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Registration No. 333-189216

Prospectus

5,888,888 Shares

Common stock

Agios Pharmaceuticals, Inc. is offering 5,888,888 shares of its common stock. This is our initial public offering, and no public market currently exists for our shares. Our common stock has been approved for listing on The NASDAQ Global Select Market under the symbol "AGIO." The initial public offering price is $18.00 per share.

We are an emerging growth company as that term is used in the Jumpstart Our Business Startups Act of 2012, and as such, have elected to comply with certain reduced public reporting requirements.

Investing in our common stock involves risks. See "Risk factors" beginning on page 9 of this prospectus.

	Per share	Total
Public offering price	$ 18.00	$105,999,984
Underwriting discounts(1)	$ 1.26	$ 7,419,999
Proceeds, before expenses, to Agios Pharmaceuticals, Inc.	$16.74	$ 98,579,985

(1) We have agreed to reimburse the underwriters for certain FINRA-related expenses. See "Underwriting" beginning on page 141 of this prospectus.

We have granted the underwriters the right to purchase up to an additional 883,333 shares of common stock, to cover over-allotments. The underwriters can exercise this right at any time within 30 days after the date of this prospectus.

An affiliate of Celgene, our cancer metabolism strategic alliance partner, has agreed to purchase $12.75 million of our common stock in a separate private placement concurrent with the completion of this offering at a price per share equal to the public offering price. The sale of such shares will not be registered under the Securities Act of 1933, as amended. The closing of this offering is not conditioned upon the closing of such concurrent private placement.

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

The underwriters expect to deliver the shares of common stock to investors on or about July 29, 2013.

J.P. Morgan **Goldman, Sachs & Co.**

Cowen and Company **Leerink Swann**

The date of this prospectus is July 23, 2013.

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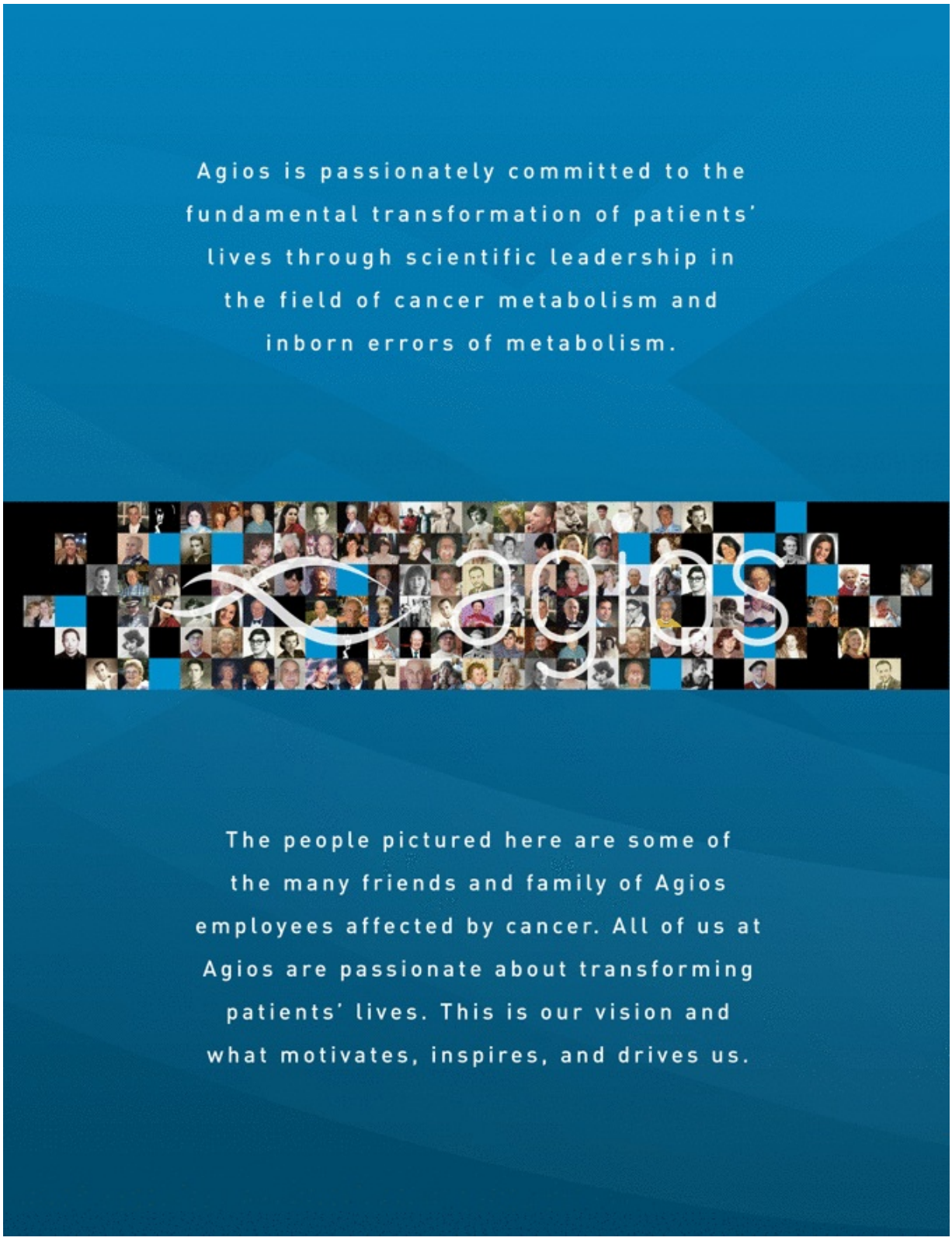

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We have not authorized anyone to provide you with any information other than that contained in this prospectus or in any free writing prospectus we may authorize to be delivered or made available to you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. We are offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where offers and sales are permitted. The information in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or any sale of shares of our common stock.

Until August 17, 2013 (25 days after the commencement of this offering), all dealers that buy, sell or trade shares of our common stock, whether or not participating in this offering, may be required to deliver a prospectus. This delivery requirement is in addition to the obligation of dealers to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

For investors outside the United States: We have not and the underwriters have not done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of common stock and the distribution of this prospectus outside the United States.

Prospectus summary

This summary highlights information contained elsewhere in this prospectus. This summary does not contain all of the information you should consider before investing in our common stock. You should read this entire prospectus carefully, especially the "Risk factors" section beginning on page 9 and our consolidated financial statements and the related notes appearing at the end of this prospectus, before making an investment decision.

Overview

We are a biopharmaceutical company passionately committed to applying our scientific leadership in the field of cellular metabolism to transform the lives of patients with cancer and inborn errors of metabolism, or IEMs, which are a subset of orphan genetic metabolic diseases. Metabolism is a complex biological process involving the uptake and assimilation of nutrients in cells to produce energy and facilitate many of the processes required for cellular division and growth. We believe that dysregulation of normal cellular metabolism plays a crucial role in many diseases, including certain cancers and IEMs. We singularly focus our efforts on using cellular metabolism, an unexploited area of biological research with disruptive potential, as a platform for developing potentially transformative small molecule medicines for cancer and IEMs. We intend to apply our deep understanding of metabolism, coupled with our ability to create medicines that can inhibit or activate metabolic enzymes, to fundamentally change the way cancer and IEMs are treated. We have identified and validated novel and druggable targets in both cancer and IEMs. We filed an investigational new drug application, or IND, for our first product candidate, AG-221, with the U.S. Food and Drug Administration, or FDA, on June 20, 2013. To date, we have not filed any other INDs, and we have not commenced clinical trials for any of our product candidates.

Our two most advanced cancer programs are targeting mutations in the enzymes isocitrate dehydrogenase 1 and 2, referred to as IDH1 and IDH2. Both program targets are genetically validated, which means the importance of such targets have been demonstrated based on genetics, and represent two of the most promising metabolic targets in cancer biology, as concluded by the leading scientific journal *Nature* in 2011. Extensive publications led by Agios scientists validate our belief that these mutations are initiating and driving events in many cancers. These two otherwise normal metabolic enzymes are mutated in a wide range of cancers, including both solid tumors and hematological malignancies. Our drug candidates are selective for the mutated forms of IDH1 and IDH2 found in cancer cells versus the normal forms of IDH1 and IDH2 found in all other cells. We expect to commence clinical trials in patients with IDH2-mutation positive cancers with AG-221, the lead candidate in our IDH2 program, by mid-2013. In the IDH1 program, we expect to commence clinical trials in patients with IDH1-mutation positive cancers with our lead development candidate, AG-120, by early 2014.

We are also focused on developing medicines to address IEMs, with a novel approach to these orphan diseases for which no effective or disease-modifying therapy is currently available. A hallmark of IEMs is abnormal cellular metabolic activity due to a genetic defect, which results in the accumulation or deficit of certain metabolites, which are intermediates or small molecule products of metabolism, disrupting normal metabolic functions. We apply our core capabilities in exploring cellular metabolism to identify key cellular targets in affected cells and design novel small molecules with the potential to correct the metabolic defect in patients afflicted with these diseases. We have successfully used this approach in our most advanced IEM program —pyruvate kinase deficiency, or PK deficiency, a rare form of hereditary hemolytic anemia. The disease is characterized by mild to severe forms of anemia. There are no currently available treatments other than supportive care, which includes splenectomy, transfusion support and chelation, which refers to the removal of excess iron from the human body with a therapeutic agent. Our lead development candidate, AG-348, is a potent, orally available small molecule activator of the PKR enzyme, an isoform of PK that, when mutated, leads to PK deficiency. Our current plan is to enter clinical trials in patients with PK deficiency in 2014.

Our ability to identify, validate and drug novel targets is enabled by a set of core capabilities. Key proprietary aspects of our core capabilities in cellular metabolism include the ability to monitor numerous metabolic pathways in cells or tissues in a high throughput fashion and expertise in "flux biochemistry." This refers to the dynamic analysis of how metabolites accumulate or diminish as they are created or chemically altered by multiple networks of metabolic enzymes. Complex mathematical modeling of metabolic pathways, enzymatic activity and the flux of metabolites through metabolic enzymatic reactions within diseased tissues allow us to identify novel biomarkers, which are biological parameters that can be measured to characterize a disease state or the effect of therapy, and targets for drug discovery.

Our understanding of metabolism within diseased tissues has enabled the development of pharmacodynamic markers, which are methods to measure the effect of a drug on the target of interest and the patient, and patient selection strategies for clinical development. Utilizing our approach, we identify altered metabolic pathways within abnormal cells. Altered metabolic pathways generate disease-specific metabolic fingerprints, comprising patterns of metabolite levels, which are the amounts of particular metabolites, that can be exploited in both discovery and development of novel therapeutics. Metabolites make ideal biomarkers because they are readily measured in the target tissues and blood. Metabolic biomarkers can identify appropriate patients for clinical trials, serve as pharmacodynamic markers to characterize medicine/target engagement in patients, and permit the monitoring of patient response to therapy. The clinical development strategy for all of our product candidates will always include initial study designs that allow for genetically or biomarker defined patient populations, enabling the potential for proof of concept early in clinical development, along with the potential for accelerated approval.

We engage in a rigorous process that only allows the most promising programs to enter the last stage of drug discovery. We have been successful at fully validating four novel cancer targets to date with an additional ten novel targets currently in various stages of the validation process. We have also "de-validated" and terminated numerous programs, including many that have been reported in scientific journals. In our IEM portfolio, we use an equally rigorous set of validation techniques. We will only progress drug candidates forward into phase 1 trials if we have the ability to select patients who are most likely to respond to a given therapy based on genetic or metabolic biomarkers. While many factors are considered critical to maximize the probability of technical success in the drug development process, perhaps none is more important than identifying highly specific and selective molecules aimed at the best possible targets for therapy coupled with the patients most likely to respond to that therapy. Our goal is to develop increasing confidence in the target and the patient population prior to entering human clinical trials and then initiate those first human trials in a patient population that has been selected based on target dependence using a biomarker. This approach, known as personalized or precision medicine, is used in the industry to lead to the potential for clear proof of concept in early human trials.

In April 2010, we entered into a collaboration agreement with Celgene focused on cancer metabolism. Under the collaboration, we are leading discovery, preclinical and early clinical development for all cancer metabolism programs. The discovery phase of the collaboration expires in April 2014, subject to Celgene's option to extend the discovery phase for up to two additional years. Celgene has the option to obtain exclusive rights for the further development and commercialization of certain of these programs, and we will retain rights to the others. For the programs that Celgene chooses to license, we may elect to participate in a portion of the sales activities for the medicines from such programs in the United States. In addition, for certain of these programs, we may elect to retain full rights to develop and commercialize medicines from these programs in the United States. Through March 31, 2013, we have received approximately $141.2 million in payments from Celgene and $37.5 million in equity investments. We are also eligible to receive extension payments, payments upon the successful achievement of specified milestones, reimbursements for certain development expenses and royalties on any product sales. We have retained the option for exclusive rights to develop and commercialize AG-120 in the United States.

We have assembled a set of core capabilities at the intersection of cellular biology and metabolism, centered on the expertise of our founding scientists who are widely considered to be the thought leaders in cancer metabolism—Lew Cantley, Ph.D. (director of the Cancer Center at Weill Cornell Medical College and New York Presbyterian Hospital), Tak Mak, Ph.D. (professor of medical biophysics, University of Toronto) and Craig Thompson, M.D. (president and CEO of Memorial Sloan-Kettering Cancer Center)—as well as on the strength of our management team, including our CEO, David Schenkein, M.D., and a group of world class scientists. We have built an exceptional team of cancer biologists, enzymologists and a core group of metabolomic experts that interrogate cellular metabolism to identify key metabolic targets and biomarkers in cancer and IEMs. Our scientists have published 11 scientific papers since 2009, including four in *Nature* and three in *Science*. We have also established an intellectual property portfolio consisting of over 100 patent applications worldwide, including multiple patent applications directed to our lead product candidates, together with trade secrets, know-how and continuing technological innovation. The technology underlying the pending patent applications directed to our lead product candidates has been developed by us and was not acquired from any in-licensing agreement.

Our strategy

We aim to build a multi-product company, based on our expertise in cellular metabolism, that discovers, develops and commercializes first- and best-in-class medicines to treat cancer and IEMs. Key elements of our strategy include:

- ***Aggressively pursuing the development of novel medicines to transform the lives of patients with cancer and IEMs.***
- ***Maintaining our competitive advantage and singular focus in the field of cellular metabolism.***
- ***Continuing to build a product engine for cancer and IEMs to generate novel and important medicines.***
- ***Building a preeminent independent biopharmaceutical company by engaging in discovery, development and commercialization of our medicines.***
- ***Maintaining a commitment to precision medicine in drug development.***

Our guiding principles

We aim to build a long-term company with a disciplined focus on developing medicines that transform the lives of patients with cancer and IEMs. We maintain a culture of high integrity that embraces the following guiding principles, which we believe will provide long-term benefits for all our stakeholders:

- ***Follow the science and do what is right for patients.***
- ***Maintain a culture of incisive decision-making driven by deep scientific interrogation and "respectful irreverence."***
- ***Foster collaborative spirit that includes all employees regardless of function or level.***
- ***Leverage deep strategic relationships with our academic and commercial partners to improve the quality of our discovery and development efforts.***

Risks associated with our business

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

- We have incurred significant losses since inception. We expect to incur losses for the foreseeable future and may never achieve or maintain profitability. As of March 31, 2013, we had an accumulated deficit of $81.3 million.
- We will need substantial additional funding. If we are unable to raise capital when needed, we would be forced to delay, reduce or eliminate our product development programs or commercialization efforts.
- Our short operating history may make it difficult for you to evaluate the success of our business to date and to assess our future viability.
- Our approach to the discovery and development of product candidates that target cellular metabolism is unproven, and we do not know whether we will be able to develop any medicines of commercial value.
- If clinical trials of our product candidates fail to demonstrate safety and efficacy 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 product candidates.
- We depend on our collaboration with Celgene and may depend on collaborations with additional third parties for the development and commercialization of our product candidates. If those collaborations are not successful, we may not be able to capitalize on the market potential of these product candidates.
- We currently do not own or license any issued patents for our key medicines or technology.
- If we are unable to obtain and maintain patent or trade secret protection for our medicines and technology, or if the scope of the patent protection obtained is not sufficiently broad, our competitors could develop and commercialize medicines and technology similar or identical to ours, and our ability to successfully commercialize our medicines and technology may be adversely affected.
- If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals, we will not be able to commercialize, or will be delayed in commercializing, our product candidates, and our ability to generate revenue will be materially impaired.

