables have stand-alone value, based on the consideration of the relevant facts and circumstances for each arrangement, such as the research, manufacturing and commercialization capabilities of the

collaboration partner and the availability of the associated expertise in the general marketplace. In addition, we consider whether the collaboration partner can use the other deliverable(s) for their intended purpose without the receipt of the remaining element(s), whether the value of the deliverable is dependent on the undelivered item(s), and whether there are other vendors that can provide the undelivered element(s).

Arrangement consideration that is fixed or determinable is allocated among the separate units of accounting using the relative selling price method, and the applicable revenue recognition criteria, as described above, are applied to each of the separate units of accounting in determining the appropriate period or pattern of recognition. We determine the estimated selling

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price for deliverables within each agreement using vendor-specific objective evidence (VSOE) of selling price, if available, third-party evidence (TPE) of selling price if VSOE is not available, or management's best estimate of selling price (BESP) if neither VSOE nor TPE is available. Subsequent to the adoption of ASU 2009-13, we typically use BESP to estimate the selling price of the deliverables. Determining the BESP for a unit of accounting requires significant judgment. In developing the BESP for a unit of accounting, we consider applicable market conditions and relevant entity-specific factors, including factors that were contemplated in negotiating the agreement with the customer and estimated costs. We validate the BESP for units of accounting by evaluating whether changes in the key assumptions used to determine the BESP will have a significant effect on the allocation of arrangement consideration between multiple units of accounting.

Our agreements may contain options which provide the collaboration partner the right to obtain additional licenses. Options are considered substantive if, at the inception of the arrangement, we are at risk as to whether the collaboration partner will choose to exercise the option. Factors that we consider in evaluating whether an option is substantive include the overall objective of the arrangement, the benefit the collaborator might obtain from the arrangement without exercising the option, the cost to exercise the option and the likelihood that the option will be exercised. For arrangements under which an option is considered substantive, we do not consider the item underlying the option to be a deliverable at the inception of the arrangement and the associated option fees are not included in allocable arrangement consideration, assuming the option is not priced at a significant and incremental discount. Conversely, for arrangements under which an option is not considered substantive or if an option is priced at a significant and incremental discount, we would consider the item underlying the option to be a deliverable at the inception of the arrangement and a corresponding amount would be included in allocable arrangement consideration.

We typically receive up-front, non-refundable payments when licensing our intellectual property in conjunction with a research and development agreement. When we believe the license to our intellectual property has stand-alone value, we generally recognize revenue attributed to the license upon delivery. When we believe the license to our intellectual property does not have stand-alone value from the other deliverables to be provided in the arrangement, we generally recognize revenue attributed to the license on a straight-line basis over our contractual or estimated performance period, which is typically the term of our research and development or manufacturing obligations. We continually evaluate these periods, and will adjust the period of revenue recognition if circumstances change.

Research and development funding is recognized as revenue in the period that the related services are performed. When we act as the principal under our collaboration arrangements, we record payments received for the reimbursement of research and development costs as cost-sharing revenue. To the extent that we reimburse the collaborator for costs incurred, we record these costs as a reduction of cost-sharing revenue.

We periodically review the basis for our estimates, and we may change the estimates if circumstances change. These changes can significantly increase or decrease the amount of revenue recognized. As we apply our policy to our collaboration arrangements we make judgments which affected the pattern of revenue recognition. For instance, in our arrangement with Celgene, we are obligated to provide research and development services. We are recognizing revenue related to these research and development services over the estimated period of our performance, which was initially estimated to end in December 2014. The Company re-assessed the duration of its deliverables under the collaboration agreement and now estimates the new term to end in the first quarter of 2016, the expected completion date of the proof-of-concept trials for luspatercept under the Celgene collaboration. Another instance relates to our arrangement with Shire AG, where in April 2013, we and Shire determined not to further advance the development of ACE-031 or back-up compounds and Shire terminated our collaboration agreement effective as of June 30, 2013.

In addition to up-front payments and research and development funding, we may also be entitled to milestone payments that are contingent upon achievement of a predefined objective. At the inception of each arrangement that includes milestone payments, we evaluate whether the milestone is substantive and at-risk. This evaluation includes an assessment of whether (1) the consideration is commensurate with either the entity's performance to achieve the milestone, or the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting at least in part from the entity's performance to achieve the milestone, (2) the consideration relates solely to past performance, and (3) the consideration is reasonable relative to all of the deliverables and payment terms within the arrangement. We evaluate factors such as the scientific, regulatory, commercial and other risks that must be overcome to achieve

the respective milestone, the level of effort and investment required to achieve the respective milestone, and whether the milestone consideration is reasonable relative to all deliverables and payment terms in the arrangement in making this assessment. On the milestone achievement date, assuming all other revenue recognition criteria are met and the milestone is deemed substantive and at-risk, we recognize the payment as license and milestone revenue. For milestones that are not deemed substantive and at-risk, where payment is reasonably assured, we recognize the milestone payment over the remaining service period.

Sales and commercial milestones and royalties will be recognized when and if earned, provided collectability is reasonably assured.

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Clinical Trial Accruals and Related Expenses

We accrue and expense costs for clinical trial activities performed by third parties, including CROs and clinical investigators, based upon estimates made as of the reporting date of the work completed over the life of the individual study in accordance with agreements established with CROs and clinical trial sites. Some CROs invoice us on a monthly basis, while others invoice upon achievement of milestones and the expense is recorded as services are rendered. We determine the estimates of clinical activities incurred at the end of each reporting period through discussion with internal personnel and outside service providers as to the progress or stage of completion of trials or services, as of the end of each reporting period, pursuant to contracts with numerous clinical trial centers and CROs and the agreed upon fee to be paid for such services. The significant factors considered in estimating accruals include the number of patients enrolled and the percentage of work completed to date. Costs of setting up clinical trial sites for participation in the trials that are paid for in advance are expensed over the estimated set-up period. While the set-up periods vary from one arrangement to another, such set-up periods generally take approximately three months. Set-up activities include clinical site identification, institutional review board, or IRB, submissions, regulatory submissions, clinical investigator kick-off meetings and pre-study site visits. Clinical trial site costs related to patient enrollments are accrued as patients are entered into the trial.

Stock-Based Compensation

We account for our stock-based awards in accordance with ASC Topic 718, Compensation—Stock Compensation, or ASC 718, which requires all stock-based payments to employees, including grants of employee stock options and modifications to existing stock options, to be recognized in the statements of operations and comprehensive income (loss) based on their fair values. We recognize the compensation cost of awards subject to service-based vesting conditions over the requisite service period, which is generally equal to the vesting term. For awards subject to both performance and service-based vesting conditions, we recognize compensation cost using an accelerated recognition method when it is probable that the performance condition will be achieved. We account for stock-based awards to non-employees using the fair value method. Stock options granted to non-employees are subject to periodic revaluation over their vesting terms and stock-based compensation cost is recognized using an accelerated recognition method.

We estimate the fair value of our stock-based awards to employees and non-employees using the Black-Scholes option pricing model, which requires the input of highly subjective assumptions, including (1) the expected volatility of our stock, (2) the expected term of the award, (3) the risk-free interest rate and (4) expected dividends. Due to the lack of a public market for our common stock prior to the completion of our initial public offering in September 2013, and resulting lack of company-specific historical and implied volatility data, we have based our estimate of expected volatility on the historical volatility of a group of similar companies that are publicly traded. For these analyses, we have selected companies with characteristics that we believe are comparable to ours, 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. We compute the historical volatility data using the daily closing prices for the selected companies' shares during the equivalent period as the calculated expected term of our 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. We have estimated the expected life of our employee stock options using the "simplified" method, whereby, the expected life equals the average of the vesting term and the original contractual term of the option. The risk-free interest rates for periods within the expected life of the option are based on the U.S. Treasury yield curve in effect during the period the options were granted.

We also estimate forfeitures at the time of grant, and revise those estimates in subsequent periods if actual forfeitures differ from estimates. We use historical data to estimate pre-vesting option forfeitures to the extent that actual forfeitures differ from our estimates, the difference is recorded as a cumulative adjustment in the period the estimates were revised. Stock-based compensation expense recognized in the consolidated financial statements is based on awards that are ultimately expected to vest. For the years ended December 31, 2014, 2013 and 2012, we used a forfeiture rate of 4%, 4%, and 5%, respectively.

Stock-based compensation totaled approximately $4.8 million, $2.2 million, and $1.2 million for the years ended December 31, 2014, 2013 and 2012, respectively. We expect the impact of our stock-based compensation expense for

stock-based awards granted to employees and non-employees to grow in future periods due to the potential increases in the value of our common stock and headcount.

Warrants to Purchase Preferred Stock and Common Stock

As of December 31, 2014, we had warrants outstanding to purchase 422,104 shares of common stock, of which warrants to purchase 409,470 shares of our common stock contain a provision requiring an adjustment to the number of shares in the event we issue common stock, or securities convertible into or exercisable for common stock, at a price per share lower than the warrant exercise price. The anti-dilution feature requires the warrants to be classified as liabilities and measured at fair value, with changes in fair value recognized as a component of other income (expense). The fair value of the warrants to

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purchase common stock on the date of issuance and on each re-measurement date for those warrants to purchase common stock classified as liabilities was estimated using either the Monte Carlo simulation framework, which incorporates future financing events over the remaining life of the warrants to purchase common stock, or for certain re-measurement dates including December 31, 2013 and 2014, due to the warrants being deeply in the money, the Black-Scholes option pricing model was used. At each reporting period the company evaluates the best valuation methodology. Any modifications to the warrant liabilities are recorded in earnings during the period of the modification. The significant assumptions used in estimating the fair value of our warrant liabilities include the exercise price, volatility of the stock underlying the warrant, risk-free interest rate, estimated fair value of the stock underlying the warrant, and the estimated life of the warrant. The common stock warrant liability was $14.1 million, $30.8 million, and $5.2 million as of December 31, 2014, 2013 and 2012, respectively. At the end of each reporting period, the Company remeasured the fair value of the outstanding warrants, using current assumptions, resulting in a (decrease) increase in fair value of $(5.0) million, $26.9 million, and $1.9 million respectively, which was recorded in other income (expense), net in the accompanying consolidated statements of operations and comprehensive loss for the years ended December 31, 2014, 2013 and 2012. The changes in value of the warrant liability were primarily due to fluctuations in the market price of our common stock.

Additionally, prior to the completion of our initial public offering in September 2013, we had warrants outstanding to purchase shares of Series B, Series C-1 and Series D-1 preferred stock. Freestanding warrants that are related to the purchase of redeemable preferred stock were classified as liabilities and recorded at fair value regardless of the timing of the redemption feature or the redemption price or the likelihood of redemption. The warrants were subject to re-measurement at each balance sheet date and any change in fair value was recognized as a component of other income (expense), net. We measured the fair value of our warrants to purchase preferred stock using a Black-Scholes option pricing model. In connection with the closing of our initial public offering on September 24, 2013, the outstanding warrants to purchase Series B Preferred Stock, Series C-1 Preferred Stock, and Series D-1 Preferred Stock were converted into warrants to purchase common stock and are now classified as a component of equity and are no longer subject to remeasurement. The exercise prices for each of these warrants remained unchanged.

Results of Operations

Comparison of the Years Ended December 31, 2014 and 2013

(in thousands)	Year Ended December 31, 2014	2013	Increase (Decrease)
Revenue:			
Collaboration revenue:			
License and milestone	$1,673	$43,948	$(42,275)
Cost-sharing, net	12,959	13,282	(323)
Total revenue	14,632	57,230	(42,598)
Costs and expenses:			
Research and development	50,897	36,051	14,846
Litigation settlement	5,000	—	5,000
General and administrative	14,199	14,227	(28)
Total costs and expenses	70,096	50,278	19,818
(Loss) income from operations	(55,464)	6,952	(62,416)
Other income (expense), net	4,205	(28,850)	33,055
Net loss	$(51,259)	$(21,898)	$(29,361)

Revenue. We recognized revenue of $14.6 million in the year ended December 31, 2014, compared to $57.2 million in year ended December 31, 2013. The $42.6 million decrease was primarily due to the $17.0 million in milestone payments received during 2013 in connection with our Celgene collaboration for the first patient dosed in a Phase 2 trial in luspatercept and initiation of a Phase 2b study of sotatercept in end-stage renal disease patients, and recognizing $24.3 million of deferred revenue related to Shire. Shire ended our collaboration as of June 30, 2013 and

there is no Shire related revenue during 2014. Celgene deferred revenue also decreased $1.0 million during 2014 as we complete our deliverables under the collaboration agreement. Net cost sharing revenue decreased $0.3 million due to an increase in Celgene cost sharing revenue of $0.3 million offset by a $0.6 million decrease in net cost-sharing revenue from Shire.

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The following table shows revenue from all sources for the years presented.

(in thousands)	Year Ended December 31, 2014	2013	Increase (Decrease)
Collaboration revenue:			
Celgene:			
License and milestone	$1,673	$19,626	$(17,953)
Cost-sharing, net	12,959	12,658	301
Total Celgene	14,632	32,284	(17,652)
Shire:			
License and milestone	—	24,322	(24,322)
Cost-sharing, net	—	624	(624)
Total Shire	—	24,946	(24,946)
Total collaboration revenue	14,632	57,230	(42,598)
Total revenue	$14,632	$57,230	$(42,598)

Research and Development Expenses. Research and development expenses were $50.9 million in the year ended December 31, 2014, compared to $36.1 million in the year ended December 31, 2013. This $14.8 million increase was primarily due to an increase in expenses associated with clinical activity totaling $9.6 million, higher personnel related expenses of $3.9 million, higher legal expenses of $1.0 million and a $0.7 million increase in miscellaneous research and development expenses primarily due to an antibody collaboration agreement, executed in 2014, offset by a reduction of $0.5 million because of a royalty payment due to the Salk Institute for a milestone achieved during 2013.

Litigation Settlement. Litigation settlements in the year ended December 31, 2014 were $5.0 million compared to zero in the same period in 2013. This increase was due to the settlement of litigation with the Salk Institute in July 2014.

General and Administrative Expenses. General and administrative expenses were $14.2 million in the year ended December 31, 2014, compared to $14.2 million in the year ended December 31, 2013. During 2014, increases of $0.7 million for higher personnel related expenses and $2.0 million related to higher professional fees and insurance were primarily offset by a decrease of $2.8 million for legal expenses due to the settlement of ongoing litigation.

Other Income (Expense), Net. Other income, net was $4.2 million in the year ended December 31, 2014, compared to expense of $28.9 million in the year ended December 31, 2013. This $33.1 million increase was primarily due to a $30.7 million difference in the effect of marking the common stock warrant liability to market in each period. The additional increase was a $1.2 million decrease in interest expense because the outstanding long term debt was retired during March 2014 and an increase of $1.3 million for the effect of marking preferred stock warrants to market prior to their conversion during the initial public offering.

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Comparison of the Years Ended December 31, 2013 and 2012

(in thousands)	Year Ended December 31, 2013	2012	Increase (Decrease)
Revenue:			
Collaboration revenue:			
License and milestone	$43,948	$9,696	$34,252
Cost-sharing, net	13,282	5,558	7,724
Total revenue	57,230	15,254	41,976
Costs and expenses:			
Research and development	36,051	35,319	732
General and administrative	14,227	8,824	5,403
Total costs and expenses	50,278	44,143	6,135
Income (loss) from operations	6,952	(28,889)	35,841
Other expense, net	(28,850)	(3,693)	(25,157)
Net loss	$(21,898)	$(32,582)	$10,684

Revenue. We recognized revenue of $57.2 million in the year ended December 31, 2013, compared to $15.3 million in year ended December 31, 2012. The $42.0 million increase was primarily due to the $10.0 million milestone payment received in connection with our Celgene collaboration for the first patient dosed in a Phase 2 trial in luspatercept, $7.0 million milestone payment received in connection with our Celgene collaboration for initiation of a Phase 2b study of sotatercept in end-stage renal disease patients, and recognizing an additional $16.7 million of deferred revenue because Shire ended our collaboration as of June 30, 2013. The remaining increase of $8.3 million was primarily due to an increase in net cost-sharing revenue from Celgene of $9.8 million due to Celgene assuming 100% of the costs of development for these therapeutic candidates as of January 1, 2013, and recognition of $0.6 million deferred revenue from Celgene, offset by a decrease in net cost-sharing revenue from Shire of $2.1 million due to the end of the collaboration as of June 30, 2013.

The following table shows revenue from all sources for the years presented.

(in thousands)	Year Ended December 31, 2013	2012	Increase (Decrease)
Collaboration revenue:			
Celgene:			
License and milestone	$19,626	$2,035	$17,591
Cost-sharing, net	12,658	2,879	9,779
Total Celgene	32,284	4,914	27,370
Shire:			
License and milestone	24,322	7,661	16,661
Cost-sharing, net	624	2,679	(2,055)
Total Shire	24,946	10,340	14,606
Total collaboration revenue	57,230	15,254	41,976
Total revenue	$57,230	$15,254	$41,976

Research and Development Expenses. Research and development expenses were $36.1 million in the year ended December 31, 2013, compared to $35.3 million in the year ended December 31, 2012. This $0.7 million increase was primarily due to an increase in expenses associated with clinical activity totaling $3.1 million, an increase in expenses associated with clinical drug supply of $1.0 million, higher spend for in-licensing of $0.3 million, higher compensation related expense of $0.3 million, and a royalty owed to the Salk Institute of $0.5 million, partially offset by a reduction in preclinical animal studies totaling $3.0 million, legal spend for patent related matters of $0.8 million, and depreciation of $0.4 million.

General and Administrative Expenses. General and administrative expenses were $14.2 million in the year ended December 31, 2013, compared to $8.8 million in the year ended December 31, 2012. This $5.4 million increase was primarily

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related to higher professional fees for legal services in connection with our litigation with the Salk Institute and for increased professional fees and financial consulting services in connection with business development activities totaling $3.3 million, $0.2 million for higher insurance expenses, and higher total compensation expenses totaling $1.8 million.

Other Expense, Net. Other expense, net was $28.9 million in the year ended December 31, 2013, compared to $3.7 million in the year ended December 31, 2012. This $25.2 million increase was primarily due to higher expense associated with the increase in fair value of the liability for warrants of $24.5 million and an increase in interest expense of $0.6 million due to a higher average outstanding debt balance in the year ended December 31, 2013.

Liquidity and Capital Resources

We have incurred losses and cumulative negative cash flows from operations since our inception in June 2003, and as of December 31, 2014, we had an accumulated deficit of $(243.6) million. We anticipate that we will continue to incur losses for at least the next several years. We expect that our research and development and general and administrative expenses will continue to increase and, as a result, we will need additional capital to fund our operations, which we may raise through a combination of the sale of equity, debt financings or other sources, including potential additional collaborations.