Concurrent private placement

An affiliate of Celgene, our cancer metabolism strategic alliance partner, has agreed to purchase $12.75 million of our common stock in a separate private placement concurrent with the completion of this offering at a price per share equal to the public offering price. The sale of such shares will not be registered under the Securities Act of 1933, as amended. The closing of this offering is not contingent upon the closing of such concurrent private placement.

Our corporate information

We were incorporated under the laws of the State of Delaware in August 2007. Our executive offices are located at 38 Sidney Street, 2 nd Floor, Cambridge, Massachusetts 02139, and our telephone number is (617) 649-8600. Our website address is www.agios.com. The information contained in, or accessible through, our website does not constitute part of this prospectus. We have included our website address in this prospectus solely as an inactive textual reference.

As used in this prospectus, unless the context otherwise requires, references to "Agios," "we," "us," "our" and similar references refer to Agios Pharmaceuticals, Inc. and, where appropriate, our consolidated subsidiary. The trademarks, trade names and service marks appearing in this prospectus are the property of their respective owners.

The offering	
Common stock offered	5,888,888 shares
Common stock to be sold in the concurrent private placement to an affiliate of Celgene	708,333 shares
Common stock to be outstanding after this offering and the concurrent private placement to an affiliate of Celgene	30,127,620 shares
Option to purchase additional shares	The underwriters have an option for a period of 30 days to purchase up to 883,333 additional shares of our common stock.
Use of proceeds	We intend to use the net proceeds from this offering and the concurrent private placement as follows: approximately $5 million to fund the costs of phase 1 clinical development of AG-221; if we exercise our option to develop and commercialize AG-120 in the United States, approximately $20-25 million to fund IND-enabling costs and our share of early development costs for AG-120; approximately $20 million to fund the IND-enabling activities and phase 1/2 clinical development of AG-348; approximately $20-25 million to fund research and development to advance our pipeline of earlier-stage cancer metabolism and IEM programs; and the remainder for working capital and other general corporate purposes. See "Use of proceeds" for more information.
Risk factors	You should read the "Risk factors" section of this prospectus for a discussion of factors to consider carefully before deciding to invest in shares of our common stock.
NASDAQ Global Select Market symbol	"AGIO"

The number of shares of our common stock to be outstanding after this offering and the concurrent private placement is based on 3,798,835 shares of our common stock outstanding as of May 31, 2013, 708,333 shares to be issued to an affiliate of Celgene in the concurrent private placement and 19,731,564 additional shares of our common stock issuable upon the automatic conversion of all outstanding shares of our preferred stock upon the closing of this offering.

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

- 3,695,065 shares of common stock issuable upon exercise of stock options outstanding as of May 31, 2013 at a weighted-average exercise price of $2.23 per share;
- 111,742 shares of common stock reserved as of May 31, 2013 for future issuance under our equity incentive plans; and
- 1,236,362 additional shares of our common stock that will be available for future issuance, as of the closing of this offering, under our 2013 stock incentive plan and our 2013 employee stock purchase plan.

Unless otherwise indicated, this prospectus reflects and assumes the following:

- the conversion of all outstanding shares of our preferred stock into an aggregate of 19,731,564 shares of our common stock, which will occur automatically immediately prior to the closing of the offering;
- no exercise of the outstanding options described above;
- the filing of our restated certificate of incorporation and the adoption of our amended and restated by-laws upon the closing of this offering;
- the issuance and sale of 708,333 shares of common stock in the concurrent private placement to an affiliate of Celgene at the public offering price of $18.00 per share; and
- no exercise by the underwriters of their over-allotment option.

In addition, unless otherwise indicated, all information in this prospectus gives effect to a 1-for-2.75 reverse stock split of our common stock that was effected on July 11, 2013.

Summary consolidated financial data

The following table summarizes our consolidated financial data. We have derived the following summary of our statement of operations data for the years ended December 31, 2011 and 2012 from our audited consolidated financial statements appearing elsewhere in this prospectus. We have derived the summary of our statement of operations data for the three months ended March 31, 2012 and 2013 and the balance sheet data as of March 31, 2013 from our unaudited consolidated financial statements appearing elsewhere in this prospectus. Our historical results are not necessarily indicative of future results. The summary of our consolidated financial data set forth below should be read together with our consolidated financial statements and the related notes to those statements, as well as "Management's discussion and analysis of financial condition and results of operations," appearing elsewhere in this prospectus.

	Years ended December 31,		Three months ended March 31,	
(in thousands, except share and per share data)	2011	2012	2012	2013
Consolidated Statement of Operations Data:				
Revenue	$ 21,837	$ 25,106	$ 6,268	$ 6,268
Operating expenses:				
Research and development	31,253	41,037	9,551	11,462
General and administrative	7,215	7,064	1,981	1,852
Total operating costs	38,468	48,101	11,532	13,314
Loss from operations	(16,631)	(22,995)	(5,264)	(7,046)
Investment income	132	69	26	8
Loss before provision (benefit) for income taxes	(16,499)	(22,926)	(5,238)	(7,038)
Provision (benefit) for income taxes	7,207	(2,824)	(607)	190
Net loss	(23,706)	(20,102)	(4,631)	(7,228)
Cumulative preferred stock dividends	(3,100)	(7,190)	(1,798)	(1,798)
Net loss applicable to common stockholders	$ (26,806)	$ (27,292)	$ (6,429)	$ (9,026)
Net loss per share applicable to common shareholders—basic and diluted	$ (8.90)	$ (8.02)	$ (1.98)	$ (2.47)
Weighted-average number of common shares used in net loss per share applicable to common stockholders—basic and diluted	3,013,366	3,401,719	3,246,844	3,658,016
Pro forma net loss per share applicable to common shareholders —basic and diluted(1)		$ (1.18)		$ (0.39)
Weighted-average number of common shares used in pro forma net loss per share applicable to common stockholders—basic and diluted		23,133,283		23,389,580

(1) Pro forma net loss per share applicable to common shareholders gives effect to the automatic conversion of all outstanding shares of our preferred stock into an aggregate of 19,731,564 shares of common stock upon the closing of this offering.

(in thousands)	As of March 31, 2013		
	Actual	Pro forma(1)	Pro forma as adjusted(2)
Consolidated balance sheet data:			
Cash, cash equivalents and marketable securities	$115,751	$115,751	$224,781
Total assets	$125,853	$125,853	$234,883
Total liabilities	$ 88,733	$ 88,733	$ 88,733
Convertible preferred stock	$115,922	$ —	$ —
Common stock	$ 3	$ 23	$ 30
Additional paid-in capital	$ 2,461	$118,363	$227,386
Accumulated deficit	$ (81,265)	$ (81,265)	$ (81,265)
Total stockholders' (deficit) equity	$ (78,802)	$ 37,120	$146,150

(1) The pro forma balance sheet data give effect to the automatic conversion of all outstanding shares of our preferred stock into an aggregate of 19,731,564 shares of common stock upon the closing of this offering.

(2) The pro forma as adjusted balance sheet data give effect to (i) our issuance and sale of 5,888,888 shares of common stock in this offering at the initial public offering price of $18.00 per share, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us and (ii) our issuance and sale of 708,333 shares of common stock in the concurrent private placement to an affiliate of Celgene at the public offering price of $18.00 per share.

Risk factors

Investing in our common stock involves a high degree of risk. Before investing in our common stock, you should consider carefully the risks described below, together with the other information contained in this prospectus, including our financial statements and the related notes appearing at the end of this prospectus. If any of the following risks occur, our business, financial condition, results of operations and future growth prospects could be materially and adversely affected. In these circumstances, the market price of our common stock could decline, and you may lose all or part of your investment.

Risks related to our financial position and need for additional capital

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

Since inception, we have incurred significant operating losses. Our net loss was $7.2 million, $20.1 million and $23.7 million for the three months ended March 31, 2013, and for the years ended December 31, 2012 and 2011, respectively. As of March 31, 2013, we had an accumulated deficit of $81.3 million. We have financed our operations primarily through private placements of our preferred stock and our collaboration with Celgene focused on cancer metabolism. We have devoted substantially all of our efforts to research and development. We have not initiated clinical development of any product candidates and expect that it will be many years, if ever, before we have a product candidate ready for commercialization. We expect to continue to incur significant expenses and increasing operating losses for the foreseeable future. The net losses we incur may fluctuate significantly from quarter to quarter. We anticipate that our expenses will increase substantially if and as we:

- continue our research and preclinical development of our product candidates;
- seek to identify additional product candidates;
- initiate clinical trials for our product candidates;
- seek marketing approvals for our product candidates that successfully complete clinical trials;
- ultimately establish a sales, marketing and distribution infrastructure to commercialize any medicines for which we may obtain marketing approval;
- maintain, expand and protect our intellectual property portfolio;
- hire additional clinical, quality control and scientific personnel;
- add operational, financial and management information systems and personnel, including personnel to support our product development; and
- acquire or in-license other medicines and technologies.

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

We will need substantial additional funding. If we are unable to raise capital when needed, we would be forced to delay, reduce or eliminate our product development programs or commercialization efforts.

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

We expect that the net proceeds from this offering and the concurrent private placement to an affiliate of Celgene, together with our existing cash, cash equivalents and marketable securities, anticipated interest income and anticipated expense reimbursements under our collaboration agreement with Celgene, will enable us to fund our operating expenses and capital expenditure requirements until at least the fourth quarter of 2016. Our future capital requirements will depend on many factors, including:

- the scope, progress, results and costs of drug discovery, preclinical development, laboratory testing and clinical trials for our product candidates;
- the success of our collaboration with Celgene;
- whether Celgene exercises either or both of its options to extend the discovery phase under our collaboration with Celgene (each of which would trigger an extension payment to us);
- the costs, timing and outcome of regulatory review of our product candidates;
- the costs of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending intellectual property-related claims;
- our ability to establish and maintain additional collaborations on favorable terms, if at all; and
- the extent to which we acquire or in-license other medicines and technologies.

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

Raising additional capital may cause dilution to our stockholders, including purchasers of common stock in this offering, restrict our operations or require us to relinquish rights to our technologies or product candidates.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of equity offerings, debt financings, collaborations, strategic alliances and licensing arrangements. We do not have any committed external source of funds, other than our collaboration with Celgene, which is limited in scope and duration. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends.

If we raise funds through additional collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

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

We are an early-stage company. We were founded in the second half of 2007 and commenced operations in late 2008. Our operations to date have been limited to organizing and staffing our company, business planning, raising capital, acquiring and developing our technology, identifying potential product candidates and undertaking preclinical studies of our most advanced product candidates. All of our product candidates are still in preclinical development. We have not yet demonstrated our ability to initiate or successfully complete any clinical trials, including large-scale, pivotal clinical trials, obtain marketing approvals, manufacture a commercial scale medicine, or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful commercialization. Typically, it takes about ten to 15 years to develop one new medicine from the time it is discovered to when it is available for treating patients. Consequently, any predictions you make about our future success or viability may not be as accurate as they could be if we had a longer operating history.

In addition, as a new business, we may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown factors. We will need to transition from a company with a research focus to a company capable of supporting commercial activities. We may not be successful in such a transition.

Risks related to the discovery, development and commercialization of our product candidates

Our approach to the discovery and development of product candidates that target cellular metabolism is unproven, and we do not know whether we will be able to develop any medicines of commercial value.

Our scientific approach focuses on using our proprietary technology to identify key metabolic enzymes in cancer, IEMs or other diseased cells in the laboratory and then using these key enzymes to screen for and identify product candidates targeting cellular metabolism.

Any medicines that we develop may not effectively correct metabolic pathways. Even if we are able to develop a product candidate that targets cellular metabolism in preclinical studies, we may not succeed in demonstrating safety and efficacy of the product candidate in human clinical trials. Our focus on using our proprietary technology to screen for and identify product candidates targeting cellular metabolism may not result in the discovery and development of commercially viable medicines to treat cancer or IEMs.

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

A key element of our strategy is to identify and test compounds that target cellular metabolism in a variety of different types of cancer and IEMs. A significant portion of the research that we are conducting involves new compounds and drug discovery methods, including our proprietary technology. The drug discovery that we are conducting using our proprietary technology may not be successful in identifying compounds that are useful in treating cancer or IEMs. Our research programs may initially show promise in identifying potential product candidates, yet fail to yield product candidates for clinical development for a number of reasons, including:

- the research methodology used may not be successful in identifying appropriate biomarkers or potential product candidates; or
- potential product candidates may, on further study, be shown to have harmful side effects or other characteristics that indicate that they are unlikely to be medicines that will receive marketing approval and achieve market acceptance.

Research programs to identify new product candidates require substantial technical, financial and human resources. We may choose to focus our efforts and resources on a potential product candidate that ultimately proves to be unsuccessful.

If we are unable to identify suitable compounds for preclinical and clinical development, we will not be able to obtain product revenues in future periods, which likely would result in significant harm to our financial position and adversely impact our stock price.

We depend heavily on the success of our most advanced product candidates. All of our product candidates are still in preclinical development. Preclinical testing and clinical trials of our product candidates may not be successful. If we are unable to commercialize our product candidates or experience significant delays in doing so, our business will be materially harmed.

We have invested a significant portion of our efforts and financial resources in the identification of our most advanced product candidates, AG-221 and AG-120 for the treatment of hematological and solid tumors and AG-348 for the treatment of PK deficiency. Our ability to generate product revenues, which we do not expect will occur for many years, if ever, will depend heavily on the successful development and eventual commercialization of these product candidates. The success of our product candidates will depend on many factors, including the following:

- successful enrollment in, and completion of, clinical trials;
- receipt of marketing approvals from applicable regulatory authorities;
- establishing commercial manufacturing capabilities or making arrangements with third-party manufacturers;
- obtaining and maintaining patent and trade secret protection and non-patent exclusivity for our medicines;
- launching commercial sales of the medicines, if and when approved, whether alone or in collaboration with others;
- acceptance of the medicines, if and when approved, by patients, the medical community and third-party payors;
- effectively competing with other therapies;
- a continued acceptable safety profile of the medicines following approval;
- enforcing and defending intellectual property rights and claims; and
- achieving desirable medicinal properties for the intended indications.

If we do not achieve one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully commercialize our product candidates, which would materially harm our business.

If clinical trials of our product candidates fail to demonstrate safety and efficacy 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 product candidates.

Before obtaining marketing approval from regulatory authorities for the sale of our product candidates, we must complete preclinical development and then conduct extensive clinical trials to demonstrate the safety and efficacy of our product 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.

Moreover, preclinical and clinical data are often susceptible to varying interpretations and analyses. Many companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their products.

We or our collaborators 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 product candidates, including:

- 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 product 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 product candidates may be larger than we anticipate; enrollment in these clinical trials, which may be particularly challenging for some of the orphan diseases we target in our IEM program, may be slower than we anticipate; or participants may drop out of these clinical trials at a higher rate than we anticipate;
- our 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 product candidates for various reasons, including a finding that the participants are being exposed to unacceptable health risks;
- regulators or institutional review boards 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 product candidates may be greater than we anticipate;
- the supply or quality of our product candidates or other materials necessary to conduct clinical trials of our product candidates may be insufficient or inadequate; and
- our product 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 collaborators are required to conduct additional clinical trials or other testing of our product candidates beyond those that we currently contemplate, if we or our collaborators are unable to successfully complete clinical trials of our product candidates or other testing, if the results of these trials or tests are not positive or are only modestly positive or if there are safety concerns, we or our collaborators may:

- be delayed in obtaining marketing approval for our product candidates;
- not obtain marketing approval at all;
- obtain approval for indications or patient populations that are not as broad as intended or desired;
- obtain approval with labeling that includes significant use or distribution restrictions or safety warnings, including boxed warnings;
- be subject to additional post-marketing testing requirements; or
- have the medicine removed from the market after obtaining marketing approval.

Product development costs will also increase if we or our collaborators 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 product candidates, could allow our competitors to bring products to market before we do, and could impair our ability to successfully commercialize our product candidates, any of which may harm our business and results of operations.

If we experience delays or difficulties in the enrollment of patients in clinical trials, our receipt of necessary regulatory approvals could be delayed or prevented.

We or our collaborators may not be able to initiate or continue clinical trials for our product candidates if we are unable to locate and enroll a sufficient number of eligible patients to participate in these trials as required by the FDA or analogous regulatory authorities outside the United States. Enrollment may be particularly challenging for some of the orphan diseases we target in our IEM program. In addition, some of our competitors may have ongoing clinical trials for product candidates that would treat the same indications as our product candidates, and patients who would otherwise be eligible for our clinical trials may instead enroll in clinical trials of our competitors' product candidates.

Patient enrollment is also affected by other factors including:

- severity of the disease under investigation;
- availability and efficacy of approved medications for the disease under investigation;
- eligibility criteria for the study in question;
- perceived risks and benefits of the product candidate under study;
- efforts to facilitate timely enrollment in clinical trials;
- patient referral practices of physicians;
- the ability to monitor patients adequately during and after treatment; and
- proximity and availability of clinical trial sites for prospective patients.

Our or our collaborators' inability to enroll a sufficient number of patients for our clinical trials would result in significant delays or may require us to abandon one or more clinical trials altogether. Enrollment delays in our clinical trials may result in increased development costs for our product candidates, which would cause the value of our company to decline and limit our ability to obtain additional financing.

If serious adverse side effects or unexpected characteristics are identified during the development of our product candidates, we may need to abandon or limit our development of some of our product candidates.

All of our product candidates are still in preclinical development and their risk of failure is high. It is impossible to predict when or if any of our product candidates will prove effective or safe in humans or will receive marketing approval. If our product candidates are associated with undesirable side effects or have characteristics that are unexpected, we may need to abandon their development or limit development to certain uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective. Many compounds that initially showed promise in early stage testing for treating cancer or other diseases have later been found to cause side effects that prevented further development of the compound.

We may expend our limited resources to pursue a particular product candidate or indication and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we focus on research programs and product candidates that we identify for specific indications. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial medicines or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable medicines. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate.

Under our collaboration agreement with Celgene, we have the right, exercisable during a specified period following FDA acceptance of the applicable investigational new drug application, or IND, to convert one of every three co-commercialized licensed programs into a split licensed program, for which we retain the United States rights. Our IDH2 program will not be a split licensed program. Due to the limited exercise period, we may have to choose whether a co-commercialized program will be a split licensed program before we have as much information as we would like on another co-commercialized program, including whether and when such program may receive FDA acceptance of the applicable IND. As a result of such incomplete information or due to incorrect analysis by us, we may select a split licensed program that later proves to have less commercial potential than an alternative or none at all.

If we are unable to successfully develop companion diagnostics for our therapeutic product candidates, or experience significant delays in doing so, we may not realize the full commercial potential of our therapeutics.

Because we are focused on precision medicine, in which predictive biomarkers will be used to identify the right patients for our drug candidates, we believe that our success may depend, in part, on our ability to develop companion diagnostics, which are assays or tests to identify an appropriate patient population for these drug candidates. There has been limited success to date industrywide in developing these types of companion diagnostics. To be successful, we need to address a number of scientific, technical and logistical challenges. We have not yet initiated development of companion diagnostics. We have little experience in the development of diagnostics and may not be successful in developing appropriate diagnostics to pair with any of our therapeutic product candidates that receive marketing approval. Companion diagnostics are subject to regulation by the FDA and similar regulatory authorities outside the United States as medical devices and require separate regulatory approval prior to commercialization. Given our limited experience in developing diagnostics, we expect to rely in part or in whole on third parties for their design and manufacture. If we, or any third parties that we engage to assist us, are unable to successfully develop companion diagnostics for our therapeutic product candidates, or experience delays in doing so:

- the development of our therapeutic product candidates may be adversely affected if we are unable to appropriately select patients for enrollment in our clinical trials;
- our therapeutic product candidates may not receive marketing approval if safe and effective use of a therapeutic product candidate depends on an *in vitro* diagnostic; and
- we may not realize the full commercial potential of any therapeutics that receive marketing approval if, among other reasons, we are unable to appropriately select patients who are likely to benefit from therapy with our medicines.

As a result, our business would be harmed, possibly materially.

Even if any of our product candidates receive marketing approval, they may fail to achieve the degree of market acceptance by physicians, patients, healthcare payors and others in the medical community necessary for commercial success.

If any of our product candidates receive marketing approval, they may nonetheless fail to gain sufficient market acceptance by physicians, patients, healthcare payors and others in the medical community. For example, current cancer treatments like chemotherapy and radiation therapy are well established in the medical community, and doctors may continue to rely on these treatments. If our product candidates do not achieve an adequate level of acceptance, we may not generate significant product revenues and we may not become profitable. The degree of market acceptance of our product candidates, if approved for commercial sale, will depend on a number of factors, including:

- efficacy and potential advantages compared to alternative treatments;
- the ability to offer our medicines for sale at competitive prices;
- convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the strength of marketing and distribution support;
- sufficient third-party coverage or reimbursement; and
- the prevalence and severity of any side effects.

If, in the future, we are unable to establish sales and marketing capabilities or enter into agreements with third parties to sell and market our product candidates, we may not be successful in commercializing our product candidates if and when they are approved.

We do not have a sales or marketing infrastructure and have no experience in the sale, marketing or distribution of pharmaceutical products. To achieve commercial success for any approved medicine for which we retain sales and marketing responsibilities, we must either develop a sales and marketing organization or outsource these functions to other third parties. In the future, we may choose to build a focused sales and marketing infrastructure to sell, or participate in sales activities with our collaborators for, some of our product candidates if and when they are approved.

There are risks involved with both establishing our own sales and marketing capabilities and entering into arrangements with third parties to perform these services. For example, recruiting and training a sales force is expensive and time consuming and could delay any product launch. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we cannot retain or reposition our sales and marketing personnel.

Factors that may inhibit our efforts to commercialize our medicines on our own include:

- our inability to recruit and retain adequate numbers of effective sales and marketing personnel;
- the inability of sales personnel to obtain access to physicians or persuade adequate numbers of physicians to prescribe any future medicines;
- the lack of complementary medicines to be offered by sales personnel, which may put us at a competitive disadvantage relative to companies with more extensive product lines; and
- unforeseen costs and expenses associated with creating an independent sales and marketing organization.

If we enter into arrangements with third parties to perform sales, marketing and distribution services, our product revenues or the profitability of these product revenues to us are likely to be lower than if we were to market and sell any medicines that we develop ourselves. In addition, we may not be successful in entering into arrangements with third parties to sell and market our product candidates or may be unable to do so on terms that are favorable to us. We likely will have little control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market our medicines effectively. If we do not establish sales and marketing capabilities successfully, either on our own or in collaboration with third parties, we will not be successful in commercializing our product candidates.

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

The development and commercialization of new drug products is highly competitive. We face competition with respect to our current product candidates, and will face competition with respect to any product candidates that we may seek to develop or commercialize in the future, from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide. There are a number of large pharmaceutical and biotechnology companies that currently market and sell products or are pursuing the development of products for the treatment of the disease indications for which we are developing our product candidates, such as acute myelogenous leukemia and high risk myelodysplasia. Some of these competitive products and therapies are based on scientific approaches that are the same as or similar to our approach, and others are based on entirely different approaches, for example, in the area of IEMs. Potential competitors also include academic institutions, government agencies and other public and private research organizations that conduct research, seek patent protection and establish collaborative arrangements for research, development, manufacturing and commercialization.

We are developing our initial product candidates for the treatment of cancer. There are a variety of available drug therapies marketed for cancer. In many cases, these drugs are administered in combination to enhance efficacy, and cancer drugs are frequently prescribed off-label by healthcare professionals. Some of the currently approved drug therapies are branded and subject to patent protection, and others are available on a generic basis. Many of these approved drugs are well established therapies and are widely accepted by physicians, patients and third-party payors. Insurers and other third-party payors may also encourage the use of generic products. We expect that if our product candidates are approved, they will be priced at a significant premium over competitive generic products. This may make it difficult for us to achieve our business strategy of using our product candidates in combination with existing therapies or replacing existing therapies with our product candidates.

We are also pursuing product candidates to treat patients with IEMs. There are a variety of treatment options available, including a number of marketed enzyme replacement therapies, for treating patients with IEMs. In addition to currently marketed therapies, there are also a number of products that are either enzyme replacement therapies or gene therapies in various stages of clinical development to treat IEMs. These products in development may provide efficacy, safety, convenience and other benefits that are not provided by currently marketed therapies. As a result, they may provide significant competition for any of our product candidates for which we obtain market approval.

There are also a number of product candidates in preclinical development by third parties to treat cancer and IEMs by targeting cellular metabolism. These companies include large pharmaceutical companies, including AstraZeneca plc, Eli Lilly and Company, Roche Holdings Inc. and its subsidiary Genentech, Inc., GlaxoSmithKline plc, Novartis International AG, Pfizer, Inc., and Genzyme, a Sanofi company. There are also biotechnology companies of various size that are developing therapies to target cellular metabolism, including Alexion Pharmaceuticals, Inc., BioMarin Pharmaceutical Inc., Calithera Biosciences, Inc., Cornerstone Pharmaceuticals, Inc., Forma Therapeutics Holdings LLC, and Shire Biochem Inc. Our competitors may develop products that are more effective, safer, more convenient or less costly than any that we are developing or that would render our product candidates obsolete or non-competitive. In addition, our competitors may discover

biomarkers that more efficiently measure metabolic pathways than our methods, which may give them a competitive advantage in developing potential products. Our competitors may also obtain marketing approval from the FDA or other regulatory authorities for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market.

Many of our competitors have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller and other early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These third parties compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

Even if we are able to commercialize any product candidates, such products may become subject to unfavorable pricing regulations, third-party reimbursement practices or healthcare reform initiatives, which would harm our business.

The regulations that govern marketing approvals, pricing and reimbursement for new medicines vary widely from country to country. In the United States, recently enacted legislation may significantly change the approval requirements in ways that could involve additional costs and cause delays in obtaining approvals. Some countries require approval of the sale price of a medicine before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain marketing approval for a medicine in a particular country, but then be subject to price regulations that delay our commercial launch of the medicine, possibly for lengthy time periods, and negatively impact the revenues we are able to generate from the sale of the medicine in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if our product candidates obtain marketing approval.

Our ability to commercialize any medicines successfully also will depend in part on the extent to which reimbursement for these medicines and related treatments will be available from government health administration authorities, private health insurers and other organizations. Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which medications they will pay for and establish reimbursement levels. A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Government authorities and third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. We cannot be sure that reimbursement will be available for any medicine that we commercialize and, if reimbursement is available, the level of reimbursement. Reimbursement may impact the demand for, or the price of, any product candidate for which we obtain marketing approval. If reimbursement is not available or is available only to limited levels, we may not be able to successfully commercialize any product candidate for which we obtain marketing approval.

There may be significant delays in obtaining reimbursement for newly approved medicines, and coverage may be more limited than the purposes for which the medicine is approved by the FDA or similar regulatory authorities outside the United States. Moreover, eligibility for reimbursement does not imply that any medicine will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution. Interim reimbursement levels for new medicines, if applicable, may also not be sufficient to cover our costs and may not be made permanent. Reimbursement rates may vary according to the use of the medicine and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost

medicines and may be incorporated into existing payments for other services. Net prices for medicines may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of medicines from countries where they may be sold at lower prices than in the United States. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement policies. Our inability to promptly obtain coverage and profitable payment rates from both government-funded and private payors for any approved medicines that we develop could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize medicines and our overall financial condition.

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

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

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

Although we maintain product liability insurance coverage, it may not be adequate to cover all liabilities that we may incur. We anticipate that we will need to increase our insurance coverage when we begin clinical trials and if we successfully commercialize any medicine. Insurance coverage is increasingly expensive. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise.

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

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and biological and radioactive materials. Our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials. In the event of contamination or injury resulting from our use of hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties.

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

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

Risks related to our dependence on third parties

We depend on our collaboration with Celgene and may depend on collaborations with additional third parties for the development and commercialization of our product candidates. If those collaborations are not successful, we may not be able to capitalize on the market potential of these product candidates.

In April 2010, we entered into our collaboration with Celgene focused on cancer metabolism. The collaboration involves a complex allocation of rights, provides for milestone payments to us based on the achievement of specified clinical development, regulatory and commercial milestones, provides for additional payments upon Celgene's election to extend the term of the discovery phase and provides us with royalty-based revenue if certain product candidates are successfully commercialized. We cannot predict the success of the collaboration.

We may seek other third-party collaborators for the development and commercialization of our product candidates. Our likely collaborators for any collaboration arrangements include large and mid-size pharmaceutical companies, regional and national pharmaceutical companies and biotechnology companies. If we enter into any such arrangements with any third parties, we will likely have limited control over the amount and timing of resources that our collaborators dedicate to the development or commercialization of our product candidates. Our ability to generate revenues from these arrangements will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements.

Collaborations involving our product candidates, including our collaboration with Celgene, pose the following risks to us:

- Collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations. For example, under our collaboration with Celgene, development and commercialization plans and strategies for licensed programs will be conducted in accordance with a plan and budget approved by a joint committee comprised of equal numbers of representatives from each of us and Celgene.
- Collaborators may not pursue development and commercialization of our product candidates or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in the collaborator's strategic focus or available funding or external factors such as an acquisition that diverts resources or creates competing priorities. For example, it is possible for Celgene to elect not to progress into preclinical development a product candidate that we have nominated and the joint research committee, or JRC, confirmed, without triggering a termination of the collaboration arrangement.
- Collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing. For example, under our agreement with Celgene, it is possible for Celgene to terminate the agreement, upon 90 days prior written notice, with respect to any product candidate at any point in the research, development and clinical trial process, without triggering a termination of the remainder of the collaboration arrangement.
- Collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our medicines or product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours.
- A collaborator with marketing and distribution rights to one or more medicines may not commit sufficient resources to the marketing and distribution of such medicine or medicines.

- Collaborators may not properly maintain or defend our intellectual property rights or may use our proprietary information in such a way as to invite litigation that could jeopardize or invalidate our proprietary information or expose us to potential litigation. For example, Celgene has the first right to maintain or defend our intellectual property rights under our collaboration arrangement with respect to certain licensed programs and, although we may have the right to assume the maintenance and defense of our intellectual property rights if Celgene does not, our ability to do so may be compromised by Celgene's actions.
- Disputes may arise between the collaborators and us that result in the delay or termination of the research, development or commercialization of our medicines or product candidates or that result in costly litigation or arbitration that diverts management attention and resources.
- We may lose certain valuable rights under circumstances identified in our collaborations, including, in the case of our agreement with Celgene, if we undergo a change of control.
- Collaborations may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates. For example, Celgene can terminate its agreement with us, in its entirety or with respect to any program, upon 90 days' notice and can terminate the entire agreement with us in connection with a material breach of the agreement by us that remains uncured for 60 days.
- Collaboration agreements may not lead to development or commercialization of product candidates in the most efficient manner or at all. If a present or future collaborator of ours were to be involved in a business combination, the continued pursuit and emphasis on our product development or commercialization program under such collaboration could be delayed, diminished or terminated.

We may seek to establish additional collaborations, and, if we are not able to establish them on commercially reasonable terms, we may have to alter our development and commercialization plans.

Our drug development programs and the potential commercialization of our product candidates will require substantial additional cash to fund expenses. For some of our product candidates, we may decide to collaborate with additional pharmaceutical and biotechnology companies for the development and potential commercialization of those product candidates.

We face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors. Those factors may include the design or results of clinical trials, the likelihood of approval by the FDA or similar regulatory authorities outside the United States, the potential market for the subject product candidate, the costs and complexities of manufacturing and delivering such product candidate to patients, the potential of competing products, the existence of uncertainty with respect to our ownership of technology, which can exist if there is a challenge to such ownership without regard to the merits of the challenge and industry and market conditions generally. The collaborator may also consider alternative product candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us for our product candidate.

We may also be restricted under existing collaboration agreements from entering into future agreements on certain terms with potential collaborators. For example, during the discovery phase of our collaboration with Celgene, we may not directly or indirectly develop, manufacture or commercialize, except pursuant to the agreement, any medicine or product candidate for any cancer indication: with specified activity against certain metabolic targets except in connection with certain third party collaborations; or with specified activity against any collaboration target, or any target for which Celgene is conducting an independent program that we elected not to buy in to. Following the discovery phase until termination or expiration of the agreement, either in its entirety or with respect to the relevant program, we may not directly or indirectly develop, manufacture or

commercialize, outside of the collaboration, any medicine or product candidate with specified activity against any collaboration target that is within a licensed program or against any former collaboration target against which Celgene is conducting an independent program under the agreement.

Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators.

We may not be able to negotiate collaborations on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to curtail the development of the product candidate for which we are seeking to collaborate, reduce or delay its development program or one or more of our other development programs, delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further develop our product candidates or bring them to market and generate product revenue.

We expect to rely on third parties to conduct our clinical trials and some aspects of our research and preclinical testing, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials, research or testing.