As of December 31, 2014, our operations have been primarily funded by $105.1 million in equity investments from venture investors prior to the IPO, $219.3 million from public investors, $64.2 million in equity investments from our partners and $216.8 million in upfront payments, milestones, and net research and development payments from our strategic partners.

On September 24, 2013, we completed the sale of 6,417,000 shares of our common stock, including 837,000 shares of common stock sold pursuant to the underwriters' full exercise of their option to purchase additional shares at a public offering price of $15.00 per share, resulting in net proceeds to us of $86.8 million, after deducting underwriting discounts and offering expenses. Also in September 2013, we completed a private placement of $10.0 million of our common stock at a price of $15.00 per share.

On January 28, 2014, we completed the sale of 2,760,000 shares of our common stock, including 360,000 shares of common stock sold pursuant to the underwriters' full exercise of their option to purchase additional shares at a public offering price of $50.00 per share, resulting in net proceeds to us of $129.2 million, after deducting underwriting discounts and offering expenses.

We entered into a new venture debt facility on June 7, 2012 and, as of December 31, 2013 we had $16.9 million in venture debt outstanding. After an interest-only period, we began paying down principal on the debt facility in July 2013. Interest accrued at a rate of 8.5% per annum and was payable monthly. The debt facility also included a closing fee of $0.2 million and was also subject to an additional deferred payment of $1.2 million which is due at the time of the final payment. We were amortizing the cost over the 42 months of the loan resulting in an effective interest rate of approximately 11.8%. The debt facility was secured by a lien on all of our property as of, or acquired after, June 7, 2012, except for intellectual property. On December 30, 2013, in conjunction with the establishment of the Company's wholly owned subsidiary, Acceleron Securities Corp., the Loan Agreement was modified to add a debt covenant that required the Company to maintain a cash balance equal to 150% of the outstanding principal debt balance in a separate bank account, at all times. That bank account could have been subject to the lender's exclusive control in the event of a default. The debt facility was to mature in December 2015, but was paid off in March 2014.

As of December 31, 2014, we had $176.5 million in cash and cash equivalents. Cash in excess of immediate requirements is invested in accordance with our investment policy, primarily with a view to liquidity and capital preservation. Currently, our funds are held in money market mutual funds consisting of U.S. government-backed securities.

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Cash Flows

The following table sets forth the primary sources and uses of cash for each of the years set forth below:

	Year Ended December 31,		
(in thousands)	2014	2013	2012
Net cash provided by (used in):			
Operating activities	$(53,220)	$(19,650)	$(38,884)
Investing activities	(514)	(307)	(441)
Financing activities	117,031	93,509	13,899
Net increase (decrease) in cash and cash equivalents	$63,297	$73,552	$(25,426)

Operating Activities.

Net cash used in operating activities was $53.2 million for the year ended December 31, 2014, and consisted primarily of a net loss of $51.3 million adjusted for non-cash items including a decrease in fair value of warrants of $5.0 million, stock-based compensation expense of $4.8 million, depreciation and amortization of $1.1 million, payments of deferred interest of $0.5 million, and a net decrease due to changes in operating assets and liabilities of $2.3 million. The significant items in the change in operating assets and liabilities include a decrease in deferred revenue of $1.7 million for the Celgene Collaboration. Other components of the change in operating assets and liabilities include a decrease in collaboration receivables of $0.2 million, a decrease in deferred rent of $0.5 million, a decrease in accounts payable of $0.2 million, and an increase in prepaid and other current assets of $0.3 million.

Net cash used in operating activities was $19.6 million for the year ended December 31, 2013, and consisted primarily of a net loss of $21.9 million adjusted for non-cash items including an increase in fair value of warrants of $26.9 million, stock-based compensation expense of $2.2 million, depreciation and amortization of $0.9 million, forgiveness of the related party receivable of $0.2 million, accretion of deferred interest of $0.3 million, and amortization of deferred debt issuance costs of $0.2 million, and a net decrease due to changes in operating assets and liabilities of $28.5 million. The significant items in the change in operating assets and liabilities include a decrease in deferred revenue of $26.9 million due primarily to the recognition of $24.3 million of deferred revenue for the Shire collaboration agreement, which was terminated effective June 30, 2013. Other components of the change in operating assets and liabilities include an increase in accrued expenses of $0.7 million, an increase in collaboration receivables of $0.8 million, an increase in prepaid expenses of $0.8 million, a decrease in deferred rent of $0.5 million and a decrease in accounts payable of $0.1 million.

Net cash used in operating activities was $38.9 million for the year ended December 31, 2012, and is primarily due to a net loss of $32.6 million adjusted for non-cash items including an increase in the fair value of warrants of $2.3 million, stock-based compensation of $1.2 million, depreciation and amortization of $1.3 million, and accretion of deferred interest of $0.3 million and a net decrease in operating assets and liabilities of $11.5 million. The significant items in the change in operating assets and liabilities include a decrease in deferred revenue of $9.7 million due to the ongoing recognition of revenue deferred in connection with up-front payments for the Celgene and Shire collaboration agreements, a decrease in accounts payable of $1.3 million and an increase in collaboration receivables of $1.1 million, offset in part by an increase in accrued expenses of $1.6 million. Other components of the change in operating assets and liabilities include an increase in prepaid expenses and other current assets of $0.6 million and a decrease in deferred rent of $0.5 million.

Investing Activities.

Net cash used in investing activities was $0.5 million, $0.3 million and $0.4 million for the years ended December 31, 2014, 2013 and 2012, respectively, and consisted of purchases of property and equipment.

Financing Activities.

Net cash provided by financing activities was $117.0 million for the year ended December 31, 2014 and consisted of $129.2 million in net proceeds received from our follow on public offering and $4.2 million from the exercise of stock options and warrants, offset in part by $16.3 million of principal repayments to pay off our venture debt credit facility.

Net cash provided by financing activities was $93.5 million for the year ended December 31, 2013 and consisted of $96.8 million in net proceeds received from our initial public offering and concurrent private placement, and

$0.7 million of proceeds from the exercise of stock options and warrants to purchase common stock, offset in part by $3.7 million of principal payments made to pay down our venture debt credit facility, and $0.3 million paid to repurchase and retire redeemable convertible preferred stock, common stock and warrants to purchase common stock.

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Net cash provided by financing activities was $13.9 million for the year ended December 31, 2012 and consisted of $19.9 million in net proceeds received from the drawdown of our new venture debt line in June 2012, as well as $0.2 million received from the exercise of stock options and warrants to purchase common stock, offset in part by $6.2 million of principal payments made to pay down our previous venture debt credit facility.

Operating Capital Requirements

To date, we have not generated any revenue from product sales. We do not know when, or if, we will generate any revenue from product sales. We will not generate revenue from product sales unless and until we or our partners obtain regulatory approval of and commercialize one of our current or future therapeutic candidates. 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 and obtain regulatory approvals for, dalantercept, ACE-083 and any future therapeutic candidates, and begin to commercialize any approved products. We are subject to all of the risks incident in the development of therapeutic candidates, and we may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. Since the closing of our initial public offering, we have incurred, and expect to continue to incur, additional costs associated with operating as a public company. We anticipate that we will need additional funding in connection with our continuing operations.

We believe that our existing cash and cash equivalents will be sufficient to fund our projected operating requirements into the second half of 2017. However, we will require additional capital for the further development of our existing therapeutic candidates and may also need to raise additional funds sooner to pursue other development activities related to additional therapeutic candidates.

Until we can generate a sufficient amount of revenue from our products, if ever, we expect to fund our operations through a combination of equity offerings, debt financings or other sources including potential additional collaborations. Additional capital may not be available on favorable terms, if at all. If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of one or more of our therapeutic candidates. If we raise additional funds through the issuance of additional debt or equity securities, it could result in dilution to our existing stockholders and increased fixed payment obligations, and these securities may have rights senior to those of our common stock. If we incur indebtedness, we could become subject to covenants that would restrict our operations and potentially impair our competitiveness, 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 may not be able to enter into new collaboration arrangements for any of our proprietary therapeutic candidates. Any of these events could significantly harm our business, financial condition and prospects.

Our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement and involves risks and uncertainties, and actual results could vary as a result of a number of factors. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect. Our future funding requirements, both near and long-term, will depend on many factors, including, but not limited to:

- the achievement of milestones under our agreement with Celgene;
- the terms and timing of any other collaborative, licensing and other arrangements that we may establish;
- the initiation, progress, timing and completion of preclinical studies and clinical trials for our therapeutic candidates and potential therapeutic candidates;
- the number and characteristics of therapeutic candidates that we pursue;
- the progress, costs and results of our clinical trials;
- the outcome, timing and cost of regulatory approvals;

- delays that may be caused by changing regulatory requirements;
- the cost and timing of hiring new employees to support our continued growth;
- the costs involved in filing and prosecuting patent applications and enforcing and defending patent claims;

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- the costs and timing of procuring clinical and commercial supplies of our therapeutic candidates;

- the extent to which we acquire or invest in businesses, products or technologies; and

- the costs involved in defending and prosecuting litigation regarding in-licensed intellectual property.

Contractual Obligations and Commitments

The following is a summary of our long-term contractual cash obligations as of December 31, 2014.

(in thousands)	Total	1 year	2 - 3 years	4 - 5 years
Operating lease obligations(1)	$14,936	$4,106	$7,876	$2,954
Less: sublease income(2)	(241)	(241)	—	—
Total	$14,695	$3,865	$7,876	$2,954

(1) We lease office and lab space at 128 Sidney Street and 149 Sidney Street in Cambridge, Massachusetts under noncancelable operating leases that expire in September 2018, and at 12 Emily Street in Cambridge, Massachusetts under a noncancelable operating lease that expires in May 2015. Our leasehold improvements are being amortized over 3-10 years which represent the shorter of their useful life or remaining lease term.

(2) In February 2011, we entered into a sublease for 14,214 square feet of office space at 12 Emily Street in Cambridge, Massachusetts, that expires in May 2015. On December 31, 2013 the sublease was expanded to the remaining space in that facility. The expansion portion sublease expired in December 2014.

We also have obligations to make future payments to third party licensors that become due and payable on the achievement of certain development, regulatory and commercial milestones. We have not included these commitments on our consolidated balance sheet or in the table above because the achievement and timing of these milestones is not fixed or determinable. These commitments include the following:

- Under our license agreement with the Beth Israel Deaconess Medical Center, or BIDMC, in respect of BIDMC's joint interest in patent rights related to the treatment of renal cell cancer by combination therapy with dalantercept and VEGF-receptor tyrosine kinase inhibitors, we agreed to pay BIDMC specified development and sales milestone payments aggregating up to $1.0 million. In addition, we are required to pay BIDMC royalties in the low single digits on worldwide net product sales of drug labeled for treatment regimens that are claimed in the licensed patents.

- Under our license agreement with the Ludwig Institute for Cancer Research, or LICR, in respect of patent rights relating to the first cloning of the type I activin receptors, as well as the treatment of pancreatic tumors with dalantercept, we agreed to pay LICR specified development and sales milestone payments aggregating up to $1.6 million relating to the development and commercialization of dalantercept. In addition, we are required to pay LICR royalties in the low single-digits on worldwide net product sales of dalantercept, with royalty obligations continuing at a 50% reduced rate for a period of time after patent expiration. If we sublicense the LICR patent rights, we will owe LICR a percentage of sublicensing revenue, excluding payments based on the level of sales, profits or other levels of commercialization.

- Under our two license agreements with the Salk Institute for Biological Studies, or Salk, relating to the first cloning of the type II activin receptors, if we sublicense the Salk patent rights, we will owe Salk a percentage of sublicensing revenue, excluding payments based on sales. Under one agreement, we agreed to pay Salk specified development milestone payments totaling up to $2.0 million for sotatercept. Under the other agreement, we agreed to pay Salk specified development milestone payments of up to $0.7 million for luspatercept. In addition, under both agreements, we are required to pay Salk royalties in the low single-digits on worldwide net product sales by us or our sublicensees under the licensed patent rights of products claimed in the licensed patents, or products derived from use of the licensed patent rights, with royalty obligations for sotatercept continuing at a reduced rate for a period of time after patent expiration.

- In May 2014, we executed a collaboration agreement with a research technology company. We paid an upfront and research fee of $0.3 million upon execution of the agreement and we are obligated to pay additional research fees of approximately $0.6 million within the next year, depending on the success of the research program. We also received

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an option to obtain a commercial license to the molecules developed during the collaboration, which, if exercised, would obligate us to pay royalty and milestone payments.

We enter into contracts in the normal course of business with CROs for clinical trials and clinical supply manufacturing and with vendors for preclinical safety and research studies, research supplies and other services and products for operating purposes. These contracts generally provide for termination on notice, and therefore are cancelable contracts and not included in the table of contractual obligations and commitments.

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Net Operating Loss (NOL) Carryforwards

We have deferred tax assets of approximately $89.8 million as of December 31, 2014, which have been fully offset by a valuation allowance due to uncertainties surrounding our ability to realize these tax benefits. The deferred tax assets are primarily composed of federal and state tax net operating loss, or NOL, carryforwards, research and development tax credit carryforwards, and deferred revenue, accruals and other temporary differences. As of December 31, 2014, we had federal NOL carryforwards of approximately $211.2 million and state NOL carryforwards of $165.0 million available to reduce future taxable income, if any. These federal NOL carryforwards expire at various times through 2034 and the state NOL carryforwards expire at various times through 2034. In general, if we experience a greater than 50 percent aggregate change in ownership of certain significant stockholders over a three-year period, or a Section 382 ownership change, utilization of our pre-change NOL carryforwards are subject to an annual limitation under Section 382 of the Internal Revenue Code of 1986, as amended, and similar state laws. Such limitations may result in expiration of a portion of the NOL carryforwards before utilization and may be substantial. If we experience a Section 382 ownership change in connection with our public offerings or as a result of future changes in our stock ownership, some of which changes are outside our control, the tax benefits related to the NOL carryforwards may be limited or lost. For additional information about our taxes, see Note 12 to the financial statements in this Annual Report on Form 10-K.

Off-Balance Sheet Arrangements

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

Item 7A. Quantitative and Qualitative Disclosures About Market Risks

We are exposed to market risk related to changes in interest rates. As of December 31, 2014, we had cash and cash equivalents of $176.5 million. Our cash equivalents are invested in money market mutual funds consisting of U.S. government-backed securities. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates, particularly because our investments are in short-term securities. Due to the short-term duration of our investment portfolio and the low risk profile of our investments, an immediate 100 basis point change in interest rates would not have a material effect on the fair market value of our portfolio.

Item 8. Financial Statements and Supplementary Data

All financial statements and supplementary data required to be filed hereunder are filed as listed under Item 15(a) of this Annual Report on Form 10-K and are incorporated herein by this reference.

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

None.

Item 9A. Controls and Procedures

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

As of December 31, 2014, management, with the participation of our Chief Executive Officer and Chief Financial Officer, performed an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures as defined in Rules 13a-15(e) and 15d-15(e) of the Exchange Act. Our disclosure controls and procedures are designed to ensure that information required to be disclosed in the reports we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms, and that such information is accumulated and communicated to our management, including the Chief Executive Officer and the Chief Financial Officer, to allow timely decisions regarding required disclosures. Any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objective. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that, as of December 31, 2014, the design and operation of our disclosure controls and procedures were effective.

Management's Report on Internal Control Over Financial Reporting

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rule 13a-15(f) and 15d-15(f) of the Exchange Act. Because of its inherent limitations, internal control over financial reporting may not prevent or detect

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misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policy or procedures may deteriorate. Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, management has conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2014 based upon the Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on this evaluation, management, including our Chief Executive Officer and Chief Financial Officer, has concluded that our internal control over financial reporting was effective as of December 31, 2014.

The effectiveness of our internal control over financial reporting as of December 31, 2014 has been audited by Ernst & Young LLP, our independent registered public accounting firm, as stated in their report which is included herein.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act) during the year ended December 31, 2014, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders of
Acceleron Pharma Inc.

We have audited Acceleron Pharma Inc.'s internal control over financial reporting as of December 31, 2014, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). Acceleron Pharma Inc.'s management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the company's internal control over financial reporting based on our audit.

We conducted our audit 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 effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

In our opinion, Acceleron Pharma Inc. maintained, in all material respects, effective internal control over financial reporting as of December 31, 2014, based on the COSO criteria.

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We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of Acceleron Pharma Inc. as of December 31, 2014 and 2013, and the related consolidated statements of operations and comprehensive loss, redeemable convertible preferred stock and stockholders' equity (deficit) and cash flows for each of the three years in the period ended December 31, 2014 of Acceleron Pharma Inc. and our report dated March 2, 2015 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 2, 2015

Item 9B. Other Information

None.

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PART III

Certain information required by Part III is omitted from this Annual Report on Form 10-K and is incorporated herein by reference from our definitive proxy statement relating to our 2015 annual meeting of stockholders, pursuant to Regulation 14A of the Securities Exchange Act of 1934, as amended, also referred to in this Form 10-K as our 2015 Proxy Statement, which we expect to file with the SEC no later than April 30, 2015.

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this Item 10 is incorporated herein by reference to our 2015 Proxy Statement.

Item 11. Executive Compensation

The information required by this Item 11 is incorporated herein by reference to our 2015 Proxy Statement.

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

The information required by this Item 12 is incorporated herein by reference to our 2015 Proxy Statement.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by this Item 13 is incorporated herein by reference to our 2015 Proxy Statement.

Item 14. Principal Accounting Fees and Services

The information required by this Item 14 is incorporated herein by reference to our 2015 Proxy Statement.

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PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) The following documents are filed as part of this report:

Financial Statements.

(2) Financial Statement Schedules

We are not filing any financial statement schedules as part of this Annual Report on Form 10-K because they are not applicable or the required information is included in the consolidated financial statements or notes thereto.

(3) Exhibits

The list of Exhibits filed as a part of this Annual Report on Form 10-K is set forth on the Exhibit Index immediately preceding such Exhibits and is incorporated herein by this reference.

(b) The list of Exhibits filed as a part of this Annual Report on Form 10-K is set forth on the Exhibit Index immediately preceding such Exhibits and is incorporated herein by this reference.

(c) None.

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Acceleron Pharma Inc.
Index to Consolidated Financial Statements

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Report of Independent Registered Public Accounting Firm
The Board of Directors and Stockholders of
Acceleron Pharma Inc.