We expect to rely on third parties, such as contract research organizations, clinical data management organizations, medical institutions and clinical investigators, to conduct our clinical trials. We currently rely and expect to continue to rely on third parties to conduct some aspects of our research and preclinical testing. Any of these third parties may terminate their engagements with us at any time. If we need to enter into alternative arrangements, it would delay our product development activities.

Our reliance on these third parties for research and development activities will reduce our control over these activities but will not relieve us of our responsibilities. For example, we will remain responsible for ensuring that each of our clinical trials is conducted in accordance with the general investigational plan and protocols for the trial. Moreover, the FDA requires us to comply with standards, commonly referred to as Good Clinical Practices, for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of trial participants are protected. We also are required to register ongoing clinical trials and post the results of completed clinical trials on a government-sponsored database, ClinicalTrials.gov, within certain timeframes. Failure to do so can result in fines, adverse publicity and civil and criminal sanctions.

Furthermore, these third parties may also have relationships with other entities, some of which may be our competitors. If these third parties do not successfully carry out their contractual duties, meet expected deadlines or conduct our clinical trials in accordance with regulatory requirements or our stated protocols, we will not be able to obtain, or may be delayed in obtaining, marketing approvals for our product candidates and will not be able to, or may be delayed in our efforts to, successfully commercialize our medicines.

We also expect to rely on other third parties to store and distribute drug supplies for our clinical trials. Any performance failure on the part of our distributors could delay clinical development or marketing approval of our product candidates or commercialization of our medicines, producing additional losses and depriving us of potential product revenue.

We contract with third parties for the manufacture of our product candidates for preclinical testing and expect to continue to do so for clinical trials and for commercialization. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates or medicines or that such supply will not be available to us at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.

We do not have any manufacturing facilities. We currently rely, and expect to continue to rely, on third-party manufacturers for the manufacture of our product candidates for preclinical and clinical testing and for commercial supply of any of these product candidates for which we or our collaborators obtain marketing approval. To date, we have obtained materials for AG-221 for our planned phase 1 testing from third party manufacturers. We have engaged third party manufacturers to obtain the active ingredient for AG-120 for pre-clinical and clinical testing. We do not have a long term supply agreement with the third-party manufacturers, and we purchase our required drug supply on a purchase order basis.

We may be unable to establish any agreements with third-party manufacturers or to do so on acceptable terms. Even if we are able to establish agreements with third-party manufacturers, reliance on third-party manufacturers entails additional risks, including:

- reliance on the third party for regulatory compliance and quality assurance;
- the possible breach of the manufacturing agreement by the third party;
- the possible termination or nonrenewal of the agreement by the third party at a time that is costly or inconvenient for us; and
- reliance on the third party for regulatory compliance, quality assurance, and safety and pharmacovigilance reporting.

Third-party manufacturers may not be able to comply with current good manufacturing practices, or cGMP, regulations or similar regulatory requirements outside the United States. Our failure, or the failure of our third-party manufacturers, to comply with applicable regulations could result in sanctions being imposed on us, including fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of product candidates or medicines, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of our medicines and harm our business and results of operations.

Any medicines that we may develop may compete with other product candidates and products for access to manufacturing facilities. There are a limited number of manufacturers that operate under cGMP regulations and that might be capable of manufacturing for us.

Any performance failure on the part of our existing or future manufacturers could delay clinical development or marketing approval. We do not currently have arrangements in place for redundant supply for bulk drug substances. If any one of our current contract manufacturer cannot perform as agreed, we may be required to replace that manufacturer. Although we believe that there are several potential alternative manufacturers who could manufacture our product candidates, we may incur added costs and delays in identifying and qualifying any such replacement.

Our current and anticipated future dependence upon others for the manufacture of our product candidates or medicines may adversely affect our future profit margins and our ability to commercialize any medicines that receive marketing approval on a timely and competitive basis.

Risks related to our intellectual property

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

Our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries with respect to our proprietary medicines and technology. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our novel technologies and medicines that are important to our business. To date, we do not own or have any rights to any issued patents that cover any of our proprietary technology or product candidates, and we cannot be certain that we will secure any rights to any issued patents with claims that cover any of our proprietary technology or product candidates.

The patent prosecution process is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. Although we enter into non-disclosure and confidentiality agreements with parties who have access to patentable aspects of our research and development output, such as our employees, corporate collaborators, outside scientific collaborators, contract research organizations, contract manufacturers, consultants, advisors and other third parties, any of these parties may breach the agreements and disclose such output before a patent application is filed, thereby jeopardizing our ability to seek patent protection.

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

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

The laws of foreign countries may not protect our rights to the same extent as the laws of the United States. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore we cannot be certain that we were the first to make the inventions claimed in our owned or any licensed patents or pending patent applications, or that we were the first to file for patent protection of such inventions.

Assuming the other requirements for patentability are met, prior to March 2013, in the United States, the first to make the claimed invention was entitled to the patent, while outside the United States, the first to file a patent application was entitled to the patent. Beginning in March 2013, the United States transitioned to a first inventor to file system in which, assuming the other requirements for patentability are met, the first inventor to file a patent application will be entitled to the patent. We may be subject to a third party preissuance submission of prior art to the U.S. Patent and Trademark Office, or become involved in opposition, derivation, revocation, reexamination, post-grant and *inter partes* review or interference proceedings challenging our patent rights or the

patent rights of others. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our technology or products and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize medicines without infringing third-party patent rights.

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

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

We may become involved in lawsuits to protect or enforce our patents and other intellectual property rights, which could be expensive, time consuming and unsuccessful.

Competitors may infringe our patents and other intellectual property rights. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time consuming. In addition, in an infringement proceeding, a court may decide that a patent of ours is invalid or unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation proceeding could put one or more of our patents at risk of being invalidated or interpreted narrowly. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation.

Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which would be uncertain and could have a material adverse effect on the success of our business.

Our commercial success depends upon our ability and the ability of our collaborators to develop, manufacture, market and sell our product candidates and use our proprietary technologies without infringing the proprietary rights and intellectual property of third parties. The biotechnology and pharmaceutical industries are characterized by extensive litigation regarding patents and other intellectual property rights. We have in the past and may in the future become party to, or threatened with, adversarial proceedings or litigation regarding intellectual property rights with respect to our medicines and technology, including interference proceedings before the U.S. Patent and Trademark Office. For example, in 2011, The Leonard and Madlyn Abramson Family Cancer Research Institute at the Abramson Cancer Center of the University of Pennsylvania initiated a lawsuit against us, one of our founders, Craig B Thompson, M.D., and Celgene, alleging misappropriation of intellectual property and, in 2012, the Trustees of the University of Pennsylvania initiated a similar lawsuit against us and Dr. Thompson. Each of these lawsuits was settled in 2012. No other legal proceedings have been filed against us to date. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future. If we are found to infringe a third party's intellectual property rights, we could be required to obtain a license from such third party to continue developing and marketing our medicines and technology. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors and other third parties access to the same technologies licensed to us. We could be forced, including by court order, to cease developing and commercializing the infringing technology or medicine. In addition, we could be found liable for monetary

damages. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially harm our business. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

We may be subject to claims that our employees, consultants or advisors have wrongfully used or disclosed alleged trade secrets of their current or former employers.

Many of our employees, consultants or advisors are currently or were previously employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees, consultants and advisors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or these individuals have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such individual's current or former employer. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management. Other than the litigation initiated by the Leonard and Madlyn Abramson Family Cancer Research Institute at the Abramson Cancer Center of the University of Pennsylvania and by the Trustees of the University of Pennsylvania described above, no such claims have been filed against us to date.

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

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

If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.

In addition to seeking patents for some of our technology and medicines, we also rely on trade secrets, including unpatented know-how, technology and other proprietary information, to maintain our competitive position. With respect to our proprietary cellular metabolism technology platform, we consider trade secrets and know-how to be our primary intellectual property. Trade secrets and know-how can be difficult to protect. In particular, we anticipate that with respect to this technology platform, these trade secrets and know-how will over time be disseminated within the industry through independent development, the publication of journal articles describing the methodology, and the movement of personnel skilled in the art from academic to industry scientific positions.

We seek to protect these trade secrets, in part, by entering into non-disclosure and confidentiality agreements with parties who have access to them, such as our employees, corporate collaborators, outside scientific collaborators, contract research organizations, contract manufacturers, consultants, advisors and other third parties. We also enter into confidentiality and invention or patent assignment agreements with our employees and consultants. Despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. If any of our trade secrets were to be lawfully obtained or

independently developed by a competitor or other third party, we would have no right to prevent them from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor or other third party, our competitive position would be harmed.

Risks related to regulatory approval of our product candidates and other legal compliance matters

If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals, we will not be able to commercialize, or will be delayed in commercializing, our product candidates, and our ability to generate revenue will be materially impaired.

Our product candidates and the activities associated with their development and commercialization, including their design, testing, manufacture, safety, efficacy, recordkeeping, labeling, storage, approval, advertising, promotion, sale and distribution, are subject to comprehensive regulation by the FDA and other regulatory agencies in the United States and by comparable authorities in other countries. Failure to obtain marketing approval for a product candidate will prevent us from commercializing the product candidate. We have not received approval to market any of our product candidates from regulatory authorities in any jurisdiction. We have only limited experience in filing and supporting the applications necessary to gain marketing approvals and expect to rely on third-party contract research organizations to assist us in this process. Securing regulatory approval requires the submission of extensive preclinical and clinical data and supporting information to the various regulatory authorities for each therapeutic indication to establish the product candidate's safety and efficacy. Securing regulatory approval also requires the submission of information about the product manufacturing process to, and inspection of manufacturing facilities by, the relevant regulatory authority. Our product candidates may not be effective, may be only moderately effective or may prove to have undesirable or unintended side effects, toxicities or other characteristics that may preclude our obtaining marketing approval or prevent or limit commercial use.

The process of obtaining marketing approvals, both in the United States and abroad, is expensive, may take many years if additional clinical trials are required, if approval is obtained at all, and can vary substantially based upon a variety of factors, including the type, complexity and novelty of the product candidates involved. Changes in marketing approval policies during the development period, changes in or the enactment of additional statutes or regulations, or changes in regulatory review for each submitted product application, may cause delays in the approval or rejection of an application. The FDA and comparable authorities in other countries have substantial discretion in the approval process and may refuse to accept any application or may decide that our data is insufficient for approval and require additional preclinical, clinical or other studies. In addition, varying interpretations of the data obtained from preclinical and clinical testing could delay, limit or prevent marketing approval of a product candidate. Any marketing approval we ultimately obtain may be limited or subject to restrictions or post-approval commitments that render the approved medicine not commercially viable.

If we experience delays in obtaining approval or if we fail to obtain approval of our product candidates, the commercial prospects for our product candidates may be harmed and our ability to generate revenues will be materially impaired.

Failure to obtain marketing approval in international jurisdictions would prevent our medicines from being marketed in such jurisdictions.

In order to market and sell our medicines in the European Union and many other jurisdictions, we or our third-party collaborators must obtain separate marketing approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval may differ substantially from that required to obtain FDA approval. The regulatory approval process outside the United States generally includes all of the risks associated with obtaining FDA approval. In addition, in many countries outside the United States, it is required that the product be approved for reimbursement before the product can be approved for sale in that country. We or these third parties may not obtain approvals from regulatory authorities outside the United States on a timely basis, if at all. Approval by the

FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority outside the United States does not ensure approval by regulatory authorities in other countries or jurisdictions or by the FDA. We may not be able to file for marketing approvals and may not receive necessary approvals to commercialize our medicines in any market.

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

Any product candidate for which we obtain marketing approval, along with the manufacturing processes, post-approval clinical data, labeling, advertising and promotional activities for such medicine, will be subject to continual requirements of and review by the FDA and other regulatory authorities. These requirements include submissions of safety and other post-marketing information and reports, registration and listing requirements, cGMP requirements relating to quality control, quality assurance and corresponding maintenance of records and documents, and requirements regarding the distribution of samples to physicians and recordkeeping. Even if marketing approval of a product candidate is granted, the approval may be subject to limitations on the indicated uses for which the medicine may be marketed or to the conditions of approval, or contain requirements for costly post-marketing testing and surveillance to monitor the safety or efficacy of the medicine. The FDA closely regulates the post-approval marketing and promotion of medicines to ensure that they are marketed only for the approved indications and in accordance with the provisions of the approved labeling. The FDA imposes stringent restrictions on manufacturers' communications regarding off-label use and if we do not market our medicines for their approved indications, we may be subject to enforcement action for off-label marketing.

In addition, later discovery of previously unknown problems with our medicines, manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may yield various results, including:

- restrictions on such medicines, manufacturers or manufacturing processes;
- restrictions on the labeling or marketing of a medicine;
- restrictions on distribution or use of a medicine;
- requirements to conduct post-marketing clinical trials;
- warning or untitled letters;
- withdrawal of the medicines from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- recall of medicines;
- fines, restitution or disgorgement of profits or revenue;
- suspension or withdrawal of marketing approvals;
- refusal to permit the import or export of our medicines;
- product seizure; and
- injunctions or the imposition of civil or criminal penalties.

Our relationships with customers and third-party payors will be subject to applicable anti-kickback, fraud and abuse and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm and diminished profits and future earnings.

Healthcare providers, physicians and third-party payors play a primary role in the recommendation and prescription of any product candidates for which we obtain marketing approval. Our future arrangements with

third-party payors and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we market, sell and distribute our medicines for which we obtain marketing approval. Restrictions under applicable federal and state healthcare laws and regulations, include the following:

- the federal healthcare anti-kickback statute prohibits, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under federal and state healthcare programs such as Medicare and Medicaid;
- the federal False Claims Act imposes criminal and civil penalties, including civil whistleblower or qui tam actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government;
- the federal Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act, imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program and also imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;
- the federal false statements statute prohibits knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement in connection with the delivery of or payment for healthcare benefits, items or services;
- the federal transparency requirements under the Affordable Care Act requires manufacturers of drugs, devices, biologics and medical supplies to report to the Department of Health and Human Services information related to physician payments and other transfers of value and physician ownership and investment interests; and
- analogous state laws and regulations, such as state anti-kickback and false claims laws, may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, and some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government in addition to requiring drug manufacturers to report information related to payments to physicians and other health care providers or marketing expenditures.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, exclusion from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations. If any of the physicians or other providers or entities with whom we expect to do business are found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

Recently enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize our product candidates and affect the prices we may obtain.

In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of

our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any product candidates for which we obtain marketing approval.

In the United States, the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, or Medicare Modernization Act, changed the way Medicare covers and pays for pharmaceutical products. The legislation expanded Medicare coverage for drug purchases by the elderly and introduced a new reimbursement methodology based on average sales prices for physician administered drugs. In addition, this legislation provided authority for limiting the number of drugs that will be covered in any therapeutic class. Cost reduction initiatives and other provisions of this legislation could decrease the coverage and price that we receive for any approved products. While the Medicare Modernization Act applies only to drug benefits for Medicare beneficiaries, private payors often follow Medicare coverage policy and payment limitations in setting their own reimbursement rates. Therefore, any reduction in reimbursement that results from the Medicare Modernization Act may result in a similar reduction in payments from private payors.

More recently, in March 2010, President Obama signed into law the Affordable Care Act, a sweeping law intended to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against fraud and abuse, add new transparency requirements for health care and health insurance industries, impose new taxes and fees on the health industry and impose additional health policy reforms. Effective October 1, 2010, the Affordable Care Act revises the definition of "average manufacturer price" for reporting purposes, which could increase the amount of Medicaid drug rebates to states. Further, the new law imposes a significant annual fee on companies that manufacture or import branded prescription drug products. Substantial new provisions affecting compliance have also been enacted, which may affect our business practices with health care practitioners. We will not know the full effects of the Affordable Care Act until applicable federal and state agencies issue regulations or guidance under the new law. Although it is too early to determine the effect of the Affordable Care Act, the new law appears likely to continue the pressure on pharmaceutical pricing, especially under the Medicare program, and may also increase our regulatory burdens and operating costs.

Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We cannot be sure whether additional legislative changes will be enacted, or whether the FDA regulations, guidance or interpretations will be changed, or what the impact of such changes on the marketing approvals of our product candidates, if any, may be. In addition, increased scrutiny by the U.S. Congress of the FDA's approval process may significantly delay or prevent marketing approval, as well as subject us to more stringent product labeling and post-marketing testing and other requirements.

Risks related to employee matters and managing growth

Our future success depends on our ability to retain our chief executive officer and other key executives and to attract, retain and motivate qualified personnel.

We are highly dependent on David Schenkein, M.D., our chief executive officer, J. Duncan Higgons, our chief operating officer, and Scott Biller, Ph.D., our chief scientific officer, as well as the other principal members of our management and scientific teams. Drs. Schenkein and Biller, and Mr. Higgons are employed "at will," meaning we or they may terminate the employment relationship at any time. We do not maintain "key person" insurance for any of our executives or other employees. The loss of the services of any of these persons could impede the achievement of our research, development and commercialization objectives.

Recruiting and retaining qualified scientific, clinical, manufacturing and 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, including our scientific co-founders, 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.

We expect to expand our development, regulatory and future sales and marketing capabilities, and as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.

We expect to experience significant growth in the number of our employees and the scope of our operations, particularly in the areas of drug development, regulatory affairs and sales and marketing. To manage our anticipated future growth, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such anticipated growth, we may not be able to effectively manage the expected expansion of our operations or recruit and train additional qualified personnel. Moreover, the expected physical expansion of our operations may lead to significant costs and may divert our management and business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

Risks related to our common stock and this offering

After this offering and the concurrent private placement of common stock to an affiliate of Celgene, our executive officers, directors and principal stockholders will maintain the ability to control all matters submitted to stockholders for approval.

Assuming our sale of 5,888,888 shares of common stock in this offering and our sale of 708,333 shares in the concurrent private placement of common stock to an affiliate of Celgene, the number of shares of our common stock owned by our executive officers, directors and stockholders who each owned more than 5% of our outstanding common stock before this offering and the concurrent private placement will, in the aggregate, equal approximately 71% of our capital stock (based on shares held prior to the offering). As a result, if these stockholders were to choose to act together, they would be able to control all matters submitted to our stockholders for approval, as well as our management and affairs. For example, these persons, if they choose to act together, would control the election of directors and approval of any merger, consolidation or sale of all or substantially all of our assets. This concentration of voting power could delay or prevent an acquisition of our company on terms that other stockholders may desire.

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

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

- establish a classified board of directors such that not all members of the board are elected at one time;
- allow the authorized number of our directors to be changed only by resolution of our board of directors;

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

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner.

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

The initial public offering price of our common stock is substantially higher than the net tangible book value per share of our common stock. Therefore, if you purchase shares of our common stock in this offering, you will pay a price per share that substantially exceeds our net tangible book value per share after giving effect to this offering and the concurrent private placement to an affiliate of Celgene. To the extent shares are issued under outstanding options, you will incur further dilution. Based on the initial public offering price of $18.00 per share, you will experience immediate dilution of $13.13 per share, representing the difference between our pro forma net tangible book value per share after giving effect to this offering and the concurrent private placement at the initial public offering price. In addition, purchasers of common stock in this offering will have contributed approximately 44% of the aggregate price paid by all purchasers of our stock but will own only approximately 20% of our common stock outstanding after this offering and the concurrent private placement.

An active trading market for our common stock may not develop.

Prior to this offering, there has been no public market for our common stock. The initial public offering price for our common stock will be determined through negotiations with the underwriters. Although our common stock has been approved for listing on The NASDAQ Global Select Market, an active trading market for our shares may never develop or be sustained following this offering. If an active market for our common stock does not develop, it may be difficult for you to sell shares you purchase in this offering without depressing the market price for the shares or at all.

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

The trading market for our common stock will rely in part on the research and reports that industry or financial analysts publish about us or our business. We may never obtain research coverage by industry or financial analysts. If no or few analysts commence coverage of us, the trading price of our stock would likely decrease. Even if we do obtain analyst coverage, if one or more of the analysts covering our business downgrade their

evaluations of our stock, the price of our stock could decline. If one or more of these analysts cease to cover our stock, we could lose visibility in the market for our stock, which in turn could cause our stock price to decline.

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

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

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

We have broad discretion in the use of the net proceeds from this offering and the concurrent private placement of common stock to an affiliate of Celgene and may not use them effectively.

Our management will have broad discretion in the application of the net proceeds from this offering and the concurrent private placement of common stock to an affiliate of Celgene and could spend the proceeds in ways that do not improve our results of operations or enhance the value of our common stock. The failure by our management to apply these funds effectively could result in financial losses, and these financial losses could have a material adverse effect on our business, cause the price of our common stock to decline and delay the development of our product candidates. Pending their use, we may invest the net proceeds from this offering and the concurrent private placement in a manner that does not produce income or that loses value.

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

We are an “emerging growth company,” as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. We will remain an emerging growth company until the earlier of (i) the last day of the fiscal year in which we have total annual gross revenues of $1 billion or more; (ii) the last day of the fiscal year following the fifth anniversary of the date of the completion of this offering; (iii) the date on which we have issued more than

$1 billion in nonconvertible debt during the previous three years; or (iv) the date on which we are deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission, which means the market value of our common stock that is held by non-affiliates exceeds $700 million as of the prior June 30th. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements;
- providing only two years of audited financial statements in addition to any required unaudited interim financial statements and a correspondingly reduced "Management's discussion and analysis of financial condition and results of operations" disclosure;
- reduced disclosure obligations regarding executive compensation; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved. In this prospectus, we have not included all of the executive compensation-related information that would be required if we were not an emerging growth company.

We may choose to take advantage of some, but not all, of the available exemptions. We have taken advantage of reduced reporting burdens in this prospectus. In particular, we have provided only two years of audited financial statements and have not included all of the executive compensation information that would be required if we were not an emerging growth company. We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

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

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

As a public company, and particularly after we are no longer an "emerging growth company," we will incur significant legal, accounting and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act of 2002 and rules subsequently implemented by the Securities and Exchange Commission and NASDAQ have imposed various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel will need to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. For example, we expect that these rules and regulations may make it more difficult and more expensive for us to obtain director and officer liability insurance. Overall, we estimate that our incremental costs resulting from operating as a public company may be between $2 million and $4 million per year.

Pursuant to Section 404 of the Sarbanes-Oxley Act of 2002, or Section 404, we will be required to furnish a report by our management on our internal control over financial reporting, including an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. However, while we remain an emerging growth company, we will not be required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. To achieve

compliance with Section 404 within the prescribed period, we will be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. In this regard, we will need to continue to dedicate internal resources, potentially engage outside consultants and adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to improve control processes as appropriate, validate through testing that controls are functioning as documented and implement a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that neither we nor our independent registered public accounting firm will be able to conclude within the prescribed timeframe that our internal control over financial reporting is effective as required by Section 404. This could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements.

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

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

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

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 holders of a large number of shares intend to sell shares, could reduce the market price of our common stock. After this offering and the concurrent private placement of common stock to an affiliate of Celgene, we will have outstanding 30,127,620 shares of common stock based on the number of shares outstanding as of May 31, 2013. This includes the shares that we are selling in this offering, which may be resold in the public market immediately without restriction, unless purchased by our affiliates. The remaining 24,238,732 shares are currently restricted as a result of securities laws or lock-up agreements but will be able to be sold after the offering as described in the "Shares eligible for future sale" section of this prospectus. Moreover, after this offering and the concurrent private placement, holders of an aggregate of approximately 20,439,897 shares of our common stock will have rights, subject to some conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders. We also intend to register all shares of common stock that we may issue under our equity compensation plans. Once we register these shares, they can be freely sold in the public market upon issuance, subject to volume limitations applicable to affiliates and the lock-up agreements described in the "Underwriting" section of this prospectus.

Cautionary note regarding forward-looking statements

This prospectus contains forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, contained in this prospectus, including statements regarding our strategy, future operations, future financial position, future revenue, projected costs, prospects, plans, objectives of management and expected market growth are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements.

The words "anticipate," "believe," "estimate," "expect," "intend," "may," "plan," "predict," "project," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. These forward-looking statements include, among other things, statements about:

- the initiation, timing, progress and results of future preclinical studies and clinical trials, and our research and development programs;
- our plans to develop and commercialize our product candidates;
- the timing or likelihood of regulatory filings and approvals;
- the implementation of our business model, strategic plans for our business, product candidates and technology;
- our commercialization, marketing and manufacturing capabilities and strategy;
- the rate and degree of market acceptance and clinical utility of our medicines;
- our competitive position;
- our intellectual property position;
- developments and projections relating to our competitors and our industry;
- our ability to maintain and establish collaborations or obtain additional funding;
- our expectations regarding the time during which we will be an emerging growth company under the JOBS Act;
- our expectations related to the use of proceeds from this offering and the concurrent private placement of common stock to an affiliate of Celgene; and
- our estimates regarding expenses, future revenue, capital requirements and needs for additional financing.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included in this prospectus, particularly in the "Risk factors" section, that could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments that we may make.

You should read this prospectus, the documents that we reference in this prospectus and the documents that we have filed as exhibits to the registration statement of which this prospectus is a part completely and with the understanding that our actual future results may be materially different from what we expect. We do not assume any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

Use of proceeds

We estimate that the net proceeds from our issuance and sale of 5,888,888 shares of our common stock in this offering will be approximately $ 96.3 million, based on the initial public offering price of $ 18.00 per share, and after deducting the underwriting discounts and commissions and estimated offering expenses payable by us. If the underwriters exercise their over-allotment option in full, we estimate that our net proceeds will be approximately $111.1 million. We will also receive $12.75 million from the sale of 708,333 shares of common stock in the concurrent private placement to an affiliate of Celgene at the public offering price of $18.00 per share.

As of March 31, 2013, we had cash, cash equivalents and marketable securities of $115.8 million. We intend to use the net proceeds from this offering and the concurrent private placement, together with our existing cash resources, as follows:

- approximately $5 million to fund the costs of phase 1 clinical development of AG-221;
- if we exercise our option to develop and commercialize AG-120 in the United States, approximately $20-25 million to fund IND-enabling costs and our share of early development costs for AG-120;
- approximately $20 million to fund the IND-enabling activities and phase 1/2 clinical development of AG-348;
- approximately $20-25 million to fund research and development to advance our pipeline of earlier-stage cancer metabolism and IEM programs; and
- the remainder for working capital and other general corporate purposes.

This expected use of net proceeds from this offering and the concurrent private placement of common stock represents our intentions based upon our current plans and business conditions, which could change in the future as our plans and business conditions evolve. The amounts and timing of our actual expenditures may vary significantly depending on numerous factors, including the progress of our development, the status of and results from clinical trials, as well as any additional collaborations that we may enter into with third parties for our product candidates, and any unforeseen cash needs. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering and the concurrent private placement.

We believe opportunities may exist from time to time to expand our current business through acquisitions or in-licenses of complementary companies, medicines or technologies. While we have no current agreements, commitments or understandings for any specific acquisitions or in-licenses at this time, we may use a portion of the net proceeds for these purposes.

Pending use of the proceeds as described above, we intend to invest the proceeds in a variety of capital preservation investments, including short-term, interest-bearing, investment-grade instruments and U.S. government securities.

Dividend policy

We have not declared or paid any cash dividends on our capital stock since our inception. We intend to retain future earnings, if any, to finance the operation and expansion of our business and do not anticipate paying any cash dividends to holders of common stock in the foreseeable future.

Industry and other data

We obtained the industry, market and competitive position data in this prospectus from our own internal estimates and research as well as from industry and general publications and research, surveys and studies conducted by third parties. Industry publications, studies and surveys generally state that they have been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. While we believe that each of these studies and publications is reliable, we have not independently verified market and industry data from third-party sources. While we believe our internal company research is reliable and that our internal estimates are reasonable, neither such research nor these definitions have been verified by any independent source.

Capitalization

The following table sets forth our cash, cash equivalents and marketable securities and capitalization as of March 31, 2013, as follows:

- on an actual basis;
- on a pro forma basis to reflect (i) the automatic conversion of all outstanding shares of our preferred stock into 19,731,564 shares of common stock upon the closing of this offering and (ii) the filing of our restated certificate of incorporation as of the closing date of this offering; and
- on a pro forma as adjusted basis to give further effect to (i) our issuance and sale of 5,888,888 shares of common stock in this offering at the initial public offering price of $18.00 per share, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us, and (ii) our issuance and sale of 708,333 shares of common stock in the concurrent private placement to an affiliate of Celgene at the public offering price of $18.00 per share.

Our capitalization following the closing of this offering will be adjusted based on the actual initial public offering price and other terms of the offering determined at pricing. You should read this information in conjunction with our consolidated financial statements and the related notes appearing at the end of this prospectus and the "Management's discussion and analysis of financial condition and results of operations" section and other financial information contained in this prospectus.

	As of March 31, 2013		
(in thousands, except share and per share data)	Actual	Pro forma	Pro forma as adjusted(1)
Cash, cash equivalents and marketable securities	$115,751	$115,751	$224,781
Series A convertible preferred stock, par value $0.001 per share; 33,188,889 shares authorized, 33,188,889 shares issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted	$ 32,940	$ —	$ —
Series B convertible preferred stock, par value $0.001 per share; 5,190,551 shares authorized, 5,190,551 shares issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted	5,681	—	—
Series C-1 convertible preferred stock, par value $0.001 per share; 7,395,829 shares authorized, 7,395,829 shares issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted	36,133	—	—
Series C-2 convertible preferred stock, par value $0.001 per share; 8,486,560 shares authorized, 8,486,560 shares issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted	41,168	—	—
Preferred stock, par value $0.001 per share; no shares authorized, issued or outstanding, actual; 25,000,000 shares authorized and no shares issued or outstanding, pro forma and pro forma as adjusted	—	—	—
Common stock, par value $0.001 per share; 78,300,000 shares authorized, 3,681,670 shares issued and outstanding, actual; 125,000,000 shares authorized, pro forma and pro forma as adjusted; 23,413,234 shares issued and outstanding, pro forma; 30,010,455 shares issued and outstanding, pro forma as adjusted	3	23	30
Additional paid-in capital	2,461	118,363	227,386
Accumulated other comprehensive loss	(1)	(1)	(1)
Accumulated deficit	(81,265)	(81,265)	(81,265)
Total stockholders' (deficit) equity	(78,802)	37,120	146,150
Total capitalization	$ 37,120	$ 37,120	$146,150

(1) The closing of this offering is not contingent upon the closing of the concurrent private placement with an affiliate of Celgene.

The table above does not include:

- 3,089,917 shares of common stock issuable upon exercise of stock options outstanding as of March 31, 2013, at a weighted-average exercise price of $0.86 per share;
- 724,181 shares of common stock reserved as of March 31, 2013, for future issuance under our 2007 stock incentive plan; and
- 1,236,362 additional shares of our common stock that will be available for future issuance, as of the closing of this offering, under our 2013 stock incentive plan and our 2013 employee stock purchase plan.

Dilution

If you invest in our common stock in this offering, your ownership interest will be immediately diluted to the extent of the difference between the initial public offering price per share and the pro forma as adjusted net tangible book value per share of our common stock after this offering.

Our historical net tangible book value as of March 31, 2013 was approximately $37.1 million, or $10.08 per share of common stock. Our historical net tangible book value is the amount of our total tangible assets less our total liabilities. Net historical tangible book value per share is our historical net tangible book value divided by the number of shares of common stock outstanding as of March 31, 2013.

Our pro forma net tangible book value as of March 31, 2013 was $49.9 million, or $2.07 per share of common stock. Pro forma net tangible book value gives effect to (i) the conversion of all of our outstanding convertible preferred stock into an aggregate of 19,731,564 shares of our common stock which will occur automatically upon the completion of this offering, and (ii) the sale by us in the private placement to an affiliate of Celgene of $12.75 million of our common stock concurrently with the completion of this offering at the public offering price of $18.00 per share.

Pro forma as adjusted net book value is our pro forma net tangible book value, plus the effect of the sale of shares of our common stock in this offering, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us. This amount represents an immediate increase in pro forma as adjusted net tangible book value of $2.80 per share to our existing stockholders, and an immediate dilution of $13.13 per share to investors participating in this offering.

The following table illustrates this dilution on a per share basis:

Initial public offering price per share		$18.00
Historical net tangible book value per share as of March 31, 2013	$10.08	
Pro forma decrease in net tangible book value per share as of March 31, 2013 attributable to the conversion of convertible preferred stock and concurrent private placement described in previous paragraph	(8.01)	
Pro forma net tangible book value per share as of March 31, 2013, before giving effect to this offering	2.07	
Increase in pro forma net tangible book value per share attributable to investors participating in this offering	2.80	
Pro forma as adjusted net tangible book value per share after this offering		4.87
Dilution per share to investors participating in this offering		$13.13

The following table summarizes, on a pro forma basis as of March 31, 2013, the total number of shares purchased from us, the total consideration paid, or to be paid, and the average price per share paid, or to be paid, by existing stockholders (including the shares of common stock purchased by an affiliate of Celgene in the private placement) and by new investors in this offering at the initial public offering price of $18.00 per share, before deducting underwriting discounts and commissions and estimated offering expenses payable by us. As the table below shows, investors purchasing shares in this offering will pay an average price per share substantially higher than our existing stockholders paid.