We have audited the accompanying consolidated balance sheets of Acceleron Pharma Inc. as of December 31, 2014 and 2013, and the related consolidated statements of operations and comprehensive loss, redeemable convertible preferred stock and stockholders' equity (deficit) and cash flows for each of the three years in the period ended December 31, 2014. 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. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as 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 consolidated financial position of Acceleron Pharma Inc. at December 31, 2014 and 2013, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 2014, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), Acceleron Pharma Inc.'s internal control over financial reporting as of December 31, 2014, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 2, 2015 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 2, 2015

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Acceleron Pharma Inc.
Consolidated Balance Sheets
(amounts in thousands except share and per share data)

	December 31, 2014	2013
Assets		
Current assets:		
Cash and cash equivalents	$176,460	$113,163
Collaboration receivables (all amounts are with a related party)	3,367	3,616
Prepaid expenses and other current assets	2,480	2,243
Total current assets	182,307	119,022
Property and equipment, net	3,087	3,705
Restricted cash	902	913
Other assets	—	92
Total assets	$186,296	$123,732
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$724	$885
Accrued expenses	6,848	6,927
Deferred revenue	1,162	2,031
Deferred rent	519	499
Notes payable, net of discount	—	16,868
Total current liabilities	9,253	27,210
Deferred revenue, net of current portion	4,816	5,620
Deferred rent, net of current portion	1,818	2,337
Warrants to purchase common stock	14,124	30,753
Total liabilities	30,011	65,920
Commitments and contingencies (Note 7)	—	—
Stockholders' equity:		
Undesignated preferred stock, $0.001 par value: 25,000,000 shares authorized and no shares issued or outstanding	—	—
Common stock, $0.001 par value: 175,000,000 shares authorized; 32,432,025 and 28,348,630, shares issued and outstanding at December 31, 2014 and 2013, respectively	33	29
Additional paid-in capital	399,835	250,107
Accumulated deficit	(243,583)	(192,324)
Total stockholders' equity	156,285	57,812
Total liabilities and stockholders' equity	$186,296	$123,732

See accompanying notes to consolidated financial statements.

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Acceleron Pharma Inc.
Consolidated Statements of Operations and Comprehensive Loss
(amounts in thousands except per share data)

	Year Ended December 31,		
	2014	2013	2012
Revenue:			
Collaboration revenue:			
License and milestone	$1,673	$43,948	$9,696
Cost-sharing, net	12,959	13,282	5,558
Total revenue(1)	14,632	57,230	15,254
Costs and expenses:			
Research and development	50,897	36,051	35,319
Litigation settlement	5,000	—	—
General and administrative	14,199	14,227	8,824
Total costs and expenses	70,096	50,278	44,143
(Loss) income from operations	(55,464)	6,952	(28,889)
Other income (expense):			
Other income (expense), net	5,044	(26,797)	(2,255)
Interest income	83	39	91
Interest expense	(922)	(2,092)	(1,529)
Total other income (expense), net	4,205	(28,850)	(3,693)
Net loss	$(51,259)	$(21,898)	$(32,582)
Comprehensive loss	$(51,259)	$(21,898)	$(32,582)
Reconciliation of net loss to net loss applicable to common stockholders:			
Net loss	$(51,259)	$(21,898)	$(32,582)
Accretion of dividends, interest, redemption value and issuance costs on redeemable convertible preferred stock	—	(19,870)	(27,061)
Gain on extinguishment of redeemable convertible preferred stock	—	2,765	—
Net loss applicable to common stockholders—basic and diluted	$(51,259)	$(39,003)	$(59,643)
Net loss per share applicable to common stockholders-basic and diluted	$(1.63)	$(4.15)	$(24.84)
Weighted-average number of common shares used in computing net loss per share applicable to common stockholders-basic and diluted	31,515	9,407	2,401

(1) Includes related party revenue (Note 14) $14,632 $32,284 $4,914

See accompanying notes to consolidated financial statements.

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Acceleron Pharma Inc.
Consolidated Statements of Redeemable Convertible Preferred Stock and Stockholders' Equity (Deficit)
(amounts in thousands except share and per share data)

	Series A Redeemable Convertible Preferred Stock		Series B Redeemable Convertible Preferred Stock		Series C Redeemable Convertible Preferred Stock		Series C-1 Redeemable Convertible Preferred Stock		Series D Redeemable Convertible Preferred Stock	
	Number of Shares	Value	Number of Shares	Value	Number of Shares	Value	Number of Shares	Value	Number of Shares	Value
Balance at December 31, 2011	6,410,976	$62,049	4,204,185	$61,464	2,978,062	$54,320	457,875	$8,479	234,940	$3,657
Accretion of dividends, interest, redemption value and issuance costs related to redeemable convertible preferred stock	—	4,616	—	5,580	—	5,589	—	908	—	668
Compensation expense associated with stock options	—	—	—	—	—	—	—	—	—	—
Exercise of stock options	—	—	—	—	—	—	—	—	—	—
Net loss	—	—	—	—	—	—	—	—	—	—
Balance at December 31, 2012	6,410,976	66,665	4,204,185	67,044	2,978,062	59,909	457,875	9,387	234,940	4,325
Accretion of dividends, interest, redemption value and issuance costs related to redeemable convertible preferred stock	—	3,408	—	4,138	—	4,068	—	661	—	487
Repurchase and retirement of redeemable convertible preferred stock	—	—	(139,741)	(2,267)	(21,744)	(445)	—	—	(2,906)	(54)
	46,668	678	—	—	—	—	—	—	—	—

Exercise of warrants to purchase convertible preferred stock										
Exercise of warrants to purchase common stock	—	—	—	—	—	—	—	—	—	—
Compensation expense associated with stock options	—	—	—	—	—	—	—	—	—	—
Exercise of stock options	—	—	—	—	—	—	—	—	—	—
Conversion of redeemable convertible preferred stock into common stock	(6,457,644)	(70,751)	(4,064,444)	(68,915)	(2,956,318)	(63,532)	(457,875)	(10,048)	(232,034)	(4,758)
Reclassification of warrants to purchase shares of redeemable convertible preferred stock into warrants to purchase common stock	—	—	—	—	—	—	—	—	—	—
Issuance of common stock in connection with initial public offering and private placement, net of issuance costs of $2,692	—	—	—	—	—	—	—	—	—	—
Net loss	—	—	—	—	—	—	—	—	—	—
Balance at December 31, 2013	—	—	—	—	—	—	—	—	—	—
Issuance of common stock net of expenses of $554	—	—	—	—	—	—	—	—	—	—
Stock-based compensation	—	—	—	—	—	—	—	—	—	—
Exercise of stock options	—	—	—	—	—	—	—	—	—	—

Net exercise of warrants to purchase common stock	—	—	—	—	—	—	—	—	—	—
Exercise of warrants to purchase common stock	—	—	—	—	—	—	—	—	—	—
Net loss	—	—	—	—	—	—	—	—	—	—
Balance at December 31, 2014	—	$—	—	$—	—	$—	—	$—	—	$—

See accompanying notes to consolidated financial statements.

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Acceleron Pharma Inc.
Consolidated Statements of Redeemable Convertible Preferred Stock and Stockholders' Equity (Deficit) (Continued)
(amounts in thousands except share and per share data)

	Series E Redeemable Convertible Preferred Stock		Series F Redeemable Convertible Preferred Stock		Total Redeemable Convertible Preferred Stock	Common Stock				
	Number of Shares	Value	Number of Shares	Value		Number of Shares	$0.001 Par Value	Additional Paid-In Capital	Accumulated Deficit	Total Stockholder Equity (Def
Balance at December 31, 2011	816,060	$10,934	2,426,171	$30,518	$241,549	2,393,458	$3	$—	$(232,694)	$(232,691)
Accretion of dividends, interest, redemption value and issuance costs related to redeemable convertible preferred stock	—	2,459	—	5,505	27,061	—	—	(1,361)	(25,700)	(27,061)
Compensation expense associated with stock options	—	—	—	—	—	—	—	1,206	—	1,206
Exercise of stock options	—	—	—	—	—	38,697	—	155	—	155
Net loss	—	—	—	—	—	—	—	—	(32,582)	(32,582)
Balance at December 31, 2012	816,060	13,393	2,426,171	36,023	268,610	2,432,155	3	—	(290,976)	(290,973)
Accretion of dividends, interest, redemption value and issuance costs related to redeemable convertible preferred stock	—	1,802	—	4,033	19,870	—	—	(4,230)	(15,640)	(19,870)
Repurchase and retirement of redeemable convertible preferred stock	(13,103)	(224)	(4,825)	(74)	(3,064)	(722)	—	2,773	—	2,773
	—	—	—	—	678	—	—	—	—	—

Exercise of warrants to purchase convertible preferred stock										
Exercise of warrants to purchase common stock	—	—	—	—	—	23,735	—	—	—	—
Compensation expense associated with stock options	—	—	—	—	—	—	—	2,196	—	2,196
Exercise of stock options	—	—	—	—	—	292,802	—	653	—	653
Conversion of redeemable convertible preferred stock into common stock	(802,957)	(14,971)	(2,421,346)	(39,982)	(286,094)	18,516,993	19	149,885	136,190	286,094
Reclassification of warrants to purchase shares of redeemable convertible preferred stock into warrants to purchase common stock	—	—	—	—	—	—	—	2,012	—	2,012
Issuance of common stock in connection with initial public offering and private placement, net of issuance costs of $2,692	—	—	—	—	—	7,083,667	7	96,818	—	96,825
Net loss	—	—	—	—	—	—	—	—	(21,898)	(21,898)
Balance at December 31, 2013	—	—	—	—	—	28,348,630	29	250,107	(192,324)	57,812
Issuance of common stock net of expenses of $554	—	—	—	—	—	2,760,000	3	129,171	—	129,174
Stock-based compensation	—	—	—	—	—	—	—	4,778	—	4,778
Exercise of stock options	—	—	—	—	—	853,507	1	3,207	—	3,208

Net exercise of warrants to purchase common stock	—	—	—	—	—	303,204	—	7,422	—	7,422
Exercise of warrants to purchase common stock	—	—	—	—	—	166,684	—	5,150	—	5,150
Net loss	—	—	—	—	—	—	—	—	(51,259)	(51,259)
Balance at December 31, 2014	—	$—	—	$—	$—	32,432,025	$33	$399,835	$(243,583)	$156,285

See accompanying notes to consolidated financial statements.

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Acceleron Pharma Inc.
Consolidated Statements of Cash Flows
(amounts in thousands)

	Year Ended December 31,		
	2014	2013	2012
Operating Activities			
Net loss	$(51,259)	$(21,898)	$(32,582)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	1,118	915	1,293
Loss on disposition of property and equipment	25	32	—
Stock-based compensation	4,778	2,196	1,206
Amortization of debt discount	—	—	51
Accretion of deferred interest	(536)	342	335
Amortization of deferred debt issuance costs	36	186	84
Change in fair value of warrants	(5,037)	26,875	2,258
Gain on retirement of warrants	—	(76)	—
Forgiveness of related party receivable	—	237	—
Changes in assets and liabilities:			
Prepaid expenses and other current assets	(255)	(823)	(594)
Collaboration receivables	249	(840)	(1,116)
Related party receivable	—	(4)	(8)
Accounts payable	(161)	(53)	(1,272)
Accrued expenses	(17)	709	1,640
Deferred revenue	(1,673)	(26,949)	(9,696)
Deferred rent	(499)	(499)	(482)
Restricted cash	11	—	(1)
Net cash used in operating activities	(53,220)	(19,650)	(38,884)
Investing Activities			
Purchases of property and equipment	(514)	(307)	(441)
Net cash used in investing activities	(514)	(307)	(441)
Financing Activities			
Proceeds from long-term debt, net of issuance costs	—	—	19,935
Proceeds from issuance of common stock from public offering, net of issuance costs	129,174	86,825	—
Proceeds from issuance of common stock from private placements	—	10,000	—
Payments of long-term debt	(16,331)	(3,669)	(6,191)
Payments made to repurchase redeemable convertible preferred stock, common stock and warrants to purchase common stock	—	(300)	—
Proceeds from exercise of stock options and warrants to purchase common stock	4,188	653	155
Net cash provided by financing activities	117,031	93,509	13,899
Net increase (decrease) in cash and cash equivalents	63,297	73,552	(25,426)
Cash and cash equivalents at beginning of period	113,163	39,611	65,037
Cash and cash equivalents at end of period	$176,460	$113,163	$39,611
Supplemental Disclosure of Cash Flow Information:			
Cash paid for interest	$1,574	$1,657	$1,065
Supplemental Disclosure of Non-Cash Investing and Financing Activities:			

Accretion of dividends, interest, redemption value, and issuance costs on preferred stock	$—	$19,870	$27,061
Conversion of preferred stock into common stock	$—	$286,094	$—
Conversion of preferred stock warrants into common stock warrants	$—	$2,012	$—
Reclassification of warrant liability to additional paid-in capital	$11,592	$678	$—
Capitalized follow-on public offering costs included in accrued expenses	$—	$74	$—
Purchase of property and equipment included in accounts payable and accrued expenses	$11	$297	$—

See accompanying notes to consolidated financial statements.

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Acceleron Pharma Inc.
Notes to Consolidated Financial Statements
Years Ended December 31, 2014, 2013 and 2012

1. Nature of Business

Acceleron Pharma Inc. (Acceleron or the Company) was incorporated in the state of Delaware on June 13, 2003, as Phoenix Pharma, Inc. The Company subsequently changed its name to Acceleron Pharma Inc. and commenced operations in February 2004. The Company is a Cambridge, Massachusetts-based biopharmaceutical company focused on the discovery, development and commercialization of novel therapeutic candidates that are based on the mechanisms that the human body uses to regulate the growth and repair of its cells and tissues. The Company's research focuses on key natural regulators of cellular growth and repair, particularly the Transforming Growth Factor-Beta (TGF-ß) protein superfamily. By combining its discovery and development expertise, including its proprietary knowledge of the TGF-ß superfamily, and its internal protein engineering and manufacturing capabilities, the Company has built a highly productive discovery and development platform that has generated innovative therapeutic candidates with novel mechanisms of action. The Company has four internally discovered therapeutic candidates that are currently in clinical trials.

The Company is subject to risks common to companies in the biotechnology industry, including, but not limited to, risk that the Company never achieves profitability, the need for substantial additional financing, risk of relying on third parties, risks of clinical trial failures, dependence on key personnel, protection of proprietary technology and compliance with government regulations.

2. Summary of Significant Accounting Policies

The accompanying consolidated financial statements reflect the application of certain significant accounting policies as described below and elsewhere in these notes to the consolidated financial statements. The Company believes that a significant accounting policy is one that is both important to the portrayal of the Company's financial condition and results, and requires management's most difficult, subjective, or complex judgments, often as the result of the need to make estimates about the effect of matters that are inherently uncertain.

Principles of Consolidation

The accompanying consolidated financial statements include those of the Company and its wholly-owned subsidiary, Acceleron Securities Corp. All significant intercompany balances and transactions have been eliminated in consolidation.

Basis of Presentation

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

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts expensed during the reporting period.

Management considers many factors in selecting appropriate financial accounting policies and controls, and in developing the estimates and assumptions that are used in the preparation of these consolidated financial statements. Management must apply significant judgment in this process. In addition, other factors may affect estimates, including: expected business and operational changes, sensitivity and volatility associated with the assumptions used in developing estimates, and whether historical trends are expected to be representative of future trends. The estimation process often may yield a range of potentially reasonable estimates of the ultimate future outcomes and management must select an amount that falls within that range of reasonable estimates. This process may result in actual results differing materially from those estimated amounts used in the preparation of the consolidated financial statements if these results differ from historical experience, or other assumptions do not turn out to be substantially

accurate, even if such assumptions are reasonable when made. In preparing these consolidated financial statements, management used significant estimates in the following areas, among others: revenue recognition, stock-based compensation expense, the determination of the fair value of stock-based awards, the fair value of liability-classified warrants, accrued expenses, and the recoverability of the Company's net deferred tax assets and related valuation allowance.

The Company utilized significant estimates and assumptions in determining the fair value of its common stock, prior to the completion of its initial public offering (IPO). The Company's board of directors (the Board) determined the estimated fair value of the Company's common stock based on a number of objective and subjective factors, including external market conditions affecting the biotechnology industry sector and the prices at which the Company sold shares of redeemable convertible preferred stock, the superior rights and preferences of securities senior to the Company's common stock at the time, and the likelihood of achieving a liquidity event, such as an IPO or sale of the Company.

Collaboration Receivable

Credit is extended to customers based upon an evaluation of the customer's financial condition. Collaboration receivables are recorded at net realizable value. The Company does not charge interest on past due balances. Collaboration receivables are determined to be past due when the payment due date is exceeded. The Company utilizes a specific identification accounts receivable reserve methodology based on a review of outstanding balances and previous activities to determine the allowance for doubtful accounts. The Company charges off uncollectible receivables at the time the Company determines the receivable is no longer collectible. The Company did not have an allowance for doubtful accounts at December 31, 2014 or 2013.

Segment Information

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker, or decision making group, in making decisions on how to allocate resources and assess performance. The Company's chief operating decision maker is the chief executive officer. The Company and the chief executive officer view the Company's operations and manage its business as one operating segment, which is the discovery, development and commercialization of novel protein therapeutics for cancer and rare diseases. All material long-lived assets of the Company reside in the United States. The Company does use contract research organizations (CROs) and research institutions located outside the United States. Some of these expenses are subject to collaboration reimbursement which is presented as a component of cost sharing, net in the consolidated statements of operations and comprehensive loss.

Cash and Cash Equivalents and Restricted Cash

The Company considers all highly liquid investments purchased with original maturities of 90 days or less at acquisition to be cash equivalents. Cash and cash equivalents include cash held in banks and amounts held in interest-bearing money market accounts. Cash equivalents are carried at cost, which approximates their fair market value.

Concentrations of Credit Risk and Off-Balance Sheet Risk

The Company has no off-balance sheet risk, such as foreign exchange contracts, option contracts, or other foreign hedging arrangements. Financial instruments that potentially subject the Company to concentrations of credit risk are primarily cash, cash equivalents, restricted cash and collaboration receivables. The Company maintains its cash and cash equivalent balances in the form of money market accounts with financial institutions that management believes are creditworthy. The Company's investment policy includes guidelines on the quality of the institutions and financial instruments and defines allowable investments that the Company believes minimizes the exposure to concentrations of credit risk.

The Company routinely assesses the creditworthiness of its customers and collaboration partners. The Company has not experienced any material losses related to receivables from individual customers and collaboration partners, or groups of customers. The Company does not require collateral. Due to these factors, no additional credit risk beyond amounts provided for collection losses is believed by management to be probable in the Company's collaboration receivables.

Disclosure of Fair Value of Financial Instruments

The carrying amounts of the Company's financial instruments, which include cash, cash equivalents, certificates of deposit, collaboration receivables, accounts payable, accrued expenses and notes payable, approximated their fair values at December 31, 2014 or 2013 due to the short-term nature of these instruments, and for the notes payable, the interest rates the Company believes it could obtain for borrowings with similar terms. See discussion below on the determination of the fair value of the Company's preferred and common stock warrants.

The Company has evaluated the estimated fair value of financial instruments using available market information and management's estimates. The use of different market assumptions and/or estimation methodologies could have a significant effect on the estimated fair value amounts.

Fair Value Measurements

ASC Topic 820, Fair Value Measurement (ASC 820), establishes a fair value hierarchy for instruments measured at fair value that distinguishes between assumptions based on market data (observable inputs) and the Company's own assumptions (unobservable inputs). Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the inputs that market participants would use in pricing the asset or liability, and are developed based on the best information available in the circumstances.

ASC 820 identifies fair value as the exchange price, or exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As a basis for considering market participant assumptions in fair value measurements, ASC 820 establishes a three-tier fair value hierarchy that distinguishes between the following:

- Level 1—Quoted market prices in active markets for identical assets or liabilities.
- Level 2—Inputs other than Level 1 inputs that are either directly or indirectly observable, such as quoted market prices, interest rates, and yield curves.
- Level 3—Unobservable inputs developed using estimates of assumptions developed by the Company, which reflect those that a market participant would use.

To the extent that the valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment. Accordingly, the degree of judgment exercised by the Company in determining fair value is greatest for instruments categorized in Level 3. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement.

Items measured at fair value on a recurring basis include warrants to purchase redeemable convertible preferred stock, which were outstanding until the closing of the IPO, and warrants to purchase common stock (Note 6). During the periods presented, the Company has not changed the manner in which it values assets and liabilities that are measured at fair value using Level 3 inputs.

The following tables set forth the Company's financial instruments carried at fair value using the lowest level of input applicable to each financial instrument as of December 31, 2014 and 2013 and (in thousands):

	December 31, 2014			
	Quoted Prices in Active Markets for Identical Items (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Assets:				
Money market funds	$169,679	$—	$—	$169,679
Restricted cash	902	—	—	902
Total assets	$170,581	$—	$—	$170,581
Liabilities:				
Warrants to purchase common stock	$—	$—	$14,124	$14,124
Total liabilities	$—	$—	$14,124	$14,124

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	December 31, 2013			
	Quoted Prices in Active Markets for Identical Items (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Assets:				
Money market funds	$101,394	$—	$—	$101,394
Restricted cash	913	—	—	913
Total assets	$102,307	$—	$—	$102,307
Liabilities:				
Warrants to purchase common stock	$—	$—	$30,753	$30,753
Total liabilities	$—	$—	$30,753	$30,753

The following table sets forth a summary of changes in the fair value of the Company's preferred and common stock warrant liabilities, which represent a recurring measurement that is classified within Level 3 of the fair value hierarchy, wherein fair value is estimated using significant unobservable inputs (in thousands):

	Year Ended December 31,	
	2014	2013
Beginning balance	$30,753	$6,651
Change in fair value	(5,037)	26,875
Exercises	(11,592)	(678)
Repurchases	—	(83)
Conversions	—	(2,012)
Ending balance	$14,124	$30,753

The money market funds noted above are included in cash and cash equivalents in the accompanying consolidated balance sheets. The Company recognizes transfers between levels of the fair value hierarchy as of the end of the reporting period. There were no transfers within the hierarchy during the years ended December 31, 2014 and 2013 except for the transfer out of the warrants to purchase redeemable convertible preferred stock as described below.

During 2013, as a result of the closing of the IPO, the warrants to purchase preferred stock were converted to warrants to purchase common stock. The resulting warrants to purchase common stock meet the criteria to be classified as permanent equity and are no longer required to be measured at fair value at each reporting period.

The fair value of the warrants to purchase preferred stock that were classified as liabilities was estimated using the Black-Scholes option pricing model at the date of issuance and on each re-measurement date. This method of valuation involves using inputs such as the fair value of the Company's various classes of preferred stock, stock price volatility, the contractual term of the warrants, risk free interest rates, and dividend yields. Due to the nature of these inputs, the valuation of the warrants is considered a Level 3 measurement.

The fair value of the warrants to purchase common stock on the date of issuance and on each re-measurement date for those warrants to purchase common stock classified as liabilities was estimated using either the Monte Carlo simulation framework, which incorporates future financing events over the remaining life of the warrants to purchase common stock, or for certain re-measurement dates including December 31, 2013 and 2014, due to the warrants being deeply in the money, the Black-Scholes option pricing model was used. At each reporting period the company evaluates the best valuation methodology. Due to the nature of these inputs, the valuation of the warrants is considered a Level 3 measurement.

See Note 6 for further discussions of the accounting for the warrants, as well as for a summary of the significant inputs and assumptions used to determine the fair value of the warrants.

The Company measures eligible assets and liabilities at fair value, with changes in value recognized in earnings. Fair value treatment may be elected either upon initial recognition of an eligible asset or liability or, for an existing asset or liability,

if an event triggers a new basis of accounting. The Company did not elect to remeasure any of its existing financial assets or liabilities, and did not elect the fair value option for any financial assets and liabilities transacted in the years ended December 31, 2014 or 2013.

Property and Equipment

Property and equipment is stated at cost. Maintenance and repairs that do not improve or extend the lives of the respective assets are expensed to operations as incurred. Upon disposal, retirement or sale the related cost and accumulated depreciation is removed from the accounts and any resulting gain or loss is included in the results of operations. Depreciation and amortization is calculated using the straight-line method over the estimated useful lives of the assets, which are as follows:

Asset	Estimated Useful Life
Computer equipment and software	3 years
Office and laboratory equipment	3 years
Leasehold improvements	Shorter of the useful life or remaining lease term

The Company reviews long-lived assets when events or changes in circumstances indicate the carrying value of the assets may not be recoverable. Recoverability is measured by comparison of the book values of the assets to future net undiscounted cash flows that the assets are expected to generate. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the book value of the assets exceed their fair value, which is measured based on the projected discounted future net cash flows arising from the assets. No impairment losses have been recorded during the years ended December 31, 2014, 2013 and 2012.

Revenue Recognition

The company has primarily generated revenue through collaboration, license and research arrangements with collaboration partners for the development and commercialization of therapeutic candidates.

The Company recognizes revenue in accordance with FASB ASC Topic 605, Revenue Recognition. Accordingly, revenue is recognized for each unit of accounting when all of the following criteria are met: (1) persuasive evidence of an arrangement exists; (2) delivery has occurred or services have been rendered; (3) the fee is fixed or determinable; and (4) collectability is reasonably assured.

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

Multiple Element Revenue Arrangements

The Company enters into collaboration agreements from time to time, which are more fully described in Note 9. The arrangements generally contain multiple elements or deliverables, which may include (1) licenses, or options to obtain licenses, to the Company's technology, (2) research and development activities performed for the collaboration partner, (3) participation on Joint Development Committees, and (4) manufacturing clinical or preclinical material. Payments pursuant to these arrangements typically include non-refundable, up-front payments, milestone payments upon achieving significant development events, research and development reimbursements, sales milestones, and royalties on future product sales.

Effective January 1, 2011, the Company adopted ASU No. 2009-13, Multiple-Deliverable Revenue Arrangements (ASU 2009-13), which amends ASC Topic 605-25, Revenue Recognition—Multiple Element Arrangements (ASC 605-25). The Company applies this guidance to new arrangements as well as existing agreements that are significantly modified after January 1, 2011. For agreements that are significantly modified, the Company determines the estimated selling price for the remaining undelivered elements as of the date of the material modification and allocates

arrangement consideration based upon the estimated selling price to the undelivered elements.

The application of the multiple element guidance requires subjective determinations, and requires management to make judgments about the individual deliverables, and whether such deliverables are separable from the other aspects of the contractual relationship. Deliverables are considered separate units of accounting provided that: (1) the delivered item(s) has value to the customer on a stand-alone basis and (2) if the arrangement includes a general right of return relative to the

delivered item(s), delivery or performance of the undelivered item(s) is considered probable and substantially in the control of the Company. In determining the units of accounting, management evaluates certain criteria, including whether the deliverables have stand-alone value, based on the consideration of the relevant facts and circumstances for each arrangement, such as the research, manufacturing and commercialization capabilities of the collaboration partner and the availability of the associated expertise in the general marketplace. In addition, the Company considers whether the collaboration partner can use the other deliverable(s) for their intended purpose without the receipt of the remaining element(s), whether the value of the deliverable is dependent on the undelivered item(s) and whether there are other vendors that can provide the undelivered element(s). Arrangement consideration that is fixed or determinable is allocated among the separate units of accounting using the relative selling price method, and the applicable revenue recognition criteria, as described above, are applied to each of the separate units of accounting in determining the appropriate period or pattern of recognition.

The Company determines the estimated selling price for deliverables within each agreement using vendor-specific objective evidence (VSOE) of selling price, if available, third-party evidence (TPE) of selling price if VSOE is not available, or management's best estimate of selling price (BESP) if neither VSOE nor TPE is available. Subsequent to the adoption of ASU 2009-13, the Company typically uses BESP to estimate the selling price of the deliverables. Determining the BESP for a unit of accounting requires significant judgment. In developing the BESP for a unit of accounting, the Company considers applicable market conditions and relevant entity-specific factors, including factors that were contemplated in negotiating the agreement with the customer and estimated costs. The Company validates the BESP for units of accounting by evaluating whether changes in the key assumptions used to determine the BESP will have a significant effect on the allocation of arrangement consideration between multiple units of accounting.

The Company typically receives up-front, non-refundable payments when licensing its intellectual property in conjunction with a collaboration agreement. When management believes the license to its intellectual property does not have stand-alone value from the other deliverables to be provided in the arrangement, the Company generally recognizes revenue attributed to the license on a straight-line basis over the contractual or estimated performance period, which is typically the term of the Company's research and development or manufacturing obligations. The Company continually evaluates these periods, and will adjust the period of revenue recognition if circumstances change. When management believes the license to its intellectual property has stand-alone value, the Company generally recognizes revenue attributed to the license upon delivery.

Research and development funding is recognized as revenue in the period that the related services are performed. When the Company acts as the principal under its collaboration agreements, it records payments received for the reimbursement of research and development costs as cost-sharing revenue in the consolidated statements of operations and comprehensive loss. To the extent that the Company reimburses the collaborator for costs incurred, the Company records these costs as a reduction of cost-sharing revenue.

The Company's agreements may contain options which provide the collaboration partner the right to obtain additional licenses. Options are considered substantive if, at the inception of the arrangement, the Company is at risk as to whether the collaboration partner will choose to exercise the option. Factors considered in evaluating whether an option is substantive include the overall objective of the arrangement, the benefit the collaborator might obtain from the arrangement without exercising the option, the cost to exercise the option and the likelihood that the option will be exercised. For arrangements under which an option is considered substantive, the Company does not consider the item underlying the option to be a deliverable at the inception of the arrangement and the associated option fees are not included in allocable arrangement consideration, assuming the option is not priced at a significant and incremental discount. Conversely, for arrangements under which an option is not considered substantive or if an option is priced at a significant and incremental discount, the Company would consider the item underlying the option to be a deliverable at the inception of the arrangement and a corresponding amount would be included in allocable arrangement consideration.

Effective January 1, 2011, the Company adopted ASU No. 2010-17, Revenue Recognition—Milestone Method (ASU 2010-17). At the inception of each arrangement that includes milestone payments, the Company evaluates, with respect to each milestone, whether the milestone is substantive and at-risk. This evaluation includes an assessment of whether (a) the consideration is commensurate with either (1) the entity's performance to achieve the milestone, or (2) the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting at least in part from the entity's performance to achieve the milestone, (b) the consideration relates solely to past performance, and (c) the consideration is reasonable relative to all of the deliverables and payment terms within the arrangement. The Company evaluates factors such as the scientific, regulatory, commercial, and other risks that must be overcome to achieve the respective milestone, the level of effort and investment required to achieve the respective milestone, and whether the milestone consideration is reasonable relative to all deliverables and payment terms in the arrangement in making this assessment. On the milestone achievement date, assuming all other

revenue recognition criteria are met and the milestone is deemed substantive and at-risk, the Company recognizes the payment as license and milestone revenue. For milestones that are not deemed substantive and at-risk, where payment is reasonably assured, the Company recognizes the milestone payment over the remaining service period.

Sales and commercial milestones and royalties will be recognized when and if earned, provided collectability is reasonably assured.

Research and Development Expenses

Research and development costs are charged to expense as costs are incurred in performing research and development activities. Research and development costs include all direct costs, including salaries, stock compensation and benefits for research and development personnel, outside consultants, costs of clinical trials, sponsored research, clinical trials insurance, other outside costs, depreciation and facility costs related to the development of drug candidates. The Company records up-front, non-refundable payments made to outside vendors, or other payments made in advance of services performed or goods being delivered, as prepaid expenses, which are expensed as services are performed or the goods are delivered.

Certain research and development projects are, or have been, partially funded by collaboration agreements, and the expenses related to these activities are included in research and development costs. The Company records the related reimbursement of research and development costs under these agreements as revenue, as more fully described above and in Note 9.

Stock-Based Compensation

At December 31, 2014, the Company had two stock-based compensation plans, which are more fully described in Note 10. The Company accounts for stock-based compensation in accordance with the provisions of ASC Topic 718, Compensation—Stock Compensation (ASC 718), which requires the recognition of expense related to the fair value of stock-based compensation awards in the consolidated statements of operations and comprehensive loss.

For stock options issued to employees and members of the Board for their services on the Board, the Company estimates the grant date fair value of each option using the Black-Scholes option-pricing model. The use of the Black-Scholes option-pricing model requires management to make assumptions with respect to the expected term of the option, the expected volatility of the common stock consistent with the expected life of the option, risk-free interest rates and expected dividend yields of the common stock. For awards subject to service-based vesting conditions, the Company recognizes stock-based compensation expense, net of estimated forfeitures, equal to the grant date fair value of stock options on a straight-line basis over the requisite service period, which is generally the vesting term. For awards subject to both performance and service-based vesting conditions, the Company recognizes stock-based compensation expense using an accelerated recognition method when it is probable that the performance condition will be achieved. Forfeitures are required to be estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates.

Share-based payments issued to non-employees are recorded at their fair values, and are periodically revalued as the equity instruments vest and are recognized as expense over the related service period in accordance with the provisions of ASC 718 and ASC Topic 505 (ASC 505), Equity. For stock-based awards granted to non-employees, the Company recognizes stock-based compensation expense using an accelerated recognition method.

See Note 10 for a discussion of the assumptions used by the Company in determining the grant date fair value of options granted under the Black-Scholes option pricing model, as well as a summary of the stock option activity under the Company's stock-based compensation plans for the year ended December 31, 2014.

Income Taxes

Income taxes are recorded in accordance with ASC Topic 740, Income Taxes (ASC 740), which provides for deferred taxes using an asset and liability approach. The Company recognizes deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. Deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets

and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. Valuation allowances are provided, if based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

The Company accounts for uncertain tax positions in accordance with the provisions of ASC 740. When uncertain tax positions exist, the Company recognizes the tax benefit of tax positions to the extent that the benefit will more likely than not be

realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position as well as consideration of the available facts and circumstances. As of December 31, 2014 or 2013, the Company does not have any significant uncertain tax positions.

Net Income (Loss) Per Share

Net income (loss) per share information is determined using the two-class method, which includes the weighted-average number of shares of common stock outstanding during the period and other securities that participate in dividends (a participating security). The Company's redeemable convertible preferred stock are participating securities as defined by ASC 260-10, Earnings Per Share.

Under the two-class method, basic net income (loss) per share applicable to common stockholders is computed by dividing the net income (loss) applicable to common stockholders by the weighted-average number of common shares outstanding for the reporting period. Diluted net income (loss) per share is computed using the more dilutive of (1) the two-class method or (2) the if-converted method. The Company allocates net income first to preferred stockholders based on dividend rights under the Company's articles of incorporation and then to preferred and common stockholders based on ownership interests. Net losses are not allocated to preferred stockholders as they do not have an obligation to share in the Company's net losses.

Diluted net income (loss) per share gives effect to all potentially dilutive securities, including redeemable convertible preferred stock, and shares issuable upon the exercise of outstanding warrants and stock options, using the treasury stock method. For the years ended December 31, 2014, 2013 and 2012, the Company has excluded the effects of all potentially dilutive shares, which include redeemable convertible preferred stock, warrants for redeemable convertible preferred stock, warrants for common stock and outstanding common stock options, from the weighted-average number of common shares outstanding as their inclusion in the computation for these years would be anti-dilutive due to net losses incurred.

The following is a summary of the common stock equivalents which were excluded from the calculation of diluted net loss per share for the periods indicated (in thousands):

	Year Ended December 31,		
	2014	2013	2012
Outstanding stock options	3,210	3,709	3,730
Common stock warrants	422	908	884
Shares issuable under employee stock purchase plan	14	—	—
Preferred stock	—	13,218	18,166
Preferred stock warrants	—	114	248
	3,646	17,949	23,028

Comprehensive Income (Loss)

Comprehensive income (loss) is defined as the change in equity of a business enterprise during a period from transactions, other events, and circumstances from non-owner sources. Comprehensive loss consists of net loss and other comprehensive loss, which includes certain changes in equity that are excluded from net loss. Comprehensive loss has been disclosed in the accompanying consolidated statements of operations and comprehensive loss and equals the Company's net loss for all periods presented.

Subsequent Events

The Company considers events or transactions that occur after the balance sheet date but prior to the issuance of the financial statements to provide additional evidence relative to certain estimates or to identify matters that require additional disclosure. See Note 15.

Recently Adopted Accounting Pronouncements

From time to time, new accounting pronouncements are issued by the FASB or other standard setting bodies and adopted by the Company as of the specified effective date. Unless otherwise discussed, the Company believes that the

impact of

recently issued standards that are not yet effective will not have a material impact on its financial position or results of operations upon adoption.

3. Property and Equipment, Net

Property and equipment, net, consists of the following (in thousands):

	December 31,	
	2014	2013
Computer equipment and software	$956	$921
Office equipment	213	205
Laboratory equipment	11,311	12,334
Leasehold improvements	9,930	9,930
Construction in progress	11	—
Total property and equipment	22,421	23,390
Accumulated depreciation and amortization	(19,334)	(19,685)
Property and equipment, net	$3,087	$3,705

Depreciation and amortization expense was $1.1 million, $0.9 million and $1.3 million for the years ending December 31, 2014, 2013 and 2012 respectively.

4. Restricted Cash

As of December 31, 2014, and 2013, the Company maintained letters of credit totaling $0.9 million held in the form of a certificates of deposit as collateral for the Company's facility lease obligations and its credit cards.