	Shares purchased		Total consideration		Average price per share
	Number	Percent	Amount	Percent	
Existing stockholders	24,121,567	80%	$ 133,204,408	56%	$ 5.52
Investors participating in this offering	5,888,888	20	105,999,984	44	18.00
Total	30,010,455	100%	$ 239,204,392	100%	

Except as otherwise indicated, the discussion and tables above assume no exercise of the underwriters' option to purchase additional shares of our common stock in this offering and no exercise of any outstanding options. If the underwriters' option to purchase additional shares is exercised in full:

- the percentage of outstanding common stock held by existing stockholders will be reduced to 78% of the total number of shares of common stock to be outstanding upon completion of this offering; and
- the number of shares of common stock held by investors participating in this offering will be increased to 6,772,221 shares, or 22% of the total number of shares of common stock to be outstanding upon completion of this offering.

The foregoing discussion and tables are based on the number of shares of common stock outstanding as of March 31, 2013, and excludes:

- 3,089,917 shares of common stock issuable upon exercise of stock options outstanding as of March 31, 2013, at a weighted-average exercise price of $0.86 per share;
- 724,181 shares of common stock reserved as of March 31, 2013 for future issuance under our 2007 stock incentive plan; and
- 1,236,362 additional shares of our common stock that will be available for future issuance, as of the closing of this offering, under our 2013 stock incentive plan and our 2013 employee stock purchase plan.

To the extent any of these outstanding options is exercised, there will be further dilution to investors participating in this offering. To the extent all of such outstanding options had been exercised as of March 31, 2013, the pro forma as adjusted net tangible book value per share after this offering would be $4.50, and total dilution per share to investors participating in this offering would be $13.50.

Effective immediately upon closing of this offering, an aggregate of 1,348,105 shares of our common stock will be reserved for issuance under our stock-based compensation plans, and these share reserves will also be subject to automatic annual increases in accordance with the terms of the plans. Furthermore, we may choose to raise additional capital through the sale of equity or convertible debt securities due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that any of these options are exercised, new options are issued under our equity incentive plans or we issue additional shares of common stock or other equity or convertible debt securities in the future, there will be further dilution to investors participating in this offering.

Selected consolidated financial data

You should read the following selected consolidated financial data in conjunction with "Management's discussion and analysis of financial condition and results of operations" and our consolidated financial statements and the related notes appearing elsewhere in this prospectus.

The consolidated statements of operations data for the years ended December 31, 2011 and 2012 and the consolidated balance sheet data at December 31, 2011 and 2012, are derived from our audited consolidated financial statements appearing elsewhere in this prospectus. The consolidated statements of operations data for the three months ended March 31, 2012 and 2013 and the consolidated balance sheet data at March 31, 2013 are derived from our unaudited consolidated financial statements included in this prospectus. The unaudited consolidated financial statements include, in the opinion of management, all adjustments that management considers necessary for the fair presentation of the financial information set forth in those statements. Our historical results are not necessarily indicative of the results to be expected in any future period.

	Years ended December 31,		Three months ended March 31,	
(in thousands, except share and per share data)	2011	2012	2012	2013
Consolidated statement of operations data:				
Revenue	$ 21,837	$ 25,106	$ 6,268	$ 6,268
Operating expenses:				
Research and development	31,253	41,037	9,551	11,462
General and administrative	7,215	7,064	1,981	1,852
Total operating costs	38,468	48,101	11,532	13,314
Loss from operations	(16,631)	(22,995)	(5,264)	(7,046)
Investment income	132	69	26	8
Loss before provision (benefit) for income taxes	(16,499)	(22,926)	(5,238)	(7,038)
Provision (benefit) for income taxes	7,207	(2,824)	(607)	190
Net loss	(23,706)	(20,102)	(4,631)	(7,228)
Cumulative preferred stock dividends	(3,100)	(7,190)	(1,798)	(1,798)
Net loss applicable to common stockholders	$ (26,806)	$ (27,292)	$ (6,429)	$ (9,026)
Net loss per share applicable to common shareholders—basic and diluted	$ (8.90)	$ (8.02)	$ (1.98)	$ (2.47)
Weighted-average number of common shares used in net loss per share applicable to common stockholders—basic and diluted	3,013,366	3,401,719	3,246,844	3,658,016
Pro forma net loss per share applicable to common shareholders—basic and diluted(1)		$ (1.18)		$ (0.39)
Weighted-average number of common shares used in pro forma net loss per share applicable to common stockholders—basic and diluted		23,133,283		23,389,580

(1) Pro forma net loss per share applicable to common shareholders gives effect to the automatic conversion of all outstanding shares of our preferred stock into an aggregate of 19,731,564 shares of common stock upon the closing of this offering.

(in thousands)	As of December 31, 2011 Actual	As of December 31, 2012 Actual	As of March 31, 2013 Actual	As of March 31, 2013 Pro forma(1)	As of March 31, 2013 Pro forma as adjusted(2)
Consolidated balance sheet data:					
Cash, cash equivalents and marketable securities	$179,168	$127,976	$115,751	$115,751	$224,781
Total assets	$ 194,470	$ 137,008	$125,853	$125,853	$ 234,883
Total liabilities	$ 131,330	$ 93,110	$ 88,733	$ 88,733	$ 88,733
Convertible preferred stock	$115,922	$115,922	$115,922	$ —	$ —
Common stock	$ 3	$ 3	$ 3	$ 23	$ 30
Additional paid-in capital	$ 1,127	$ 2,012	$ 2,461	$ 118,363	$227,386
Accumulated deficit	$ (53,935)	$ (74,037)	$ (81,265)	$ (81,265)	$ (81,265)
Total stockholders' (deficit) equity	$ (52,782)	$ (72,024)	$ (78,802)	$ 37,120	$146,150

(1) The pro forma balance sheet data give effect to the conversion of all outstanding shares of our convertible preferred stock into an aggregate of 19,731,564 shares of common stock upon the closing of this offering.

(2) The pro forma as adjusted balance sheet data gives effect to (i) our issuance and sale of 5,888,888 shares of common stock at the initial public offering price of $18.00 per share, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us and (ii) our issuance and sale of 708,333 shares of common stock in the concurrent private placement to an affiliate of Celgene at the public offering price of $18.00 per share.

Management's discussion and analysis of financial condition and results of operations

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

Overview

We are a biopharmaceutical company passionately committed to applying our scientific leadership in the field of cellular metabolism to transform the lives of patients with cancer and inborn errors of metabolism, or IEMs, which are a subset of orphan genetic metabolic diseases. Metabolism is a complex biological process involving the uptake and assimilation of nutrients in cells to produce energy and facilitate many of the processes required for cellular division and growth. We believe that dysregulation of normal cellular metabolism plays a crucial role in many diseases, including certain cancers and IEMs. We singularly focus our efforts on using cellular metabolism, an unexploited area of biological research with disruptive potential, as a platform for developing potentially transformative small molecule medicines for cancer and IEMs. The lead product candidates in our most advanced programs are aimed at druggable targets which have undergone rigorous validation processes. Our most advanced cancer product candidates, AG-221 and AG-120, which target mutant IDH2 and IDH1, respectively, have demonstrated strong proof of concept in preclinical models and are expected to enter the clinic in mid-2013 and early 2014, respectively. The lead candidate in our IEM program, AG-348, targets pyruvate kinase and is expected to commence clinical development in 2014. We filed an investigational new drug application, or IND, for AG-221 with the FDA on June 20, 2013. To date, we have not filed any other INDs and we have not commenced clinical trials for any of our product candidates.

Our initial therapeutic area of focus is cancer. We are leveraging our expertise in metabolic pathways to discover, validate, develop and commercialize a pipeline of novel drug candidates. In April 2010, we entered into a collaboration agreement with Celgene focused on cancer metabolism. Under the collaboration, we are leading discovery, preclinical and early clinical development for all cancer metabolism programs. The discovery phase of the collaboration expires in April 2014, subject to Celgene's option to extend the discovery phase for up to two additional years. Celgene has the option to obtain exclusive rights for the further development and commercialization of certain of these programs, and we will retain rights to the others. For the programs that Celgene chooses to license, we may elect to participate in a portion of sales activities for the medicines from such programs in the United States. For certain of these programs, we may elect to retain full rights to develop and commercialize medicines from these programs in the United States. Through March 31, 2013, we have received approximately $141.2 million in payments from Celgene and $37.5 million in equity investments. We are also eligible to receive extension payments, payments upon the successful achievement of specified milestones, reimbursements for certain development expenses and royalties on any product sales.

Since inception, our operations have focused on organizing and staffing our company, business planning, raising capital, assembling our core capabilities in cellular metabolism, identifying potential product candidates, undertaking preclinical studies and, anticipated to begin in mid-2013, conducting a clinical trial. To date, we have financed our operations primarily through funding received from our collaboration agreement with Celgene and private placements of our preferred stock. Substantially all of our revenue to date has been collaboration revenue. Since our inception, and through March 31, 2013, we have raised an aggregate of approximately $261.2 million to fund our operations, of which approximately $141.2 million was through upfront and extension payments related to our collaboration agreement with Celgene, and approximately $120.0 million was from the issuance of preferred stock.

Since inception, we have incurred significant operating losses. Our net losses were $7.2 million, $20.1 million and $23.7 million for the three months ended March 31, 2013 and for the years ended December 31, 2012 and 2011, respectively. As of March 31, 2013, we had an accumulated deficit of $81.3 million. We expect to continue to incur significant expenses and operating losses over the next several years. Our net losses may fluctuate significantly from quarter to quarter and from year to year. We anticipate that our expenses will increase significantly as we commence the planned IND-enabling and clinical development activities for our lead programs AG-221, AG-120, and AG-348; continue to discover, validate and drug additional novel product candidates; expand and protect our intellectual property portfolio; and hire additional development and scientific personnel. In addition, upon the closing of this offering we expect to incur additional costs associated with operating as a public company.

Financial operations overview

Revenue

To date, we have not generated any revenue from product sales and do not expect to generate any revenue from the sale of products in the near future. All of our revenue to date has been derived from our collaboration with Celgene and funding from research grant agreements. Under our Celgene collaboration we are recognizing revenue related to the upfront license fee of $121.2 million, the implied premium of $3.1 million paid on the purchase of $8.8 million of series B convertible preferred stock and the $20.0 million extension payment received in October 2011 to extend the discovery phase until April 2014, ratably over the period over which we expect to fulfill our performance obligations, which we refer to as the performance period. As of March 31, 2013, we have not received any milestone or royalty payments under the Celgene collaboration. We expect that any revenue we generate from our collaboration agreement will fluctuate from quarter to quarter as a result of the uncertain timing and amount of milestone payments, royalties and other payments.

In the future, we will seek to generate revenue from a combination of product sales and extension payments, milestone payments, and royalties on future product sales in connection with Celgene, or other strategic relationships.

Research and development expenses

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

- employee-related expenses including salaries, benefits, and stock-based compensation expense;
- expenses incurred under agreements with third parties, including contract research organizations, or CROs, that conduct research and development and preclinical activities on our behalf and the cost of consultants;
- the cost of lab supplies and acquiring, developing, and manufacturing preclinical study materials; and
- facilities, depreciation, and other expenses, which include direct and allocated expenses for rent and maintenance of facilities, insurance, and other operating costs.

Research and development costs are expensed as incurred. Nonrefundable advance payments for goods or services to be received in the future for use in research and development activities are deferred and capitalized. The capitalized amounts are expensed as the related goods are delivered or the services are performed.

The following summarizes our most advanced current research and development programs.

AG-221: lead IDH2 program

AG-221 is an orally available, selective, potent inhibitor of the mutated IDH2 protein, making it a highly targeted therapeutic candidate for the treatment of patients with cancers that harbor IDH2 mutations. In September 2012,

AG-221 successfully completed the development candidate requirements pursuant to our Celgene collaboration. We believe AG-221 has demonstrated a clear safety profile to advance into clinical trials and, on June 20, 2013, we filed an IND to commence such trials. We expect to enter the clinic in mid-2013. Celgene has the exclusive option to license worldwide development and commercial rights to AG-221 and if Celgene elects this option it would be responsible for all future development and commercialization costs.

AG-120: lead IDH1 program

AG-120 is an orally available, selective, potent inhibitor of the mutated IDH1 protein, making it a highly targeted therapeutic candidate for the treatment of patients with cancers that harbor IDH1 mutations. In March 2013, AG-120 successfully completed the development candidate requirements pursuant to our Celgene collaboration and has initiated IND-enabling studies. We expect to enter the clinic in early 2014. Celgene has the exclusive option to license development and commercialization rights to AG-120, in which case, we have the option to retain U.S. development and commercialization rights. If Celgene exercises such option and we elect to retain U.S. rights, we and Celgene will equally fund the global development costs of AG-120 that are not specific to any particular region or country, Celgene will be responsible for development and commercialization costs specific to countries outside the United States, and we will be responsible for development and commercialization costs specific to the United States.

AG-348: pyruvate kinase deficiency program

Our lead IEM program relates to certain genetic defects of the pyruvate kinase enzyme causing a form of hemolytic anemia known as pyruvate kinase deficiency, or PK deficiency. AG-348 is an orally available, potent small molecule activator of the PKR enzyme, an isoform of PK that when mutated leads to PK deficiency, making AG-348 a highly targeted therapeutic candidate for the treatment of patients with PK deficiency. In May 2013, AG-348 successfully completed our internal development candidate requirements, which include two species of exploratory safety studies, and has initiated IND-enabling studies. We expect to enter the clinic in 2014. We have retained worldwide development and commercial rights to AG-348 and expect to fund the future development and commercialization costs related to this program.

Other research and platform programs

Other research and platform programs include activities related to exploratory efforts, target validation, lead optimization for our earlier validated programs and our proprietary metabolomics platform.

We began tracking our internal and external research and development costs on a program-by-program basis in 2011. As such, we do not have historical research and development expenditures by program prior to January 1, 2011. We use our employee and infrastructure resources across multiple research and development programs, and we allocate internal employee-related and infrastructure costs, as well as certain third party costs, to each of these programs based on the personnel resources allocated to such program. Our research and development expenses, by major program, are outlined in the table below:

	Years ended, December 31,		Three months ended, March 31,	
(in thousands)	2011	2012	2012	2013
IDH2 (AG-221)	$ 4,674	$ 9,418	$ 2,330	$ 2,486
IDH1 (AG-120)	9,045	10,785	2,926	2,734
PK deficiency (AG-348)	3,995	5,005	1,176	1,200
Other research and platform programs	13,539	15,829	3,119	5,042
Total research and development expenses	$31,253	$ 41,037	$9,551	$11,462

The successful development of our product candidates is highly uncertain. As such, at this time, we cannot reasonably estimate or know the nature, timing and estimated costs of the efforts that will be necessary to

complete the remainder of the development of these product candidates. We are also unable to predict when, if ever, material net cash inflows will commence from AG-221, AG-120, or AG-348. This is due to the numerous risks and uncertainties associated with developing medicines, including the uncertainty of:

- establishing an appropriate safety profile with IND-enabling toxicology studies;
- successful enrollment in, and completion of clinical trials;
- receipt of marketing approvals from applicable regulatory authorities;
- establishing commercial manufacturing capabilities or making arrangements with third-party manufacturers;
- obtaining and maintaining patent and trade secret protection and regulatory exclusivity for our product candidates;
- launching commercial sales of the products, if and when approved, whether alone or in collaboration with others; and
- a continued acceptable safety profile of the products following approval.

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

Research and development activities are central to our business model. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials. We expect research and development costs to increase significantly for the foreseeable future as our product candidate development programs progress. However, we do not believe that it is possible at this time to accurately project total program-specific expenses through commercialization. There are numerous factors associated with the successful commercialization of any of our product candidates, including future trial design and various regulatory requirements, many of which cannot be determined with accuracy at this time based on our stage of development. Additionally, future commercial and regulatory factors beyond our control will impact our clinical development programs and plans.

General and administrative expenses

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

We anticipate that our general and administrative expenses will increase in the future to support continued research and development activities, potential commercialization of our product candidates and increased costs of operating as a public company. These increases will likely include increased costs related to the hiring of additional personnel and fees to outside consultants, lawyers and accountants, among other expenses. Additionally, we anticipate increased costs associated with being a public company including expenses related to services associated with maintaining compliance with exchange listing and Securities and Exchange Commission requirements, insurance, and investor relations costs.