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5. Accrued Expenses

Accrued expenses consist of the following (in thousands):

	December 31,	
	2014	2013
Research and development related	2,291	1,330
Employee compensation	3,050	2,930
Professional services	426	1,017
Other	1,081	1,650
	$6,848	$6,927

6. Warrants

Below is a summary of the number of shares issuable upon exercise of outstanding warrants and the terms and accounting treatment for the outstanding warrants (in thousands, except per share data):

	Warrants as of December 31,		2014 Weighted-Average Exercise Price Per Share	Expiration	Balance Sheet Classification	
	2014	2013			December 31, 2014	December 31, 2013
Warrants to purchase Common Stock	—	46	$10.92	June 25, 2019	Equity(1) (2)	Equity(1) (2)
Warrants to purchase Common Stock	—	64	12.56	March 18, 2020	Equity(3) (4) (5)	Equity(3) (4) (5)
Warrants to purchase Common Stock	409	857	5.88	June 10, 2020 - July 9, 2020	Liability(6) (7) (8) (9) (10) (11) (12)	Liability(6) (7) (8) (9) (10) (11) (12)
Warrants to purchase Common Stock	13	13	4.00 - 7.40	March 31, 2015 - December 31, 2017	Equity(13)	Equity(13)
All warrants	422	980	$5.85			

(1) In March 2014, the warrant holders exercised warrants to purchase 32,050 shares of Common Stock on a net basis, resulting in the issuance of 22,955 shares of Common Stock.

(2) In December 2014, the warrant holders exercised warrants to purchase 13,736 shares of Common Stock on a net basis, resulting in the issuance of 10,284 shares of Common Stock.

(3) In March 2014, the warrant holders exercised warrants to purchase 12,738 shares of Common Stock on a net basis, resulting in the issuance of 9,202 shares of Common Stock.

(4) In April 2014, the warrant holders exercised warrants to purchase 31,847 shares of common stock on a net basis, resulting in the issuance of 21,082 shares of Common Stock.

(5) In December 2014, the warrant holders exercised warrants to purchase 19,108 shares of Common Stock on a net basis, resulting in the issuance of 13,585 shares of Common Stock.

(6) In March 2014, the warrant holders exercised warrants to purchase 543 shares of Common Stock on a net basis, resulting in the issuance of 456 shares of Common Stock.

(7) In March 2014, the warrant holders exercised warrants to purchase 23,445 shares of Common Stock on a cash basis, resulting in the issuance of 23,445 shares of Common Stock.

(8) In May and June 2014, the warrant holders exercised warrants to purchase 114,103 shares of common stock on a net basis, resulting in the issuance of 92,173 shares of Common Stock.

(9) In April 2014, the warrant holders exercised warrants to purchase 16,956 shares of common stock on a cash basis, resulting in the issuance of 16,956 shares of Common Stock.

(10) In August 2014, the warrant holders exercised warrants to purchase 11,611 shares of common stock on a net basis, resulting in the issuance of 9,332 shares of Common Stock.

(11) In September 2014, the warrant holders exercised warrants to purchase 126,283 shares of common stock on a cash basis, resulting in the issuance of 126,283 shares of Common Stock.

(12) In October 2014, the warrant holders exercised warrants to purchase 155,171 shares of Common Stock on a net basis, resulting in the issuance of 124,135 shares of Common Stock.

(13) Warrants to purchase common stock were issued in connection with various debt financing transactions that were consummated in periods prior to December 31, 2012. See discussion below for further details.

In connection with various financing transactions that were consummated in periods prior to December 31, 2013, the Company issued warrants for the purchase of up to 106,500 shares of the Company's Series A redeemable convertible preferred stock (Series A Preferred Stock), 31,891 shares of the Company's Series B redeemable convertible preferred stock (Series B Preferred Stock), 45,786 shares of the Company's Series C-1 redeemable convertible preferred stock (Series C-1 Preferred Stock), and 63,693 shares of the Company's Series D-1 redeemable convertible preferred stock (Series D-1 Preferred Stock). Each warrant was immediately exercisable. The warrants to purchase Series A and Series B Preferred Stock expire seven years from the original date of issuance, while the warrants to purchase Series C-1 and Series D-1 Preferred Stock expire ten years from the original date of issuance. The warrants to purchase shares of the Company's preferred stock have an exercise price equal to the original issuance price of the underlying instrument. Each warrant is exercisable on either a physical settlement or net share settlement basis and the redemption provisions are outside the control of the Company. In connection with the closing of the Company's IPO on September 24, 2013, the outstanding warrants to purchase Series B Preferred Stock, Series C-1 Preferred Stock, and Series D-1 Preferred Stock were converted into warrants to purchase common stock. The exercise prices for each of these warrants remained unchanged.

The Company follows the provisions of ASC Topic 480, Issuer's Accounting for Freestanding Warrants and Other Similar Instruments on Shares that Are Redeemable, which requires that warrants to purchase redeemable preferred stock be classified as liabilities. In addition, the value of the warrants is remeasured to the then-current fair value at each reporting date. Changes in fair value are recorded to other income (expense), net. For the years ended December 31, 2013 and 2012, the Company remeasured the fair value of all of its outstanding warrants to purchase shares of the Company's preferred stock up until the conversion of such warrants on September 24, 2013, using current assumptions, resulting in an increase in fair value of zero, $1.3 million and $0.4 million, respectively, which was recorded in other expense net in the accompanying consolidated statements of operations and comprehensive loss. As a result of the closing of the IPO and the resulting conversion of the warrants to purchase preferred shares into warrants to purchase common stock, the fair value of the warrant liability at September 24, 2013 was reclassified to permanent equity and therefore, is no longer subject to remeasurement.

In December 2012, the Company modified the warrant to purchase 106,500 shares of Series A Preferred Stock and extended the expiration date from December 21, 2012 to February 28, 2013. During the year ended December 31, 2013, the holder of the warrant exercised the warrant on a net basis, resulting in the issuance of 46,668 shares of Series A Preferred Stock. Upon exercise, the Company re-measured the fair value of the warrant and recorded the resulting increase in fair value of $0.1 million as other expense in the accompanying statement of operations and comprehensive loss for the year ended December 31, 2013.

In connection with the Series E redeemable convertible preferred stock (Series E Preferred Stock) financing transactions that took place in June 2010 and July 2010, the Company issued warrants to purchase up to 871,580 shares of common stock. Each warrant was immediately exercisable and expires ten years from the original date of issuance. The warrants to purchase shares of the Company's common stock have an exercise price equal to the estimated fair value of the underlying instrument as of the initial date such warrants were issued. Each warrant is exercisable on either a physical settlement or net share settlement basis from the date of issuance. The warrant agreement contains a provision requiring an adjustment to the number of shares in the event the Company issues common stock, or securities convertible into or exercisable for common stock, at a price per share lower than the warrant exercise price. The Company concluded the anti-dilution feature required the warrants to be classified as

liabilities under ASC Topic 815, Derivatives and Hedging—Contracts in Entity's Own Equity (ASC 815). The warrants are measured at fair value, with changes in fair value recognized as a gain or loss to other income (expense) in the consolidated statements of operations and comprehensive loss for each reporting period thereafter. The fair value of the common stock warrants were recorded as a discount to the preferred stock issued of $3.0 million, and the preferred stock were being accreted to the redemption value. At the end of each reporting period, the Company remeasured the fair value of the outstanding warrants, using current assumptions, resulting in a (decrease) increase in fair value of $(5.0) million $26.9 million, and $1.9 million, respectively, which was recorded in other income (expense), net in the accompanying consolidated statements of operations and comprehensive loss for the years ended December 31, 2014, 2013 and 2012. The Company will continue to re-measure the fair value of the liability associated with the warrants to purchase common stock at the end of each reporting period until the earlier of the exercise or the expiration of the applicable warrants. On March 31, 2013, the Company retired 13,994 warrants to purchase common stock as a consequence of a repurchase of shares from an investor. All remaining outstanding warrants were fully vested and exercisable as of December 31, 2014.

In connection with various financing transactions that were consummated in periods prior to December 31, 2013, the Company issued warrants to purchase up to 12,634 shares of common stock. The awards of warrants to purchase shares of common stock are accounted for as equity instruments. The warrants are exercisable at any time through their respective expiration dates. The fair value at issuance was calculated using the Black-Scholes option-pricing model, and was charged to interest expense during the periods the related debt was outstanding.

Fair Value

The fair value of the warrants to purchase preferred stock on the date of issuance and on each re-measurement date was estimated using the Black-Scholes option pricing model. This method of valuation involves using inputs such as the fair value of the Company's various classes of preferred stock and common stock, stock price volatility, contractual term of the warrants, risk free interest rates, and dividend yields. The fair value of the warrants to purchase common stock on the date of issuance and on each re-measurement date for those warrants to purchase common stock classified as liabilities was estimated using either the Monte Carlo simulation framework, which incorporates future financing events over the remaining life of the warrants to purchase common stock, or for certain re-measurement dates including December 31, 2013 and 2014, due to the warrants being deeply in the money, the Black-Scholes option pricing model was used. At each reporting period the company evaluates the best valuation methodology.

The fair value of each warrant to purchase shares of the Company's Series A Preferred Stock was estimated using the Black-Scholes option pricing model with the following assumptions:

	Year Ended December 31,			
	2014	2013(2)	2012(1)	
Fair value of underlying instrument	n/a	n/a	$9.24	
Expected volatility	n/a	n/a	69.1	%
Expected term (in years)	n/a	n/a	0.16	
Risk-free interest rate	n/a	n/a	0.04	%
Expected dividend yield	n/a	n/a	—	%

(1) During December 2012, the expiration date of the warrant to purchase Series A Preferred Stock was extended from December 21, 2012 to February 28, 2013.

(2) The warrant to purchase Series A Preferred Stock was exercised during the three months ended March 31, 2013.

The fair value of each warrant to purchase shares of the Company's Series B Preferred Stock was estimated using the Black-Scholes option pricing model with the following assumptions:

	Year Ended December 31,				
	2014	2013(1)		2012	
Fair value of underlying instrument	n/a	$20.03		$9.96	
Expected volatility	n/a	71.2	%	69.1	%
Expected term (in years)	n/a	0.24		0.97	
Risk-free interest rate	n/a	0.04	%	0.16	%
Expected dividend yield	n/a	—	%	—	%

(1) Warrants to purchase Series B Preferred Stock were converted to warrants to purchase common stock at the closing of the IPO on September 24, 2013.

The fair value of each warrant to purchase shares of the Company's Series C-1 Preferred Stock was estimated using the Black-Scholes option pricing model with the following assumptions:

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Years Ended December 31, 2014, 2013 and 2012

	Year Ended December 31,				
	2014	2013(1)		2012	
Fair value of underlying instrument	n/a	$20.03		$11.04	
Expected volatility	n/a	71.2	%	69.1	%
Expected term (in years)	n/a	5.73		6.46	
Risk-free interest rate	n/a	1.75	%	0.95	%
Expected dividend yield	n/a	—	%	—	%

(1) Warrants to purchase Series C-1 Preferred Stock were converted to warrants to purchase common stock at the closing of the IPO on September 24, 2013.

The fair value of each warrant to purchase shares of the Company's Series D-1 Preferred Stock was estimated using the Black-Scholes option pricing model with the following assumptions:

	Year Ended December 31,				
	2014	2013(1)		2012	
Fair value of underlying instrument	n/a	$20.03		$10.52	
Expected volatility	n/a	71.2	%	69.1	%
Expected term (in years)	n/a	6.48		7.22	
Risk-free interest rate	n/a	1.75	%	1.18	%
Expected dividend yield	n/a	—	%	—	%

(1) Warrants to purchase Series D-1 Preferred Stock were converted to warrants to purchase common stock at the closing of the IPO on September 24, 2013.

Fair Value of Underlying Instrument

The Company estimated the fair value of its shares of Series A Preferred Stock, Series B-1 Preferred Stock, Series C-1 Preferred Stock and Series D-1 Preferred Stock as of December 31, 2012 and through the exercise or conversion of its Preferred stock warrants during 2013, using the PWERM (probability-weighted expected return method).

Expected Volatility

The Company estimated the expected volatility based on actual historical volatility of the stock price of similar companies with publicly-traded equity securities. The Company calculated the historical volatility of the selected companies by using daily closing prices over a period of the expected term of the associated award. The companies were selected based on their enterprise value, risk profiles, position within the industry, and with historical share price information sufficient to meet the expected term of the associated award. A decrease in the selected volatility would decrease the fair value of the underlying instrument.

Expected Term

The Company based the expected term on the actual remaining contractual term of each respective warrant. A decrease in the expected term would decrease the fair value of the underlying instrument.

Risk-Free Interest Rate

The Company estimated the risk-free interest rate in reference to the yield on U.S. Treasury securities with a maturity date commensurate with the expected term of the associated award. A decrease in the selected risk-free rate would decrease the fair value of the underlying instrument.

Expected Dividend Yield

The Company estimated the expected dividend yield based on consideration of its historical dividend experience and future dividend expectations. The Company has not historically declared or paid dividends to stockholders. Moreover, it does not intend to pay dividends in the future, but instead expects to retain any earnings to invest in the continued growth of the business. Accordingly, the Company assumed an expected dividend yield of 0.0%.

7. Commitments and Contingencies

Operating Leases

The Company leases its facilities under non-cancelable operating leases that expire at various dates through May 2018. All of the Company's leases contain escalating rent clauses, which require higher rent payments in future years. The Company expenses rent on a straight-line basis over the term of the lease, including any rent-free periods. In addition, the Company received certain leasehold improvement incentives, and recorded these incentives as deferred rent, which is amortized as a reduction of rent expense over the life of the lease. Rent expense of approximately $3.3 million, $3.5 million and $3.5 million and were incurred during the years ended December 31, 2014, 2013 and 2012, respectively.

Future annual minimum lease payments as of December 31, 2014, are as follows (in thousands):

2015	4,106
2016	3,938
2017	3,938
2018	2,954
Total	$14,936

In February 2011, the Company entered into a sublease agreement for a portion of one of its facility leases. The tenant will pay rent on the lease from February 28, 2011 until May 30, 2015. On December 31, 2013, the sublease agreement was expanded to include the remaining space of that facility. The expansion portion was leased for 1 year, through December 31, 2014.

Future annual minimum sublease proceeds expected as of December 31, 2014, are as follows (in thousands):

2015	241
Total	$241

Legal Proceedings

Except as discussed below, the Company, from time to time, may be party to litigation arising in the ordinary course of its business. The Company was not subject to any material legal proceedings during the years ended December 31, 2014, 2013 and 2012, and, to the best of its knowledge, no material legal proceedings are currently pending or threatened.

On October 18, 2012, the Salk Institute for Biological Studies (Salk) filed a complaint in the Massachusetts Superior Court for Suffolk County, alleging that the Company breached one of the Company's two licensing agreements with Salk. The licensing agreement in dispute provides the Company with a license with respect to certain of Salk’s U.S. patents related to the ActRIIB activin receptor proteins. Salk contended that, under the licensing agreement, the Company owed Salk a greater share of the upfront payment that it received under its now-terminated agreement with Shire AG regarding ACE-031 and a share of the upfront payment and development milestone payments that the Company has received under its ongoing collaboration agreement with Celgene regarding luspatercept. Salk was seeking a total of approximately $10.5 million plus interest and a 15% share of future development milestone payments received under the agreement with Celgene regarding luspatercept. The Company contended that no additional amounts were due to Salk and that it had complied with all of its payment obligations under the applicable Salk license agreement.

The Company moved to dismiss the complaint on December 3, 2012. The Court denied the Company’s motion on February 28, 2013. On March 14, 2013, Acceleron answered the complaint and asserted patent invalidity

counterclaims. On the basis of those counterclaims, Acceleron removed the action on March 28, 2013 to the United States District Court for the

District of Massachusetts. The parties reached an agreement on a stipulation as to certain patent issues raised in the action, and the Company dismissed its counterclaims. The Court held an initial scheduling conference on May 30, 2013, and the fact discovery was closed.

On July 25, 2014, the Company and the Salk Institute for Biological Studies entered into an amendment (the Amendment) to that certain Exclusive License Agreement between Salk and the Company regarding Activin Receptors (Type IIB) and Related Subject Matter for Therapeutic and Diagnostic Purposes, dated August 11, 2010 (the License Agreement). The License Agreement provides the Company with a license with respect to certain of Salk's U.S. patents related to the ActRIIB activin receptor proteins.

The Amendment was entered into as a condition to the settlement with Salk that provides for the release of all claims in the lawsuit. Pursuant to the settlement, the Company has made a one-time total payment of $5.0 million, inclusive of interest, to Salk and the Company has agreed to pay Salk 6% of future development milestone payments received under the agreement with Celgene relating to luspatercept. Finally, the Company and Salk have further agreed that the royalty percentage on net sales of luspatercept will remain at 1% as provided in the original license agreement with Salk, and that such royalty will be payable until June 2022.

The Company recorded the impact of the settlement as a charge to operations in the accompanying consolidated statement of operations and comprehensive loss for the year ended December 31, 2014.

Other

The Company is also party to various agreements, principally relating to licensed technology, that require future payments relating to milestones not met at December 31, 2014 and 2013, or royalties on future sales of specified products. No milestone or royalty payments under these agreements are expected to be payable in the immediate future. See Note 9 for discussion of these arrangements.

The Company enters into standard indemnification agreements in the ordinary course of business. Pursuant to the agreements, the Company indemnifies, holds harmless, and agrees to reimburse the indemnified party for losses suffered or incurred by the indemnified party, generally the Company's business partners or customers, in connection with any U.S. patent or any copyright or other intellectual property infringement claim by any third party with respect to the Company's products. The term of these indemnification agreements is generally perpetual any time after execution of the agreement. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is unlimited. The Company has never incurred costs to defend lawsuits or settle claims related to these indemnification agreements.

8. Redeemable Convertible Preferred Stock and Stockholders' Equity

As of December 31, 2012, the authorized capital stock of the Company was 104,013,161 shares of common stock, par value $0.001 per share and 74,077,227 shares of preferred stock, par value $0.001 per share, of which: (1) 26,069,980 shares have been designated as Series A Preferred Stock, (2) 16,944,378 shares have been designated as Series B Preferred Stock, (3) 11,923,077 shares have been designated as Series C redeemable convertible (Series C Preferred Stock), (4) 2,014,652 shares have been designated as Series C-1 Preferred Stock, (5) 955,414 shares have been designated as Series D redeemable convertible preferred stock (Series D Preferred Stock), (6) 2,802,548 shares have been designated as Series D-1 Preferred Stock, (7) 3,662,422 shares have been designated as Series E Preferred Stock, and (8) 9,704,756 shares have been designated as Series F redeemable convertible preferred stock (Series F Preferred Stock, and all collectively the Preferred Stock).

On September 4, 2013, the Board and the stockholders of the Company approved a one-for-four reverse stock split of the Company's outstanding common stock, which was effected on September 5, 2013. Stockholders entitled to fractional shares as a result of the reverse stock split received a cash payment in lieu of receiving fractional shares.

The Company's historical share and per share information have been retroactively adjusted to give effect to this reverse stock split. Shares of common stock underlying outstanding stock options and other equity instruments were proportionately reduced and the respective exercise prices, if applicable, were proportionately increased in accordance with the terms of the agreements governing such securities.

On September 4, 2013, the Board also approved for filing immediately following the effectiveness of the Company's registration statement in connection with its IPO, the Restated Certificate of Incorporation to increase the authorized number of shares of common stock from 104,013,161 to 175,000,000, to authorize 25,000,000 shares of undesignated preferred stock, par

value $0.001 per share, and to eliminate all references to the previously designated Series Preferred Stock. This Restated Certificate of Incorporation was approved by the stockholders on September 4, 2013.

On September 24, 2013, the Company completed its IPO whereby the Company sold 6,417,000 shares of common stock (including 837,000 shares of common stock sold by the Company pursuant to the full exercise of an overallotment option by the underwriters in connection with the offering) at a price of $15.00 per share. The shares began trading on The Nasdaq Global Market on September 19, 2013. The aggregate net proceeds received by the Company from the offering were $86.8 million, net of underwriting discounts and commissions and estimated offering expenses payable by the Company. Upon the closing of the IPO, all outstanding shares of convertible preferred stock converted into 18,516,993 shares of common stock and warrants exercisable for convertible preferred stock were automatically converted into warrants exercisable for 141,370 shares of common stock, resulting in the reclassification of the related convertible preferred stock warrant liability of $2.0 million to additional paid-in capital.

On September 24, 2013, the Company also completed the sale of a private placement of 666,667 shares of common stock to Celgene Corporation at the IPO price of $15.00 per share concurrent with and at the same offer price as the IPO. The aggregate net proceeds received by the Company from the concurrent private placement were $10.0 million.

On January 28, 2014, the Company completed its underwritten public offering of 2,760,000 shares of common stock, including 360,000 shares of common stock issued upon the exercise in full by the underwriters of their option to purchase additional shares, at a public offering price of $50.00 per share. The aggregate net proceeds received by the Company, after underwriting discounts and commissions and other estimated offering expenses, were $129.2 million.

Redeemable Convertible Preferred Stock

Prior to the closing of the initial public offering, at which time all shares of Preferred Stock were converted into shares of common stock, the Company's Preferred Stock consisted of the following (in thousands, except share and per share data):

	December 31, 2012
Series A Preferred Stock, $0.001 par value: 26,069,980 shares authorized, 6,410,976 shares issued and outstanding at December 31, 2012, at redemption value	$66,665
Series B Preferred Stock, $0.001 par value: 16,944,378 shares authorized, 4,204,185 shares issued and outstanding at December 31, 2012, at redemption value	67,044
Series C Preferred Stock, $0.001 par value: 11,923,077 shares authorized, 2,978,062 shares issued, and outstanding at December 31, 2012, at redemption value	59,909
Series C-1 Preferred Stock, $0.001 par value: 2,014,652 shares authorized, 457,875 issued, and outstanding at December 31, 2012, at redemption value	9,387
Series D Preferred Stock, $0.001 par value: 955,414 shares authorized, 234,940 shares issued, and outstanding at December 31, 2012, at redemption value	4,325
Series D-1 Preferred Stock, $0.001 par value: 2,802,548 shares authorized, 636,942 issued and outstanding at December 31, 2012, at redemption value	11,864
Series E Preferred Stock, $0.001 par value: 3,662,422 shares authorized, 816,060 shares issued and outstanding at December 31, 2012, at redemption value	13,393
Series F Preferred Stock, $0.001 par value: 9,704,756 shares authorized, 2,426,171 issued and outstanding at December 31, 2012, at redemption value	36,023
Total redeemable convertible preferred stock	$268,610

The holders of the Company's Preferred Stock had certain voting, dividend, and redemption rights, as well as liquidation preferences and conversion privileges. All rights, preferences, and privileges associated with the Preferred Stock were terminated at the time of the Company's IPO in conjunction with the conversion of all outstanding shares of Preferred Stock into shares of common stock.

Common Stock

The holders of shares of common stock are entitled to one vote for each share of common stock held at all meetings of stockholders and written actions in lieu of meetings.

The holders of shares of common stock are entitled to receive dividends, if and when declared by the Board. No dividends have been declared or paid by the Company through December 31, 2014.

Common Stock Reserved for Future Issuance

At December 31, 2014, the Company has reserved for future issuance the following number of shares of common stock (in thousands):

	December 31, 2014
Outstanding stock options to purchase common stock	3,210
Shares available for future issuance under stock option plan	1,943
Warrants to purchase common stock	422
Shares available for future issuance under the employee stock purchase plan	275
Additional shares reserved for unissued, but designated, Preferred Stock	25,000
Total shares of authorized common stock reserved for future issuance	30,850

9. Significant Agreements

Celgene

Overview

On February 20, 2008 the Company entered into a collaboration, license, and option agreement (the Sotatercept Agreement) with Celgene Corporation (Celgene) relating to sotatercept. On August 2, 2011, the Company entered into a second collaboration, license and option agreement with Celgene for luspatercept (the Luspatercept Agreement), and also amended certain terms of the Sotatercept Agreement. These agreements provide Celgene exclusive licenses for sotatercept and luspatercept in all indications, as well as exclusive rights to obtain a license to certain future compounds. Celgene is a global biopharmaceutical company primarily engaged in the discovery, development and commercialization of innovative therapies designed to treat cancer and immune-inflammatory related diseases.

Sotatercept Agreement

Under the terms of the Sotatercept Agreement, the Company and Celgene collaborate worldwide for the joint development and commercialization of sotatercept. The Company also granted Celgene an option to license three discovery stage compounds. Under the terms of the agreement, the Company and Celgene will jointly develop, manufacture and commercialize sotatercept. Celgene paid $45.0 million of nonrefundable, upfront license and option payments to the Company upon the closing of the Sotatercept Agreement.

The Company retained responsibility for research and development through the end of Phase 2a clinical trials, as well as manufacturing the clinical supplies for these trials. These activities were substantially completed in 2011. Celgene is conducting the ongoing Phase 2 trials for myelodysplastic syndromes (MDS), chronic kidney disease, and ß-thalassemia and will be responsible for any Phase 3 clinical trials, as well as additional Phase 2 clinical trials, and will be responsible for overseeing the manufacture of Phase 3 and commercial supplies by third-party contract manufacturing organizations. Under the agreement, the Company was eligible to receive clinical milestones of up to $88.0 million, regulatory milestones of up to $272.0 million, and commercial milestones of up to $150.0 million for sotatercept. Clinical milestone payments are triggered upon initiation of a defined phase of clinical research for a therapeutic candidate. Regulatory milestone payments are triggered upon the acceptance of the marketing application and upon the approval to market a therapeutic candidate by the Food and Drug Administration (FDA) or other global regulatory authorities. Commercial milestone payments are triggered when an approved pharmaceutical product reaches certain defined levels of net sales by Celgene in countries outside of North America. In addition, to the extent sotatercept is commercialized, the Company would be entitled to receive tiered royalty payments in the low-to-mid twenty percent range of net sales from sales generated from all geographies. Royalty payments are subject to certain reductions, including for entry of a generic product onto the market.

Additionally, for three named discovery-stage option programs the Company was eligible to receive option fees of up to $30.0 million, clinical milestones of up to $53.3 million, regulatory milestones of up to $204.0 million, and commercial

milestones of up to $150.0 million for each option program. Clinical milestone payments are triggered upon initiation of a defined phase of clinical research for a therapeutic candidate. Regulatory milestone payments are triggered upon the acceptance of the marketing application and upon the approval to market a therapeutic candidate by the FDA or other global regulatory authorities. Commercial milestone payments are triggered when an approved pharmaceutical product reaches certain defined levels of net sales by Celgene in countries outside of North America. Option fee payments are triggered upon license of any of the option programs by Celgene. In addition, to the extent an option compound is commercialized, the Company would be entitled to receive tiered royalty payments in the low-to-mid twenty percent range of net sales from sales generated from all geographies. Royalty payments are subject to certain reductions, including for entry of a generic product onto the market. None of the three discovery stage programs has advanced to the stage to achieve payment of a milestone.

In connection with entering into the Sotatercept Agreement, Celgene purchased 457,875 shares of Series C-1 Preferred Stock at the aggregate purchase price of $5.0 million. The Series C-1 Preferred Stock was purchased at an amount that was deemed to represent fair value at the time of purchase. Per our agreement and concurrent with the IPO, Celgene purchased 666,667 shares of Common Stock at the IPO offer price of $15.00 per share for $10.0 million.

Commensurate with the execution of the Luspatercept Agreement described below, the Company and Celgene agreed to modify the terms of the Sotatercept Agreement. The modified terms included: (1) a change to the responsibility for development costs to align with the Luspatercept Agreement, with Celgene responsible for more than half of the worldwide costs through December 31, 2012, and 100% of the development costs thereafter, (2) future contingent development milestones for sotatercept were amended to a two-category (oncology and non-oncology) structure with potential future clinical milestones of $27.0 million and regulatory milestones of $190.0 million from a four-category (various cancer indications) structure and, (3) future contingent development milestones for option compounds were amended to a two-category (oncology and non-oncology) structure with potential future clinical milestones of $25.5 million and regulatory milestones of $142.5 million from a four-category (various cancer indications) structure, and (4) an option to buy down tiered royalty payments on both sotatercept and luspatercept with a one-time $25.0 million payment on or prior to January 1, 2013. The potential commercial milestones remained unchanged. To date, the Company has received $42.3 million in research and development funding and milestone payments for sotatercept under the original and modified agreements, of which $7.0 million is a clinical milestone payment earned in December 2013 that resulted from Celgene's start of a Phase 2b clinical trial in chronic kidney disease. The next likely clinical milestone payment would be $10.0 million and result from Celgene's start of a Phase 3 study in MDS or chronic kidney disease.

The Sotatercept Agreement will expire on a country-by-country basis on the occurrence of both of the following: (1) the expiration of the royalty term with respect to all license products in such country, and (2) the exercise or forfeiture by Celgene of its option with regard to each option compound. The royalty term for each licensed product in each country outside North America is the period commencing with first commercial sale of the applicable licensed product in the applicable country and ending on the latest of expiration of specified patent coverage or a specified period of years. The royalty term for each licensed product in North America is the period commencing with the first commercial sale in North America and ending, on a licensed product and country-by-country basis on the date which commercialization of such licensed product has ceased. The term for each option compound runs for a specified period of years unless Celgene exercises its option, in which case the compound becomes a licensed product, or forfeits its option by failing to make certain payments following the achievement of certain milestones in early clinical development of the option compound.

Celgene has the right to terminate the agreement with respect to one or more licensed targets or in its entirety, upon 180 days' notice (or 45 days' notice if the licensed product has failed to meet certain end point criteria with respect to clinical trials or other development activities). The agreement may also be terminated in its entirety by either Celgene

or the Company in the event of a material breach by the other party or in the event of a bankruptcy filing of the other party. There are no cancellation, termination or refund provisions in this arrangement that contain material financial consequences to the Company.

Luspatercept Agreement

Under the terms of the Luspatercept Agreement, the Company and Celgene collaborate worldwide for the joint development and commercialization of luspatercept. The Company also granted Celgene an option for future products for which Acceleron files an Investigational New Drug application for the treatment of anemia. Celgene paid $25.0 million on the closing of the Luspatercept Agreement in August, 2011.

The Company retains responsibility for research and development through the end of Phase 1 and initial Phase 2 clinical trials, as well as manufacturing the clinical supplies for these studies. Celgene will conduct subsequent Phase 2 and Phase 3 clinical studies. Acceleron will manufacture luspatercept for the Phase 1 and Phase 2 clinical trials and Celgene will be

responsible for overseeing the manufacture of Phase 3 and commercial supplies by third party contract manufacturing organizations. The Company is eligible to receive clinical milestones of up to $32.5 million, regulatory milestones of up to $105.0 million and commercial milestones of up to $80.0 million for luspatercept. The Company will receive additional, lower development, regulatory, and commercial milestones for any additional products for the treatment of anemia on which Celgene exercises an option. Clinical milestone payments are triggered upon initiation of a defined phase of clinical research for a therapeutic candidate. Regulatory milestone payments are triggered upon the acceptance of the marketing application and upon approval to market a therapeutic candidate by the FDA or other global regulatory authorities. Commercial milestone payments are triggered when an approved pharmaceutical product reaches certain defined levels of net sales by Celgene in countries outside of North America. In addition, to the extent luspatercept is commercialized, the Company would be entitled to receive tiered royalty payments in the low-to-mid twenty percent range of net sales from sales generated from all geographies. Royalty payments are subject to certain reductions, including for entry of a generic product onto the market.

Through December 31, 2014, the Company has received $44.4 million in research and development funding and milestone payments for luspatercept. The next likely clinical milestone payment would be $15.0 million and result from the start of a Phase 3 study in MDS or ß-thalassemia. The Company has not yet identified additional compounds for the treatment of anemia. Accordingly, there is no assurance that the Company will generate future value from additional programs.

The Luspatercept Agreement will expire on a country-by-country basis on the occurrence of both of the following: (1) the expiration of the royalty term with respect to all license products in such country, and (2) the end of the option term. The royalty term for each licensed product in each country outside North America is the period commencing with first commercial sale of the applicable licensed product in the applicable country and ending on the latest of expiration of specified patent coverage or a specified period of years. The royalty term for each licensed product in North America is the period commencing with the first commercial sale in North America and ending, on a licensed product and country-by-country basis on the date which commercialization of such licensed product has ceased. The option term runs until the later of (1) the date on which no development or commercialization activities are ongoing or are expected to commence for any licensed products under the Luspatercept Agreement; (2) the date on which no development or commercialization activities are ongoing or are expected to commence for any licensed products under the Sotatercept Agreement and all option rights under the Sotatercept Agreement have been forfeited with respect to each option compound where Celgene has made a payment with respect to such compound; and (3) the royalty term for all licensed products under the Luspatercept Agreement and the Sotatercept Agreement has ended; provided that if at the time the option term would otherwise end any option compounds under the Luspatercept Agreement are in clinical development the option term shall continue until Celgene's rights to such compound are either exercised or forfeited.

Celgene has the right to terminate the Luspatercept Agreement with respect to one or more licensed targets or in its entirety, upon 180 days' notice (or 45 days' notice if the licensed product has failed to meet certain end point criteria with respect to clinical trials or other development activities), provided that Celgene may not terminate the Luspatercept Agreement prior to the completion of the on-going luspatercept -thalassemia and luspatercept MDS Phase 2 clinical trials, except under certain conditions. The agreement may also be terminated in its entirety by either Celgene or the Company in the event of a material breach by the other party or in the event of a bankruptcy filing of the other party. There are no cancellation, termination or refund provisions in this arrangement that contain material financial consequences to the Company.

Both Agreements

The Company and Celgene shared development costs under the Sotatercept and Luspatercept Agreements through December 31, 2012. As of January 1, 2013, Celgene has been responsible for paying 100% of worldwide development costs under both agreements. Celgene will be responsible for all commercialization costs worldwide. The Company

has the right to co-promote sotatercept, luspatercept and future products under both agreements in North America. Celgene's option to buy down royalty rates for sotatercept and luspatercept expired unexercised and, therefore, the Company will receive tiered royalties in the low-to-mid twenty percent range on net sales of sotatercept and luspatercept. The royalty schedules for sotatercept and luspatercept are the same.

Accounting Analysis

Prior to 2011, the Company accounted for the Sotatercept Agreement, as a multiple element arrangement under ASC 605-25 (prior to the amendments of ASU 2009-13). The Company identified the following deliverables under the arrangement; (1)the license to the ActRIIA compound, (2) right to license option program compounds, (3) participation in the joint development committee, (4) participation in the joint commercialization committee and (5) research and development activities. Under the provisions of ASC 605-25, applicable to the arrangement, since the Company could not establish vendor-specific objective evidence (VSOE) for the undelivered elements, the Company was required to recognize the initial consideration,

consisting of the $45.0 million of nonrefundable upfront license and option payments, over the period the undelivered elements were to be delivered, which was initially estimated to be 15 years. As of the date of the modification of the agreement, there was approximately $34.7 million of deferred revenue under the arrangement.

As a result of the material modifications to the cost sharing obligations, milestone payments structure and royalty payment structure, the Company concluded the modification represented a significant modification under ASU 2009-13, which required the Company to apply the updated provisions of ASU 2009-13 subsequent to the modification.

Because the Luspatercept Agreement and the amendment to the Sotatercept Agreement were negotiated in contemplation of each other, and the Company had not yet completed all of its obligations pursuant to the Sotatercept Agreement, the agreements were considered one arrangement for accounting purposes. The deliverables under the combined arrangement include: (1) licenses to develop and commercialize sotatercept and luspatercept, (2) performance of research and development services, (3) participation on the joint development committees, and (4) the performance of manufacturing services to provide clinical material to Celgene. The Company has determined the option to future products related to the treatment of anemia represents a substantive option. The Company is under no obligation to discover, develop or deliver any new compounds that modulate anemia and Celgene is not contractually obligated to exercise the option. As a result, the Company is at risk as to whether Celgene will exercise the option. All of these deliverables identified in the arrangement were deemed to have stand-alone value and to meet the criteria to be accounted for as separate units of accounting under ASC 605-25. Factors considered in making this determination included, among other things, the subject of the licenses, the nature of the research and development services, and the capabilities of Celgene.

The total arrangement consideration of $77.7 million under the Luspatercept Agreement and amended Sotatercept Agreement consisted of (1) the $25.0 million up-front payment for the license of luspatercept, (2) the remaining deferred revenue from the Sotatercept Agreement of $34.7 million, and (3) estimated payments for development activities and manufacturing services of $18.0 million. The Company used its best estimate of selling price (BESP) for each of the undelivered elements as the Company did not have VSOE or (third-party evidence) TPE of selling price for each deliverable. The Company's BESP considered its development plan for the compounds, expected manufacturing services, and reimbursement from Celgene (reimbursement of more than half of development expenses through December 31, 2012 and 100% thereafter). The Company determined its BESP for each of the undelivered elements under the arrangements as of the arrangement execution date as follows:

- $18.8 million for research and development services
- $2.9 million for the sotatercept joint development committee
- $3.7 million for the ACE 536 joint development committee
- $2.8 million for the manufacturing services

After determining the BESP of the undelivered elements, the remaining consideration of $49.5 million was recognized upon execution of the arrangements. The difference between the estimated payments of $18.0 million and the estimated selling prices which totaled $28.2 million, using BESP, for undelivered elements was $10.2 million. This amount was deferred at inception and will be recognized as the undelivered elements are delivered, using the proportional performance method, or ratably in the case of performance on the Joint Development Committee.