Critical accounting policies and estimates

Our discussion and analysis of our financial condition and results of operations are based on our consolidated financial statements, which we have prepared in accordance with United States generally accepted accounting principles. The preparation of these consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and

liabilities at the date of the financial statements, as well as the reported amounts of revenues and expenses during the reporting periods. On an ongoing basis, we evaluate our estimates and judgments, including those described in greater detail below. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in more detail in the notes to our consolidated financial statements included elsewhere in this prospectus, we believe that the following accounting policies are the most critical to aid you in fully understanding and evaluating our financial condition and results of operations.

Revenue recognition

To date, our revenues have been generated primarily from our collaboration agreement with Celgene.

For multiple-element arrangements entered into prior to January 1, 2011 and not materially modified thereafter, including the Celgene agreement, we recognize revenue in accordance with Accounting Standards Codification, or ASC, 605, *Revenue Recognition*. When evaluating multiple element arrangements, we consider whether the deliverables in the arrangement should be accounted for as separate units of accounting. In making this determination we evaluate whether (1) the elements have stand-alone value, and (2) if we are able to estimate the fair value of all undelivered elements under the arrangement. Revenue is then recognized for each unit of accounting when all of the following criteria are met:

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

We concluded that there is one unit of accounting for the Celgene agreement and we are recording revenue over the period over which we expect to fulfill our performance obligations under our agreement, which we refer to as the performance period. We estimate the performance period based upon the length of the discovery phase of our agreements, and our expectations regarding the collaborator's ability and intent of exercising its option to extend the research term, as applicable, pursuant to the provisions of the respective agreement. Our estimates of our performance period may change over the course of the research term. Such a change could have a material impact on the amount of revenue we record in future periods. Amounts received prior to satisfying the above revenue recognition criteria are recorded as deferred revenue on our consolidated balance sheets.

In January 2011, we adopted the Financial Accounting Standards Board's (FASB) Accounting Standards Update (ASU) No. 2009-13, *Multiple-Element Revenue Arrangements*, on a prospective basis, which we will apply to all revenue arrangements entered into or materially modified after the adoption date. When evaluating multiple element arrangements pursuant to ASU 2009-13, we consider whether the deliverables in the arrangement represent separate units of accounting. This evaluation 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. In determining the units of accounting, management evaluates certain criteria, including:

- Whether the delivered item or items have value to the customer on a standalone basis, and
- If the arrangement includes a general right of return relative to the delivered item or items, delivery or performance of the undelivered item or items is considered probable and substantially in the control of the vendor.

The arrangement consideration is then allocated to each separately identified unit of accounting based on the relative selling price of each deliverable, and the applicable revenue recognition criteria, as described above, are applied to each of the units of accounting. In the event that an element of a multiple element arrangement does not represent a separate unit of accounting, we recognize revenue from the combined element over the period over which we expect to fulfill our performance obligations or as undelivered items are delivered, as appropriate.

On January 1, 2011, we adopted ASU 2010-17, *Revenue Recognition-Milestone Method*, on a prospective basis. At the inception of each agreement that includes milestone payments, we evaluate whether each milestone is substantive and at risk to both parties on the basis of the contingent nature of the milestone. This evaluation includes an assessment of whether (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 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. We evaluate factors such as the degree of certainty in achieving the milestone, the research and development risk and other risks that must be overcome to achieve the milestone, as well as the level of effort and investment required and whether the milestone consideration is reasonable relative to all deliverables and payment terms in the arrangement. The conclusion as to whether milestone payments are substantive involves management judgment regarding the factors noted above.

We classify each of our milestones into one of three categories: (i) clinical development milestones, (ii) regulatory milestones, and (iii) commercial milestones. Clinical development milestones are typically achieved when a product candidate advances into a defined phase of clinical research or completes such phase. For example, a milestone payment may be due to us upon the initiation of a phase 3 clinical trial, which is the last phase of clinical development and could eventually contribute to marketing approval by the FDA or other regulatory authorities. Regulatory milestones are typically achieved upon acceptance of the submission for marketing approval of a product candidate or upon approval to market the product candidate by the FDA or other regulatory authorities. For example, a milestone payment may be due to us upon the FDA's acceptance of an NDA. Commercial milestones are typically achieved when an approved pharmaceutical product reaches certain defined levels of net sales by the licensee, such as when a product first achieves global sales or annual sales of a specified amount.

We have not earned any milestone payments pursuant to the Celgene agreement to date. We have concluded that certain of the clinical development and regulatory milestones that may be received under the Celgene Agreement are substantive. Revenues from milestones, if they are nonrefundable and deemed substantive, are recognized upon successful accomplishment of the milestones. To the extent that non-substantive milestones are achieved and we have remaining performance obligations, milestones are deferred and recognized as revenue over the estimated remaining period of performance. We will recognize revenue associated with the non-substantive milestones upon achievement of the milestone if there are no undelivered elements and we have no remaining performance obligations. We will account for sales-based milestones as royalties, with revenue recognized upon achievement of the milestone.

Income taxes

We account for uncertain tax positions in accordance with the provisions of Topic ASC 740, *Accounting for Income Taxes.* When uncertain tax positions exist, we recognize 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 March 31, 2013, we do not have any significant uncertain tax positions.

Income taxes are recorded in accordance with ASC 740, *Accounting for Income Taxes*, which provides for deferred taxes using an asset and liability approach. We recognize deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. We determine our deferred tax assets and liabilities based on differences between financial reporting and tax bases of

assets and liabilities, which are measured using the enacted tax rates and laws that will be in effect when 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.

As required by ASC 740, *Income Taxes*, our management has evaluated the positive and negative evidence bearing upon the realizability of our deferred tax assets, which are comprised principally of timing differences related to the recognition of revenue under our collaboration agreement with Celgene for book versus tax purposes. During the year ended December 31, 2011, our management determined that it was more likely than not that we would realize a portion of our deferred tax assets because of our ability to carryback future losses for U.S. federal income tax purposes. As a result, we reversed approximately $10.7 million of our valuation allowance in the year ended December 31, 2011, representing the amount of deferred tax assets that will be realized in 2012 and 2013, the years available for carryback. We utilized certain of our deferred tax assets, including net operating losses, or NOLs, generated in the year ended December 31, 2012 to reduce our 2011 U.S. federal income tax liability. For the remainder of our deferred tax assets, our management has determined that it is more likely than not that we may not realize the benefit and we have recorded a valuation allowance of approximately $31.8 million at December 31, 2012.

During the years ended December 31, 2011 and 2012 and the three months ended March 31, 2012 and 2013, we had $284,000, $583,000, $38,000 and $190,000 accrued for interest and penalties related to the non-payment of U.S. federal income taxes, respectively, that are recorded in the provision (benefit) for income taxes in the statements of operations.

As of December 31, 2012, we had net operating loss carryforwards to reduce federal and state incomes taxes of approximately $0.5 million and $28.8 million, respectively. If not utilized, these carryforwards expire at various dates through 2032. At December 31, 2012, we also had available research and development tax credits for federal and state income tax purposes of approximately $27,000 and $616,000, respectively. During 2011, we conducted a study of our research and development credit carryforwards. The study resulted in an adjustment to our research and development credit carryforward, as we do not believe that these credits are more likely than not to be realized. Additionally, utilization of the NOL carryforwards and credits may be subject to annual limitations as prescribed by federal and state statutory provisions. The annual limitation may result in the expiration of NOL carryforwards prior to their utilization.

Utilization of the NOLs and tax credit carryforwards may be subject to a substantial annual limitation due to ownership change limitations that have occurred previously or that could occur in the future, as provided by Section 382 of the Internal Revenue Code of 1986 (Section 382), as well as similar state provisions. Ownership changes may limit the amount of NOLs and tax credit carryforwards that can be utilized annually to offset future taxable income and tax, respectively. In general, an ownership change, as defined by Section 382, results from transactions that increase the ownership of 5% shareholders in the stock of a corporation by more than 50 percent in the aggregate over a three-year period. During 2011, we completed a study through December 31, 2011, to determine whether any ownership change has occurred since our formation and have determined that transactions have resulted in two ownership changes, as defined by Section 382. The impact of the ownership changes was reflected in our deferred tax assets in the year ended December 31, 2011. There could be additional ownership changes in the future that could further limit the amount of NOLs and tax credit carryforwards that we can utilize.

Accrued research and development expenses

As part of the process of preparing our consolidated financial statements, we are required to estimate our accrued expenses. This process involves reviewing quotations and contracts, identifying services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of the actual cost. The majority of our service providers invoice us monthly in arrears for services performed or when contractual milestones are met. We make estimates of our accrued expenses as of each balance sheet date in our financial statements based on facts and

circumstances known to us at that time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments if necessary. The significant estimates in our accrued research and development expenses include fees paid to CROs in connection with research and development activities for which we have not yet been invoiced.

We base our expenses related to CROs on our estimates of the services received and efforts expended pursuant to quotes and contracts with CROs that conduct research and development on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the research and development expense. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or prepaid accordingly. Although we do not expect our estimates to be materially different from amounts actually incurred, if our estimates of the status and timing of services performed differ from the actual status and timing of services performed, it could result in us reporting amounts that are too high or too low in any particular period. To date, there have been no material differences between our estimates of such expenses and the amounts actually incurred.

Stock-based compensation

We apply the fair value recognition provisions of Financial Accounting Standards Board Accounting Standards Codification Topic 718, *Compensation-Stock Compensation*, which we refer to as ASC 718, to account for stock-based compensation. We recognize stock-based compensation expense related to stock options granted to employees and directors for their services on the Board of Directors based on the estimated fair value of each stock option on the date of grant, net of estimated forfeitures, using the Black-Scholes option-pricing model. The grant date fair value of awards subject to service-based vesting, net of estimated forfeitures, is recognized on a straight-line basis over the requisite service period, which is generally the vesting period of the respective awards. In accordance with the ASC 718, stock options subject to both performance- and service-based vesting conditions are recognized using an accelerated recognition model.

We account for stock options granted to non-employees, which primarily consist of consultants and members of our scientific advisory board, using the fair value method. Stock options granted to non-employees are subject to periodic revaluation over their vesting terms and stock-based compensation expense is recognized using an accelerated recognition model.

We use the Black-Scholes option pricing model to estimate the fair value of stock option awards using various assumptions that require management to apply judgment and make estimates, including:

- the expected term of the stock option award, which we calculate using the simplified method, as prescribed by the Securities and Exchange Commission Staff Accounting Bulletin No. 107, *Share-Based Payment,* as we have insufficient historical information regarding our stock options to provide a basis for an estimate;
- the expected volatility of the underlying common stock, which we estimate based on the historical volatility of a representative group of publicly traded biopharmaceutical companies with similar characteristics to us, including development candidates in earlier stages of drug development and areas of therapeutic focus;
- the risk-free interest rate, which we based on the yield curve of U.S. Treasury securities with periods commensurate with the expected term of the options being valued;
- the expected dividend yield, which we estimate to be zero based on the fact that we have never paid cash dividends and have no present intention to pay cash dividends; and
- the fair value of our common stock on the date of grant.

If factors change and different assumptions are used, our stock-based compensation expense could be materially different in the future.

The following table summarizes the weighted-average assumptions we used in our Black-Scholes calculations for awards to employees and non-employees:

	Years ended December 31,		Three months ended March 31,
	2011	2012	2012
Risk-free interest rate	1.97%	1.09%	1.17%
Expected dividend yield	—	—	—
Expected term (in years)	6.09	6.08	6.38
Expected volatility	98.60%	97.75%	99.51%

Note: There were no stock options granted in the three months ended March 31, 2013.

In addition to the assumptions used in our Black-Scholes option-pricing model, the amount of stock option expense we recognize in our consolidated statements of operations includes an estimate of stock option forfeitures. Under ASC 718, we are required to estimate the level of forfeitures expected to occur and record compensation expense only for those awards that we ultimately expect will vest. Due to the lack of historical forfeiture activity, we expect to estimate our forfeiture rate based on data from our representative group of companies. Changes in the estimated forfeiture rate can have a significant impact on our stock-based compensation expense as the cumulative effect of adjusting the rate is recognized in the period the forfeiture estimate is changed. For example, if a revised forfeiture rate is higher than the previously estimated forfeiture rate, an adjustment is made that will result in a decrease to the stock-based compensation expense recognized in the consolidated financial statements. If a revised forfeiture rate is lower than the previously estimated forfeiture rate, an adjustment is made that will result in an increase to the stock-based compensation expense recognized in our consolidated financial statements. To date our forfeitures have not been material.

At March 31, 2013, the total unrecognized compensation expense related to unvested stock option awards, including estimated forfeitures, was $0.8 million, which we expect to recognize over a weighted-average period of approximately 1.8 years. We also have unrecognized stock-based compensation expense of $0.5 million related to stock options with performance-based vesting criteria that are not considered probable of achievement as of March 31, 2013; therefore we have not yet begun to recognize the expense on these awards.

Common stock valuation

The following table summarizes by grant date the number of shares of common stock underlying stock options granted from January 1, 2012 through April 30, 2013, as well as the associated per share exercise price, the estimated fair value per share of our common stock on the grant date and, for awards granted in September and December 2012, the retrospective fair value per share on the grant date and the related intrinsic value per common share:

Grant dates	Number of common shares underlying options granted	Estimated fair value per common share on grant date	Retrospective fair value per share on grant date	Intrinsic value per common share
February 29, 2012	104,535	$ 2.34	N/A	$ —
March 6, 2012	26,361	$ 2.34	N/A	$ —
April 6, 2012	477,202	$ 2.34	N/A	$ —
June 7, 2012	128,178	$ 2.34	N/A	$ —
September 27, 2012	30,895	$ 2.34	$ 3.14(1)	$ 0.80
December 4, 2012	65,814	$ 2.34	$ 5.78(1)	$ 3.44
April 30, 2013	613,705	$ 9.05	N/A	$ —

(1) The fair value of common stock at the grant date was adjusted in connection with a retrospective fair value assessment for financial reporting purposes, as described below.

The estimated fair value of common stock per share in the table above represents the determination by our board of directors of the fair value of our common stock as of the date of each grant, taking into consideration various objective and subjective factors, including the conclusions of both contemporaneous and retrospective valuations of our common stock, as discussed more fully below.

Determination of the fair value of common stock on grant dates

We are a private company with no active public market for our common stock. Therefore, we have periodically determined the estimated per share fair value of our common stock at various dates using contemporaneous valuations performed in accordance with the guidance outlined in the American Institute of Certified Public Accountants Practice Aid, *Valuation of Privately-Held Company Equity Securities Issued as Compensation* , also known as the Practice Aid, for financial reporting purposes.

We performed contemporaneous valuations as of November 16, 2011, October 15, 2012 and April 15, 2013. In conducting the contemporaneous valuations, we considered all objective and subjective factors that we believed to be relevant for each valuation conducted, including our best estimate of our business condition, prospects and operating performance at each valuation date. Within the contemporaneous valuations performed, a range of factors, assumptions and methodologies were used. The significant factors included:

- the lack of an active public market for our common and our preferred stock;
- the prices of shares of our preferred stock that we had sold to outside investors in arm's length transactions, and the rights, preferences and privileges of that preferred stock relative to our common stock;
- our results of operations, financial position and the status of our research and preclinical development efforts, including our IDH2 and IDH1 and PK deficiency programs;
- the material risks related to our business;
- our business strategy;
- the market performance of publicly traded companies in the life sciences and biotechnology sectors, and recently completed mergers and acquisitions of companies comparable to us;
- the likelihood of achieving a liquidity event for the holders of our common stock, such as an initial public offering or sale of the company given prevailing market conditions; and
- any recent contemporaneous valuations of our common stock prepared in accordance with methodologies outlined in the Practice Aid.

The dates of our contemporaneous valuations have not always coincided with the dates of our stock option grants. In determining the exercise prices of the stock options set forth in the table above, our board of directors considered, among other things, the most recent contemporaneous valuations of our common stock and our assessment of additional objective and subjective factors we believed were relevant as of the grant date. The additional factors considered when determining any changes in fair value between the most recent contemporaneous valuation and the grant dates included our stage of research and preclinical development, our operating and financial performance and current business conditions.

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

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

We generally used the market approach, in particular the guideline company and precedent transaction methodologies, based on inputs from comparable public companies' equity valuations and comparable acquisition transactions, to estimate the equity value of our company. Additionally, if applicable, we considered company valuations implied by arm's length transactions involving sale of our securities to independent investors, taking into consideration the various rights and preferences of the equity securities transacted.