As noted above, the total arrangement consideration includes estimated payments for development activities and manufacturing services identified at the outset of the Luspatercept Agreement and amended Sotatercept Agreement. At the end of each reporting period, the Company reassesses the estimated payments to be received related to these services and the BESP of the undelivered elements based upon the Company's current estimates. The Company accounts for such changes as a change in accounting estimate and the cumulative impact of any change is reflected in the period of change.

During 2011, the Company achieved a $7.5 million clinical milestone under its Luspatercept Agreement, related to the dosing of the first patient in a multiple-dose clinical trial. The Company evaluated the milestone and determined that it was not substantive, as there was no significant uncertainty to achieving the milestone upon execution of the Luspatercept Agreement. As such, the Company allocated the $7.5 million payment based on the allocation of arrangement consideration determined at the execution date of the Luspatercept Agreement and amended Sotatercept Agreement. Based on this allocation, the Company recognized $4.8 million of the payment upon achievement, with the remaining $2.7 million recognized as revenue as the undelivered elements are delivered, consistent with the treatment of the up-front payment. During January 2013, the Company achieved a $10.0 million clinical milestone under its Luspatercept Agreement, related to the dosing of the first patient for a

Phase 2 clinical trial. The Company evaluated the milestone and deemed it to be substantive and consistent with the definition of a milestone included in ASU 2010-17 and, accordingly, recognized the $10.0 million payment in revenue during the year ended December 31, 2013. During December 2013, the Company achieved a $7.0 million clinical milestone under its Sotatercept Agreement, related to Celgene's start of a Phase 2b clinical trial in chronic kidney disease. The Company evaluated the milestone and deemed it to be substantive and consistent with the definition of a milestone included in ASU 2010-17 and, accordingly, recognized the $10.0 million payment in revenue during the year ended December 31, 2013.The remaining development milestones under the Luspatercept and Sotatercept Agreements were deemed to be substantive and consistent with the definition of a milestone included in ASU 2010-17 and, accordingly, the Company will recognize payments related to the achievement of such milestones, if any, when such milestone is achieved. Factors considered in this determination included scientific and regulatory risks that must be overcome to achieve the milestones, the level of effort and investment required to achieve each milestone, and the monetary value attributed to each milestone. During the years ended December 31, 2014, 2013 and 2012, the Company recognized $1.7 million, $2.6 million and $2.0 million, respectively, of the total deferred revenue as license and milestone revenue in the accompanying consolidated statements of operations and comprehensive loss.

As noted above, under the terms of the Luspatercept Agreement the Company retains responsibility for certain research and development activities through the completion of Phase 1 and initial Phase 2 clinical trials, as well as manufacturing the clinical supplies for these studies. Celgene is responsible for the conduct of subsequent Phase 2 and Phase 3 clinical studies. In November, 2013, the Company agreed to conduct additional activities for the benefit of the luspatercept program including certain clinical and non-clinical services such as multiple toxicology studies and associated assay development and sample testing, clinical extension studies, and market development work. These activities will be reimbursed under the same terms and rates of the existing Agreements. The Company evaluated the additional services to be provided and determined that as the Company is under no obligation to conduct these additional activities, these services do not represent a deliverable under or modification to the Luspatercept Agreement, but rather, represent a separate services arrangement which should be accounted for as the services are delivered.

Pursuant to the terms of the agreement, Celgene and the Company share development costs, with Celgene responsible for substantially more than half of the costs for sotatercept and luspatercept until December 31, 2012 and 100% of the costs from January 1, 2013 and thereafter. Payments from Celgene with respect to research and development costs incurred by the Company are recorded as cost-sharing revenue. Payments by the Company to Celgene for research and development costs incurred by Celgene are recorded as a reduction to cost-sharing revenue. During the years ended December 31, 2014, 2013 and 2012, the Company recorded net cost-sharing revenue of $13.0 million, $12.7 million and $2.9 million, respectively. During the year ended December 31, 2012, the Company recorded contra-revenue of $2.8 million for payments made to Celgene. There were no payments made to Celgene during the years ended December 31, 2014 and 2013.

Other Agreements

Shire License

In September 2010, the Company entered into a license and collaboration agreement granting Shire AG the exclusive right to develop, manufacture and commercialize ActRIIB compounds in territories outside North America. Shire also received the right to conduct research and manufacture commercial supplies in North America for ActRIIB compounds. The lead ActRIIB compound was designated ACE-31. Under the initial development plan, the companies share the costs associated with developing and commercializing ACE-31, in Duchenne Muscular Dystrophy. In September 2010, Shire made a nonrefundable, up-front license payment to the Company of $45.0 million. In accordance with the Company's revenue recognition policy prior to the adoption of ASU 2009-13, the up-front license payment of $45.0 million was deferred, and will be recognized as revenue ratably over three years, which represented the original period over which the Company expected to perform and deliver research and development and

manufacturing services. On February 8, 2011, the FDA placed ACE-31 on clinical hold. The Company re-assessed the duration of its deliverables under the license agreement and estimated the new term to be approximately five years. The adjustment was treated as a change in accounting estimate with the remaining deferred revenue of $38.8 million at February 8, 2011, recognized prospectively over the new period of research and development and manufacturing services. In April 2013, the Company and Shire determined not to further pursue development of ACE-31 and Shire sent the Company a notice of termination for the ACE-31 collaboration. The collaboration terminated effective June 30, 2013. Upon the effectiveness of the termination of the Shire Agreement in the second quarter of 2013, the Company accelerated the recognition of $22.4 million of remaining deferred revenue from upfront non-refundable payments received under the Shire Agreement as it had no further obligation for deliverables under the Shire Agreement. During the years ended December 31, 2013 and 2012, the Company recognized $24.3 million and $7.7 million, respectively, of the up-front, non-refundable payments

as license and milestone revenue in the accompanying consolidated statements of operations and comprehensive loss. No amounts were recognized subsequent to the June 30, 2013 termination.

The agreement also included contingent milestone payments, based on the achievement of development milestones totaling $223.8 million and commercial milestones of $228.8 million for ActRIIB compounds. The milestones under the Shire Agreement were deemed to be substantive and consistent with the definition of a milestone included in ASU 2010-17 and, accordingly, the Company recognized payments related to the achievement of such milestones, if any, when such milestone was achieved. Factors considered in this determination included scientific and regulatory risks that must be overcome to achieve the milestones, the level of effort and investment required to achieve each milestone, and the monetary value attributed to each milestone.

Pursuant to the terms of the agreement, Shire and the Company shared development costs, with Shire responsible for 65% of the costs for ACE-31 and 55% of the costs for licensed compounds other than ACE-31. Payments from Shire with respect to research and development costs incurred by the Company are recorded as cost-sharing revenue. Payments by the Company to Shire for research and development costs incurred by Shire are recorded as a reduction to cost-sharing revenue. During the years ended December 31, 2013 and 2012, the Company recorded net cost-sharing revenue of $0.6 million and $2.7 million, respectively, which includes payments to Shire of $0.2 million and $0.7 million, respectively, which are recorded as contra-revenue in the accompanying consolidated statements of operations and comprehensive loss. No amounts we recognized subsequent to the June 30, 2013 termination.

Other

In 2004, the Company entered into a license agreement with a non-profit institution for an exclusive, sublicensable, worldwide, royalty-bearing license to certain patents developed by the institution (Primary Licensed Products). In addition, the Company was granted a non-exclusive, non-sub-licensable license for Secondary Licensed Products. As compensation for the licenses, the Company issued 62,500 shares of its common stock to the institution, the fair value of which was $25,000, and was expensed during 2004, to research and development expense. The Company also agreed to pay specified development milestone payments totaling up to $2.0 million for sotatercept and $0.7 million for luspatercept. In addition, the Company is obligated to pay milestone fees based on the Company's research and development progress, and U.S. sublicensing revenue ranging from 10%-25%, as well as a royalty ranging from 1.0%-3.5% of net sales on any products developed under the licenses. During the years ended December 31, 2014, 2013 and 2012, the Company paid and expensed milestones and fees defined under the agreement totaling $0.1 million, $0.5 million, and $0, respectively, which is recorded as research and development expense.

In 2004, the Company entered into another license agreement with certain individuals for an exclusive, sublicensable, worldwide, royalty-bearing license to certain patents developed by the individuals. The Company agreed to pay specified development and sales milestone payments aggregating up to $1.0 million relating to the development and commercialization of dalantercept. In addition, the Company is required to pay royalties in the low single-digits on worldwide net product sales of dalantercept, with royalty obligations continuing at a 50% reduced rate for a period of time after patent expiration. If the Company sublicenses its patent rights, it will owe a percentage of sublicensing revenue, excluding payments based on the level of sales, profits or other levels of commercialization. During the years ended December 31, 2014, 2013 and 2012, the Company did not reach any milestones defined under the agreement and, therefore, no amounts have been paid or expensed.

During 2012, the Company executed a license agreement with a research institution for an exclusive, sublicensable, worldwide, royalty-bearing license. The Company is obligated to pay development milestones and commercial milestone fees totaling up to $1.0 million. Under the agreement, if the Company uses the inventors in the clinical research, the development milestones are waived and commercial milestones shall change to $0.8 million plus any waived milestones. The Company will also pay $25,000 annually upon first commercial sale as well as royalties of 1.5% of net sales on any products developed under the patents. During the years ended December 31, 2014, 2013 and 2012, the Company did not reach any milestones defined under the agreement and, therefore, no amounts have been

paid or expensed.

In May 2014, the Company executed a collaboration agreement with a research technology company. The Company paid an upfront and research fee of $0.3 million upon execution of the agreement and the Company is obligated to pay additional research fees of approximately $0.6 million over approximately the next year, depending on the success of the research program. The Company also received an option to obtain a commercial license to the molecules developed during the collaboration. During the year ended December 31, 2014, the Company expensed milestones and fees of $0.6 million, which is recorded as research and development expense.

10. Stock-Based Compensation

At December 31, 2014, the Company had two stock-based compensations plans, which are more fully described below.

The Company's 2003 Stock Option and Restricted Stock Plan (the 2003 Plan) provides for the issuance of stock options, restricted stock awards, and restricted stock to employees, officers, directors, consultants and key personnel of the Company as determined by the Board. In conjunction with the effectiveness of the 2013 Equity Incentive Plan (the 2013 Plan) described below, the Company determined that no further stock options or other equity-based awards may be granted under the 2003 Plan.

On September 4, 2013, the Board and stockholders approved the adoption of the 2013 Equity Incentive Plan (the 2013 Plan). The Company has reserved for issuance an aggregate of 1,500,000 shares of common stock under the 2013 Plan which is comprised of (i) the remaining 155,884 shares reserved for issuance under the 2003 Plan and (ii) an additional 1,344,116 shares. The 2013 Plan provides that the number of shares reserved and available for issuance under the plan will automatically increase each January 1, beginning in 2014, by the lesser of (i) 3,150,000 shares, or (ii) 4% of the outstanding number of shares of the Company's common stock on the immediately preceding December 31st. This number is subject to adjustment in the event of a stock split, stock dividend or other change in the Company's capitalization. The number of options available for future grant was 1,942,608 at December 31, 2014. The Company has not granted unrestricted stock awards under the 2003 Plan or the 2013 Plan since its inception. Stock options carry an exercise price equal to the estimated fair value of the Company's common stock on the date of grant. Options generally expire 10 years following the date of grant. Stock options and restricted stock awards typically vest over 4 years, but vesting provisions can vary based on the discretion of the Board.

Shares of the Company's common stock underlying any awards that are forfeited, canceled, withheld upon exercise of an option, or settlement of an award to cover the exercise price or tax withholding, reacquired by the Company prior to vesting, satisfied without the issuance of shares of the Company's common stock, or otherwise terminated other than by exercise will be added back to the shares of common stock available for issuance under the 2013 Plan. Shares available for issuance under the 2013 Plan may be authorized but unissued shares of the Company's common stock or shares of the Company's common stock that have been reacquired by the Company.

Additionally, on September 4, 2013, the Board and stockholders approved the adoption of the 2013 Employee Stock Purchase Plan (the 2013 ESPP). Under the 2013 ESPP, 275,000 shares of the Company's common stock will be available for issuance to eligible employees. The per-share purchase price at the end of each offering period is equal to 85% of the closing price of one share of the Company’s common stock at the beginning or end of the offering period, whichever is lower, subject to Internal Revenue Service limits. The 2013 ESPP will terminate on September 4, 2023, the tenth anniversary of the initial adoption of the plan. The Board determined the initial offering period commenced on September 16, 2014 and the initial purchase will occur on the 6 month anniversary. The Company recorded $0.1 million of stock-based compensation expense for the year ended December 31, 2014 related to the 2013 ESPP. No stock-based compensation expense related to the 2013 ESPP was recorded during the years ended December 31, 2013 and 2012.

During 2014, the Company had an employee change status to a non-employee. The employee continues to vest in the options under our stock plan. The awards were reviewed under ASC 718 and ASC 505 and the fair value of the unvested options that were modified will be re-measured and the expense adjusted at each reporting period. During the years ended December 31, 2014, 2013 and 2012 non-employee stock compensation expense of $0.2 million, $3,000 and $36,000, respectively, was recorded.

The Company recognized stock-based compensation expense under the various Plans totaling $4.8 million, $2.2 million and $1.2 million during the years ended December 31, 2014, 2013 and 2012, respectively.

Total compensation cost recognized for all stock-based compensation awards in the consolidated statements of operations and comprehensive loss is as follows (in thousands):

	Year Ended December 31,		
	2014	2013	2012
Research and development	$2,065	$659	$514
General and administrative	2,713	1,537	692
	$4,778	$2,196	$1,206

The fair value of each option issued to employees was estimated on the date of grant using the Black-Scholes option pricing model with the following weighted-average assumptions:

	Year Ended December 31,		
	2014	2013	2012
Expected volatility	70.9 %	71.5 %	69.0 %
Expected term (in years)	6.0	6.0	6.0
Risk-free interest rate	1.82 %	1.85 %	0.90 %
Expected dividend yield	— %	— %	— %

Given the absence of an active market for the Company's common stock prior to the completion of the Company's initial public offering (IPO) on September 19, 2013, the Board, the members of which the Company believes have extensive business, finance, and venture capital experience, were required to estimate the fair value of the Company's common stock at the time of each option grant. The Board considered numerous objective and subjective factors in determining the value of the Company's common stock at each option grant date, including the following factors: (1) prices for the Company's preferred stock, which the Company had sold to outside investors in arm's-length transactions, and the rights, preferences, and privileges of the Company's preferred stock and common stock; (2) valuations performed by an independent valuation specialist; (3) the Company's stage of development and revenue growth; (4) the fact that the option grants involved illiquid securities in a private company; and (5) the likelihood of achieving a liquidity event for the shares of common stock underlying the options, such as an initial public offering or sale of the Company, given prevailing market conditions. The Company believes this to have been a reasonable methodology based upon the Company's internal peer company analyses, and based on several arm's-length transactions involving the Company's preferred stock, supportive of the results produced by this valuation methodology. Prior to the Company's common stock being actively traded, the determination of fair value involved assumptions, judgments and estimates. If different assumptions were made, stock-based compensation expense, net loss and consolidated net loss per share could have been significantly different.

The fair value of each option grant issued under the Company's stock-based compensation plans was estimated using the Black-Scholes option-pricing model. As there was no public market for its common stock prior to September 19, 2013, the effective date of the Company's IPO, and as the trading history of the Company's common stock was limited through December 31, 2014, the Company determined the volatility for options granted based on an analysis of reported data for a peer group of companies that issued options with substantially similar terms. The expected volatility of options granted has been determined using an average of the historical volatility measures of this peer group of companies. The expected life of options has been determined utilizing the "simplified method". The simplified method is based on the average of the vesting tranches and the contractual life of each grant. The risk-free interest rate is based on a treasury instrument whose term is consistent with the expected life of the stock options. The Company has not paid, and does not anticipate paying, cash dividends on its common stock; therefore, the expected dividend yield is assumed to be zero. In addition, based on an analysis of the historical actual forfeitures, the Company applied an estimated forfeiture rate of approximately 4%, 4% and 5% for the years ended December 31, 2014, 2013 and 2012, respectively, in determining the expense recorded in the accompanying consolidated statements of operations and comprehensive loss.

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Stock Option Activity
The following table summarizes the stock option activity under the Company's stock option plans during the year ended December 31, 2014 (in thousands, except per share amounts and years):

	Number of Grants	Weighted-Average Exercise Price Per Share	Weighted-Average Contractual Life (in years)	Aggregate Intrinsic Value(1)
Outstanding at December 31, 2013	3,942	$7.05		
Granted	204	$38.35		
Exercised	(854)	$3.76		
Canceled or forfeited	(82)	$19.99		
Outstanding at December 31, 2014	3,210	$9.57	5.96	$95,007
Exercisable at December 31, 2014	2,292	$5.90	4.95	$75,880,284
Vested and expected to vest at December 31, 2014(2)	3,164	$9.40	5.92	$94,160,194

(1) The aggregate intrinsic value is calculated as the difference between the exercise price of the underlying options and the estimated fair value of the common stock for the options that were in the money at December 31, 2014 and 2013.

(2) This represents the number of vested options at December 31, 2014, plus the number of unvested options expected to vest at December 31, 2014, based on the unvested options outstanding at December 31, 2014, adjusted for the estimated forfeiture rate.

During the years ended December 31, 2014, 2013 and 2012, the Company granted stock options to purchase an aggregate of 203,550 shares, 552,750 shares and 722,000 shares of its common stock, respectively, with weighted-average grant date fair values of options granted of $24.39, $15.27 and $7.20, respectively.
During the years ended December 31, 2014, 2013 and 2012, current and former employees of the Company exercised a total of 853,507 options, 292,802 options and 38,697 options, respectively, resulting in total proceeds of $3.2 million, $0.7 million and $0.2 million, respectively.
The aggregate intrinsic value of options exercised during the years ended December 31, 2014, 2013 and 2012, under the Company's stock option plans, was $26.3 million, $7.0 million and $47,000, respectively.
As of December 31, 2014, there was $10.0 million of unrecognized compensation expense that is expected to be recognized over a weighted-average period of 2.32 years.

11. 401(k) Savings Plan
In 2004, the Company established a defined-contribution savings plan under Section 401(k) of the Internal Revenue Code (the 401(k) Plan). The 401(k) Plan covers all employees who meet defined minimum age and service requirements, and allows participants to defer a portion of their annual compensation on a pretax basis. For 2014, the Board approved matching contributions of up to $2,500 per eligible participant pursuant to the 401(k) Savings Plan’s matching formula. All matching contributions and participant contributions vest immediately. Contributions totaled $0.2 million for the year ended December 31, 2014 and have been recorded in the consolidated statement of operations and comprehensive loss.
12. Income Taxes
The Company provides for income taxes under ASC 740. Under ASC 740, the liability method is used in accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on differences between

financial reporting and 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.

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For the years ended December 31, 2014, 2013 and 2012, the Company did not record a current or deferred income tax expense or benefit.

The Company's loss before income taxes was $(51.3) million, $(21.9) million and $(32.6) million for the years ended December 31, 2014, 2013 and 2012, respectively, and was generated entirely in the United States.

Deferred taxes are recognized for temporary differences between the basis of assets and liabilities for financial statement and income tax purposes. The significant components of the Company's deferred tax assets are comprised of the following (in thousands):

	Year Ended December 31,	
	2014	2013
Deferred tax assets:		
U.S. and state net operating loss carryforwards	$75,334	$51,886
Research and development credits	6,704	5,519
Deferred revenue	2,348	3,005
Accruals and other temporary differences	5,416	5,675
Total deferred tax assets	89,802	66,085
Less valuation allowance	(89,802)	(66,085)
Net deferred tax assets	$—	$—

The Company has evaluated the positive and negative evidence bearing upon the realizability of its deferred tax assets. Based on the Company's history of operating losses, the Company has concluded that it is more likely than not that the benefit of its deferred tax assets will not be realized. Accordingly, the Company has provided a full valuation allowance for deferred tax assets as of December 31, 2014 and 2013. The valuation allowance increased by $23.7 million during the year ended December 31, 2014, due primarily to the generation of net operating losses during the period.

A reconciliation of income tax expense computed at the statutory federal income tax rate to income taxes as reflected in the consolidated financial statements is as follows:

	Year Ended December 31,		
	2014	2013	2012
Federal income tax expense at statutory rate	34.0%	34.0%	34.0%
State income tax, net of federal benefit	4.1%	(1.5)%	4.2%
Permanent differences	2.0%	(43.1)%	(3.4)%
Research and development credit	1.6%	0.7%	—%
Other	4.6%	—%	(0.4)%
Change in valuation allowance	(46.3)%	9.9%	(34.4)%
Effective income tax rate	—%	—%	—%

As of December 31, 2014 and 2013, the Company had U.S. federal net operating loss carryforwards of $211.2 million and $141.0 million, respectively, which may be available to offset future income tax liabilities and expire at various dates through 2034. As of December 31, 2014 and 2013, the Company also had U.S. state net operating loss carryforwards of $165.0 million and $122.9 million, respectively, which may be available to offset future income tax liabilities and expire at various dates through 2034. Included in the federal and state net operating loss carryforwards are approximately $13.2 million and $5.7 million, respectively, of deductions related to the exercise of stock options which represent an excess tax benefit which will be realized when it results in the reduction of cash income tax in accordance with ASC 718.

As of December 31, 2014 and 2013, the Company had federal research and development tax credit carryforwards of $4.8 million and $3.9 million, respectively, available to reduce future tax liabilities which expire at various dates

through 2034. As of December 31, 2014 and 2013, the Company had state research and development tax credit carryforwards of approximately $2.9 million and $2.4 million, respectively, available to reduce future tax liabilities which expire at various dates through 2029.

Under the provisions of the Internal Revenue Code, the net operating loss and tax credit carryforwards are subject to review and possible adjustment by the Internal Revenue Service and state tax authorities. Net operating loss and tax credit carryforwards may become subject to an annual limitation in the event of certain cumulative changes in the ownership interest of significant shareholders over a three year period in excess of 50 percent, as defined under Sections 382 and 383 of the Internal Revenue Code, respectively, as well as similar state provisions. This could limit the amount of tax attributes that can be utilized annually to offset future taxable income or tax liabilities. The amount of the annual limitation is determined based on the value of the Company immediately prior to the ownership change. Subsequent ownership changes may further affect the limitation in future years. The Company has completed several financings since its inception which may have resulted in a change in control as defined by Sections 382 and 383 of the Internal Revenue Code, or could result in a change in control in the future. Through June 2014, the Company completed an assessment to determine whether there may have been a Section 382 ownership change and determined that it is more-likely-than-not that the Company's net operating and tax credit amounts as disclosed are not subject to any material Section 382 limitations.

The Company will recognize interest and penalties related to uncertain tax positions in income tax expense. As of December 31, 2014 and 2013, the Company had no accrued interest or penalties related to uncertain tax positions and no amounts have been recognized in the Company's consolidated statements of operations and comprehensive loss.

For all years through December 31, 2014, the Company generated research credits but has not conducted a study to document the qualified activities. This study may result in an adjustment to the Company's research and development credit carryforwards; however, until a study is completed and any adjustment is known, no amounts are being presented as an uncertain tax position for the years ended December 31, 2014 and 2013. A full valuation allowance has been provided against the Company's research and development credits and, if an adjustment is required, this adjustment would be offset by an adjustment to the deferred tax asset established for the research and development credit carryforwards and the valuation allowance.

The Company files income tax returns in the United States, and various state jurisdictions. The federal and state income tax returns are generally subject to tax examinations for the tax years ended December 31, 2011 through December 31, 2014. To the extent the Company has tax attribute carryforwards, the tax years in which the attribute was generated may still be adjusted upon examination by the Internal Revenue Service, state or foreign tax authorities to the extent utilized in a future period.

13. Long-Term Debt

On June 7, 2012, the Company entered into a loan and security agreement (the Loan Agreement) with three lenders, pursuant to which the Company received a loan in the aggregate principal amount of $20.0 million. The Company was required to repay the aggregate principal balance under the Loan Agreement in 42 months. The first 12 payments were interest only and the remaining 30 payments were equal monthly installments of principal plus interest. The Loan Agreement provided that the interest only period could be extended under certain circumstances. The Company did not trigger the requirements and began paying principal in July 2013.

Per annum interest was payable at the 8.5%. The Loan Agreement also included a closing fee of $0.2 million. The Company amortized the cost over the 42 months of loan. The Loan Agreement was also subject to an additional deferred payment of $1.2 million due with the final payment. The Company recorded the deferred payment to interest expense over the term of the Loan Agreement. The resulting effective interest rate was approximately 11.8%. The Loan Agreement was secured by a lien on all of the Company's personal property as of, or acquired after, the date of the Loan Agreement, except for intellectual property.

On March 12, 2014, the Company repaid the outstanding balance of the Loan Agreement. At the time of repayment the Company recognized interest expense related to the remaining $0.6 million of the $1.2 million deferred payment due with the final payment. The Company also recognized $0.3 million in prepayment fees as additional expense

14. Related Party Transactions

Celgene Corporation (Celgene)
In connection with its entry into the collaboration agreement with Celgene, on February 2008, the Company sold Celgene 457,875 shares of its Series C-1 Preferred Stock. As part of the Company's June 2010 Series E financing, Celgene purchased 36,496 shares of Series E Preferred Stock and received warrants to purchase 38,979 shares of common stock. As part of the

Company's December 2011 Series F financing, Celgene purchased 1,990,446 shares of Series F Preferred Stock. In connection with the Company's IPO, Celgene purchased 666,667 shares of common stock. In connection with the Company's January 2014 public offering, Celgene purchased 300,000 shares of common stock. In May 2014, Celgene purchased 1,100,000 shares of common stock from five current shareholders of the Company. As a result of these transactions, Celgene owned 12.8% and 9.7% of the Company's fully diluted equity as of December 31, 2014 and 2013, respectively. Refer to Note 9 for additional information regarding this collaboration agreement.

During the years ended December 31, 2014, 2013 and 2012, the Company recognized $14.6 million, $32.3 million and $4.9 million, respectively, in collaboration revenue under the Celgene collaboration arrangement. As of December 31, 2014 and 2013, the Company had $6.0 million and $7.7 million, respectively, of deferred revenue related to the Celgene collaboration arrangement.

The Company recognized revenue from Celgene during the years ended December 31, 2014, 2013 and 2012 as follows (in thousands):

	Year Ended December 31,		
	2014	2013	2012
License and milestone	$1,673	$19,626	$2,035
Cost sharing, net	12,959	12,658	2,879
	$14,632	$32,284	$4,914

Related-Party Receivable

On January 28, 2008, the Company issued a secured promissory note (the Note Receivable) in the amount of $0.2 million to the current chief executive officer of the Company (the CEO). The Note Receivable bore interest at an annual interest rate of 3.11% and was initially repayable on the earlier of January 28, 2011, or the date prior to the date that the Company files a registration statement with the SEC, covering shares of its common stock. The Note Receivable was secured by shares of the Company's common stock owned by the CEO. On December 22, 2010, the term was extended until January 28, 2014, or the date prior to the date that the Company files a registration statement with the SEC covering shares of its common stock.

In November 2012, the Company further modified the terms of the Note Receivable, such that in the event that an acquisition event occurs or the Company files a registration statement with the SEC on or before the maturity date, the unpaid principal and interest will be forgiven. As a result of the Company's filing of a registration statement with the SEC on August 6, 2013 which triggered the forgiveness of the Note Receivable, the Company expensed the unpaid principal and interest expense totaling $0.2 million as compensation expense during the year ended December 31, 2013.

15. Subsequent Events

The Company considers events or transactions that occur after the balance sheet date but prior to the issuance of the financial statements to provide additional evidence relative to certain estimates or to identify matters that require additional disclosure. The Company has evaluated all subsequent events and determined that there are no material recognized or unrecognized subsequent events requiring disclosure.

16. Quarterly Financial Data (unaudited)

The following table presents certain unaudited quarterly financial information for the eight quarters in the period ended December 31, 2014. This information has been prepared on the same basis as the audited financial statements and includes all adjustments (consisting only of normal recurring adjustments) necessary to present fairly the unaudited quarterly results of operations set forth herein. Net income (loss) per share for all periods presented have been retroactively adjusted to reflect the 1-for-4 reverse stock split effected on September 5, 2013.

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Acceleron Pharma Inc.
Notes to Consolidated Financial Statements (Continued)
Years Ended December 31, 2014, 2013 and 2012

	For the Three Months Ended(1)			
	March 31	June 30	September 30	December 31
	(in thousands except per share data)			
2014:				
Total revenue	$3,307	$4,078	$3,508	$3,739
Total costs and expenses	15,515	21,389	14,899	18,293
Loss from operations	(12,208)	(17,311)	(11,391)	(14,554)
Net loss	(9,120)	(16,550)	(7,972)	(17,617)
Basic net loss per share*	$(0.30)	$(0.52)	$(0.25)	$(0.55)
Diluted net loss per share*	$(0.30)	$(0.52)	$(0.25)	$(0.55)
2013:				
Total revenue	$15,012	$26,427	$4,270	$11,521
Total costs and expenses	(11,876)	(12,276)	(11,154)	(14,972)
Income (loss) from operations	3,136	14,151	(6,884)	(3,451)
Net income (loss)	1,647	13,078	(18,513)	(18,110)
Basic net income (loss) per share*	$(0.24)	$0.30	$(5.62)	$(0.64)
Diluted net income (loss) per share*	$(0.24)	$0.28	$(5.62)	$(0.64)

(1) The amounts were computed independently for each quarter, and the sum of the quarters may not total the annual amounts.

* Applicable to common stockholders

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Exhibits

Exhibit Number	Exhibit Description	Filed with this Report	Incorporated by Reference herein from Form or Schedule	Filing Date	SEC File/Reg. Number
3.1	Restated Certificate of Incorporation		Form 8-K (Exhibit 3.1)	9/24/2013	001-36065
3.2	Amended and Restated By-laws		Form 8-K (Exhibit 3.2)	9/24/2013	001-36065
4.1	Form of Common Stock Certificate		Form S-1 (Exhibit 4.1)	8/7/2013	333-190417
4.2	Form of Amended and Restated Registration Rights Agreement		Form S-1 (Exhibit 4.2)	8/7/2013	333-190417
4.3	Form of Warrant to Purchase Stock, issued to Series E Investors as of June 10, 2010 and July 9, 2010		Form S-1 (Exhibit 4.3)	8/7/2013	333-190417
4.4	Form of Common Stock Warrant Certificate, issued to General Electric Capital Corporation as of March 28, 2007		Form S-1 (Exhibit 4.4)	8/7/2013	333-190417
10.1*	Form of Director Indemnification Agreement		Form S-1 (Exhibit 10.1)	8/7/2013	333-190417
10.2+	Collaboration, License and Option Agreement between Acceleron Pharma Inc. and Celgene Corporation, dated as of February 20, 2008, and amended as of August 2, 2011		Form S-1/A (Exhibit 10.6)	9/6/2013	333-190417
10.3	Amended and Restated License Agreement between Acceleron Pharma Inc. and Ludwig Institute for Cancer Research Ltd., dated as of August 6, 2010		Form S-1 (Exhibit 10.7)	8/7/2013	333-190417
10.4+	Exclusive License Agreement between Beth Israel Deaconess Medical Center and Acceleron Pharma Inc., dated as of June 21, 2012		Form S-1 (Exhibit 10.8)	8/7/2013	333-190417
10.5+	Collaboration, License and Option Agreement between Acceleron Pharma Inc. and Celgene Corporation, dated as of August 2, 2011		Form S-1/A (Exhibit 10.9)	9/6/2013	333-190417
10.6	Exclusive License Agreement between Salk Institute for Biological Studies and Acceleron Pharma Inc., dated as of August 10, 2010		Form S-1 (Exhibit 10.10)	8/7/2013	333-190417
10.7	Amended and Restated License Agreement between Salk Institute for Biological Studies and Acceleron Pharma Inc., dated as of August 11, 2010		Form S-1 (Exhibit 10.11)	8/7/2013	333-190417
10.8	Amendment, dated as of July 25, 2014, to Amended and Restated License Agreement between Salk Institute for Biological Studies and Acceleron Pharma Inc. dated as of August 11, 2010		Form 10-Q (Exhibit 10.1)	8/12/2014	001-36065
10.9	Indenture of Lease between Massachusetts Institute of Technology and Acceleron Pharma Inc., dated as of May 20, 2008		Form S-1 (Exhibit 10.12)	8/7/2013	333-190417
10.10*	Acceleron Pharma Inc. 2013 Equity Incentive Plan		Form S-8 (Exhibit 4.4)	12/12/2013	333-192789

10.11*	Form of Acceleron Pharma Inc. Cash Incentive Plan		Form S-1/A (Exhibit 10.14)	8/19/2013	333-190417
10.12*	Acceleron Pharma Inc. 2003 Stock Option and Restricted Stock Plan		Form S-1 (Exhibit 10.15)	8/7/2013	333-190417
10.13*	Amended and Restated Employment Agreement between John Knopf and Acceleron Pharma Inc., dated as of August 26, 2013	X			
10.14*	Amended and Restated Employment Agreement between Matthew L. Sherman and Acceleron Pharma Inc., dated as of August 26, 2013	X			

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Exhibit Number	Exhibit Description	Filed with this Report	Incorporated by Reference herein from Form or Schedule	Filing Date	SEC File/Reg. Number
10.15*	Amended and Restated Employment Agreement between John D. Quisel and Acceleron Pharma Inc., dated as of August 26, 2013	X			
10.16*	Amended and Restated Employment Agreement between Kevin F. McLaughlin and Acceleron Pharma Inc. dated as of January 31, 2014	X			
10.17*	Amended and Restated Employment Agreement between Steven D. Ertel and Acceleron Pharma Inc. dated as of January 31, 2014	X			
10.18*	Employee Stock Purchase Plan		Form S-1/A (Exhibit 10.20)	9/6/2013	333-190417
10.19*	Form of Non-Statutory Stock Option Agreement under the 2013 Equity Incentive Plan		Form S-1 (Exhibit 10.21)	1/9/2014	333-193252
10.20*	Form of Incentive Stock Option Agreement under the 2013 Equity Incentive Plan		Form S-1 (Exhibit 10.22)	1/9/2014	333-193252
10.21*	Form of Restricted Stock Unit Award Agreement under the 2013 Equity Incentive Plan	X			
21.1	List of Subsidiaries		Form 10-K (Exhibit 21.1)	3/17/2014	001-36065
23.1	Consent of Ernst & Young LLP, Independent Registered Public Accounting Firm	X			
31.1	Certification of Principal Executive Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002	X			
31.2	Certification of Principal Financial Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002	X			
32.1	Certification of Principal Executive Officer and Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002	X			
101	The following financial information from the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014 formatted in XBRL (eXtensible Business Reporting Language): (i) Consolidated Balance Sheets as of December 31, 2014 and December 31, 2013, (ii) Consolidated Statements of Operations and Comprehensive Loss for the years ended December 31, 2014, 2013 and 2012, (iii) Consolidated Statements of Comprehensive Income for the years ended December 31, 2014, 2013 and 2012, (iv) Consolidated Statements of	X			

Redeemable Convertible Preferred Stock and Stockholders' Equity (Deficit) for the years ended December 31, 2014, 2013 and 2012, (v) Consolidated Statements of Cash Flows for the years ended December 31, 2014, 2013 and 2012, and (vi) Notes to Consolidated Financial Statements

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+ Confidential treatment has been granted by, or is being requested from, the Securities and Exchange Commission as to certain portions of this Exhibit, which portions have been omitted and filed separately with the Securities and Exchange Commission as part of an application for confidential treatment pursuant to the Securities Act of 1933, as amended, and the Securities Exchange Act of 1934, as amended, as applicable.

* Management contract or compensatory plan or arrangement.

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Signatures

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

Date: March 2, 2015

ACCELERON PHARMA INC.

By: /s/ JOHN L. KNOPF, PH.D.
John L. Knopf, Ph.D.
Chief Executive Officer, President and Director

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

Signature	Title	Date
/s/ JOHN KNOPF, PH.D. John L. Knopf, Ph.D.	Chief Executive Officer, President and Director (Principal Executive Officer)	March 2, 2015
/s/ KEVIN F. MCLAUGHLIN Kevin F. McLaughlin	Senior Vice President, Chief Financial Officer and Treasurer (Principal Financial Officer and Principal Accounting Officer)	March 2, 2015
/s/ JEAN M. GEORGE Jean M. George	Director	March 2, 2015
/s/ GEORGE GOLUMBESKI, PH.D. George Golumbeski, Ph.D.	Director	March 2, 2015
/s/ EDWIN M. KANIA, JR. Edwin M. Kania, Jr.	Director	March 2, 2015
/s/ TERRENCE C. KEARNEY Terrence C. Kearney	Director	March 2, 2015
/s/ TOM MANIATIS, PH.D. Tom Maniatis, Ph.D.	Director	March 2, 2015
/s/ TERRANCE G. MCGUIRE Terrance G. McGuire	Director	March 2, 2015
/s/ FRANCOIS NADER, M.D. Francois Nader, M.D.	Director	March 2, 2015
/s/ RICHARD F. POPS Richard F. Pops	Director	March 2, 2015
/s/ JOSEPH S. ZAKRZEWSKI Joseph S. Zakrzewski	Director	March 2, 2015