Methods used to allocate our enterprise value to classes of securities. In accordance with the Practice Aid, we considered the various methods for allocating the enterprise value across our classes and series of capital stock to determine the fair value of our common stock at each valuation date. The methods we considered consisted of the following:

- *Option pricing method.* The option-pricing method, or OPM, treats common stock and preferred stock as call options on the enterprise's value, with exercise prices based on the liquidation preference of the preferred stock. Under this method, the common stock has value only if the funds available for distribution to shareholders exceed the value of the liquidation preference at the time of a liquidity event (for example, merger or sale), assuming the enterprise has funds available to make a liquidation preference meaningful and collectible by the shareholders
- *Probability-weighted expected return method, or PWERM.* Under a PWERM, the value of the various equity securities are estimated based upon an analysis of future values for the enterprise assuming various future outcomes. Share value is based upon the probability-weighted present value of expected future investment returns, considering each of the possible future outcomes available to the enterprise, as well as the rights of each share class.

For each of the contemporaneous valuations described below, we used either the OPM or the PWERM to determine the estimated fair value of our common stock. The method selected was based on availability and the quality of information to develop the assumptions for the methodology.

Contemporaneous valuation of common stock as of November 16, 2011

Following our series C convertible preferred stock financing in November 2011 we conducted a contemporaneous valuation of our common stock as of November 16, 2011. In conducting this valuation we estimated the value of our common stock based on the price at which we sold shares of our series C convertible preferred stock in the financing. We concluded that the price paid for the series C convertible preferred stock was representative of fair value since our series C financing included significant investment from a new unrelated lead investor. We utilized the back-solve method (a form of the market approach defined in the Practice Aid) to estimate the enterprise value at November 16, 2011 that was implied by the arm's length series C transaction. In applying the back-solve method, we utilized OPM, taking into consideration the rights and preferences of the other classes of equity as well as the stock options issued and outstanding. For the OPM analysis, we estimated the time to liquidity as 1.9 years as of November 2011 which was our best estimate for a potential exit scenario for the investors. The volatility assumption was based on an analysis of guideline companies' historical equity volatility factors for a period of approximately 1.9 years, which is the term assumption. In selecting the volatility assumption, we also took into consideration the difference in stages of development between Agios and the guideline companies. Based on this analysis of the guideline companies, a volatility assumption of 50% was selected and utilized. The risk free rate assumption was based on the yield on 2-year U.S. Treasury bonds as of November 16, 2011. The exercise prices were the breakpoints representing the liquidation preferences of the preferred stock classes, the conversion features and stock option exercise values. Based on these OPM

assumptions, an implied equity value of approximately $145.4 million was determined such that the value per-share for the series C convertible preferred stock was equal to the per-share issuance price of $13.50. Based on these assumptions, the implied value per share of the common stock on a minority, marketable basis was $2.92. Because our common stock as of November 2011 was not publicly-traded or marketable, we applied a discount for lack of marketability of 20% to the calculated value. The discount for lack of marketability was based on quantitative models (put option calculation) as well as other empirical studies of restricted stock issued by publicly-traded companies and private placements by pre-IPO companies. Based on these factors, we concluded that our common stock had a fair value of $2.34 per share as of November 16, 2011.

Stock options granted from January 2012 to September 2012

Our board of directors granted stock options on February 29, 2012, March 6, 2012, April 6, 2012, June 7, 2012, and September 27, 2012 each having an exercise price of $2.34 per share, which our board of directors determined to be the fair value of our common stock on each grant date. In addition to the objective and subjective factors discussed above, our board of directors also considered input from management and the valuation as of November 16, 2011 in estimating the fair value of our common stock. Given the lack of clarity around a future liquidity event and the lack of significant program progression in the first nine months of 2012, our board of directors determined that no significant events or other circumstances had occurred between November 16, 2011 and September 27, 2012 that would indicate there was a change in the fair value of our common stock during that period. The nomination and approval of AG-221, our first development candidate, on September 21, 2012 by Celgene was considered an important milestone for us. However, the AG-221 program still needed to complete a series of safety studies before filing an investigational new drug application, or an IND, and was approximately 9-12 months away from starting testing in human clinical trials as of September 2012.

Contemporaneous valuation of common stock as of October 15, 2012

In October 2012, we conducted a contemporaneous valuation of our common stock as of October 15, 2012. In estimating our equity value as of October 15, 2012, we again relied upon the value implied by the series C convertible preferred stock financing, along with evaluating market and company-specific factors such as the stage of our research and early preclinical programs. We considered our implied equity value of approximately $145.4 million as of November 2011 as a benchmark and assessed the performance of the market (guideline companies) between November 2011 and October 2012, as well as our research and preclinical development efforts and concluded that our equity value had not materially changed. An equity value of approximately $150.0 million was assumed, indicating an increase in equity value of less than 5%. We utilized the OPM to allocate the estimated equity value of $150.0 million among the preferred and common stock. For the OPM analysis, we estimated the time to liquidity as 1.2 years which was our best estimate for a potential exit scenario for the investors and utilized a volatility rate of 50% based on an analysis of historical equity volatility factors of guideline companies over 1-year and 1.5-year periods as of October 2012. We utilized a risk-free rate of 0.21%, which was an interpolation of yields on 1-year and 2-year U.S. Treasury bonds. This OPM analysis calculated a value for the common stock of approximately $2.75 on a minority, marketable basis. Because our common stock as of October 2012 was not publicly-traded or marketable, we applied a discount for lack of marketability of 15% to the calculated value. The discount for lack of marketability was based on quantitative models (put option calculation) as well as other empirical studies of restricted stock issued by publicly-traded companies and private placement by pre-IPO companies. Based on these factors, we concluded that our common stock had a fair value of $2.34 per share as of October 15, 2012.

Stock options granted in December 2012

Our board of directors granted stock options on December 4, 2012, having exercise prices of $2.34 per share, which our board of directors determined to be the fair value of our common stock on the grant date. The per share exercise price determined by our board of directors was supported by the October 15, 2012 valuation, as

described more fully above, along with input from management. Our board of directors believed that this was appropriate as there continued to be a lack of clarity around a future liquidity event and a lack of significant program progression since October 1, 2012 that would indicate there was a change in the fair value of our common stock.

Retrospective valuations of common stock as of June 7, 2012, September 27, 2012 and December 4, 2012

In March 2013, our board of directors, based on market conditions and the growing confidence in our lead cancer metabolism program's ability to enter clinical development in mid-2013, authorized the management team to assess the feasibility of an IPO in the second half of 2013, and in late April 2013 we selected underwriters and held an organizational meeting. In connection with the preparation of the consolidated financial statements for the year ended December 31, 2012 and in preparing for a potential IPO, we reexamined, for financial reporting purposes, the valuations of our common stock as of June 7, 2012, September 27, 2012 and December 4, 2012. In connection with that reexamination, we prepared retrospective valuation reports of the fair value of our common stock for financial reporting purposes as of June 7, 2012, September 27, 2012 and December 4, 2012. We believe that the preparation of the retrospective valuations was necessary due to the fact that the timeframe and probability for a potential IPO had accelerated significantly since the time of our initial contemporaneous valuations, and that such acceleration would have a significant impact on the fair value of our common stock. We concluded that retrospective valuations for grant dates prior to June 7, 2012 were not required due to the lack of clarity and risk related to our early stage research programs and determined it would not be reasonable to assign a probability to a future IPO.

In April 2013, we conducted retrospective valuations of our common stock as of June 7, 2012, September 27, 2012 and December 4, 2012. In reassessing the fair value of our common stock, we considered our April 2013 assessment on the feasibility of an IPO in the second half of 2013. Our assessment was primarily based on external feedback, including certain current investors, and concluded that the current market conditions may be supportive of an IPO as we initiate clinical trials with our lead programs. In addition, we considered factors and events during 2012 that contributed to our increased confidence in an IPO in the second half of 2013. We specifically reviewed the timing of the nomination of our first development candidate. AG-221, our lead compound for our IDH2 program, was approved by Celgene in September 2012. This milestone allowed us to move forward into IND-enabling studies with AG-221 and based on the outcome of these studies would allow us to begin human clinical trials in mid-2013. In addition, during the fourth quarter of 2012, in our IDH2 program we generated positive preclinical efficacy data leveraging primary AML patient samples. These *ex-vivo* experiments with primary AML patient samples were later published in *Science* in April 2013.

Our retrospective valuations utilized PWERM to estimate the fair value of our common stock at June 7, 2012, September 27, 2012 and December 4, 2012. Under this method, we estimated the value of our common stock based on the probability-weighted present value of expected future investment returns considering each of four potential future liquidity events with the emphasis on the increased probability of an IPO. The four scenarios contemplated in each retrospective valuation were an IPO scenario, high and low case sale/merger scenarios and a dissolution scenario. In order to estimate expected proceeds from each potential exit scenario, we considered the last three years of historical data from the biopharmaceutical industry for both initial public offerings and merger and acquisition transactions. When reviewing the historical data we focused on a representative group of transactions involving biopharmaceutical companies with similar characteristics to us, including development candidates in early stages of drug development and similar areas of therapeutic focus. In addition, we also considered the valuation of our last private financing in November 2011. For the dissolution scenario, we used estimated proceeds equal to what we believe would be the salvage value of assets upon liquidation. We then determined the estimated timing for each exit scenario and a probability weighting, representing the likelihood of each outcome occurring relative to the others. We calculated a present value for our common stock using assumptions such as estimated proceeds from each exit scenario, expected dates for each scenario, and an appropriate risk-adjusted discount rate. We then assigned a probability weighting to each scenario, based on our estimate of the relative likelihood of occurrence of each scenario.

Within each retrospective valuation, we applied a risk-adjusted discount rate to the equity values determined for each scenario as of the future exit dates to arrive at the present value of equity under each scenario as of each valuation date. Given our stage of development at each valuation date and that we were revisiting the valuations in the context of a potential IPO, we used a discount rate of 35%. The discount rate was based on the typical venture capital rates of return for companies in the bridge/IPO stage of development, as contemplated by the Practice Aid, which we considered to be the most appropriate given our stage of development and risk profile. Finally, we applied a discount for lack of marketability to each scenario to reflect the impact on the value of our common stock due to its lack of liquidity. The discount for lack of marketability was based on quantitative models (put option calculation) as well as other empirical studies of restricted stock issued by publicly-traded companies and private placement by pre-IPO companies.

The retrospective valuation as of June 7, 2012 using PWERM, which included the probability of an IPO of 30%, a high case sale/merger scenario of 20%, a low case sale/merger scenario of 30% and a dissolution scenario of 20%, and liquidity and discount rates that are relatively consistent with those described below for the September 27, 2012 retrospective valuation, corroborated the contemporaneous valuation determined by our board of directors that was based on an OPM. As such, we did not adjust the fair value of our common stock as of June 7, 2012 for financial reporting purposes.

The following table summarizes the significant assumptions for each of the valuation scenarios used in the PWERM analysis to determine the retrospectively reassessed fair value of our common stock as of September 27, 2012 and December 4, 2012:

Assumptions	IPO	Sale-high case	Sale-low case	Dissolution
September 27, 2012 retrospective valuation				
Probability weighting	40%	10%	30%	20%
Liquidity date	3/31/14	12/31/14	12/31/14	6/30/15
Discount rate	35%	35%	35%	35%
Discount for lack of marketability	15%	20%	20%	25%
December 4, 2012 retrospective valuation				
Probability weighting	60%	10%	20%	10%
Liquidity date	12/31/13	12/31/14	12/31/14	6/30/15
Discount rate	35%	35%	35%	35%
Discount for lack of marketability	15%	20%	20%	25%

Based on the qualitative factors described above and the results of our retrospective valuation analysis, we determined that the retrospectively reassessed fair value of our common stock for financial reporting purposes at September 27, 2012 and December 4, 2012 was $3.14 and $5.78 per share, respectively. The stock-based compensation expense associated with stock options granted on September 27, 2012 and December 4, 2012 and reported in our consolidated statement of operations for the year ended December 31, 2012 reflects the retrospectively reassessed value.

Contemporaneous valuation of common stock as of April 15, 2013

In April 2013, we conducted a contemporaneous valuation of our common stock as of April 15, 2013. In assessing the fair value of our common stock, we considered the following factors:

- The potential for accelerated timing of an IPO due our assessment of the current market conditions;
- AG-221, our lead IDH2 compound, substantially completing IND-enabling safety studies and demonstrating a clear safety profile to advance to clinical trials;
- The nomination and acceptance by Celgene of our IDH1 development candidate, AG-120. This was our second cancer metabolism development candidate; and
- Publication of compelling preclinical experiments for IDH2.

Our contemporaneous valuation at April 15, 2013 using the PWERM included an IPO scenario, a high case sale/merger scenario, a low case sale/merger scenario and a dissolution scenario. In order to estimate expected proceeds from each potential exit scenario, we considered the last three years of historical data from the biopharmaceutical industry for both initial public offerings and merger and acquisition transactions. When reviewing the historical data we focused on a representative group of transactions involving biopharmaceutical companies with similar characteristics to us, including development candidates in early stages of drug development and similar areas of therapeutic focus. In addition we also considered the valuation of our last private financing in November 2011. For the IPO scenario, we assumed that all of our preferred shares would convert to common shares. For the high case sale/merger scenario, we assumed that the IPO did not occur, and that we have made significant progress in early clinical trials with one or more of our development candidates. For the low case sale/merger scenario, we assumed that the IPO did not occur, and that we have not made meaningful progress in early clinical trials with one or more drug candidates. For the dissolution scenario, we used estimated proceeds equal to what we believe would be the salvage value of assets upon dissolution. We then determined the estimated timing for each exit scenario and a probability weighting, representing the likelihood of each outcome occurring relative to the others.

We applied a discount rate to the equity values determined for each scenario as of the future exit dates to arrive at the present value of equity under each scenario as of April 15, 2013. Given our stage of development at April 15, 2013, we used a discount rate of 35%. The discount rate was based on the typical venture capital rates of return for companies in the bridge/IPO stage of development, as contemplated by the Practice Aid, which we considered to be the most appropriate given our stage of development and risk profile. Finally, we applied a discount for lack of marketability to each scenario to reflect the impact on the value of our common stock due to its lack of liquidity. The discount for lack of marketability was based on quantitative models (put option calculation) as well as other empirical studies of restricted stock issued by publicly-traded companies and private placements by pre-IPO companies.

The following table summarizes the significant assumptions for each of the valuation scenarios used in the PWERM analysis to determine the fair value of our common stock as of April 15, 2013:

April 15, 2013 valuation assumptions	IPO	Sale-high case	Sale-low case	Dissolution
Probability weighting	70%	15%	10%	5%
Liquidity date	9/30/13	12/31/14	12/31/14	6/30/15
Discount rate	35%	35%	35%	35%
Discount for lack of marketability	10%	15%	15%	20%

Based on the qualitative factors described above and the results of our contemporaneous valuation analysis, we determined that the fair value of our common stock for financial reporting purposes at April 15, 2013 was $9.05 per share.

Stock options granted on April 30, 2013

Our board of directors granted stock options on April 30, 2013, each having an exercise price of $9.05 per share, which our board of directors determined to be the fair value of our common stock on the date of grant. In establishing the exercise price for the grants, our board of directors considered input from management, including the contemporaneous valuation of our common stock as of April 15, 2013, as well as the objective and subjective factors outlined above.

Based on the IPO price of $18.00 per share, the intrinsic value of stock options outstanding as of May 31, 2013 was $58.3 million, of which $36.4 million and $21.9 million would have been related to stock options that were vested and unvested, respectively, at that date.

On July 3, 2013, we and our underwriters determined the preliminary price range for this offering. The midpoint of that price range was $15.00 per share. In comparison, our estimate of the fair value of our common stock was $9.05 per share as of April 30, 2013. We note that, as is typical in IPOs, the preliminary price range for this offering was not derived using a formal determination of fair value, but was determined by negotiation between us and the underwriters. Among the factors that were considered in setting this range were our prospects and the history of and prospects for our industry, the general condition of the securities markets and the recent market prices of, and the demand for, publicly-traded common stock of generally similar companies. In addition, at the time these awards were granted, our underwriters had not yet communicated to us the estimated price range for this offering.

Specifically, we believe that the difference between the fair value of our common stock as of April 30, 2013 that was used to determine the $9.05 per share exercise price of stock options granted on April 30, 2013 and the midpoint of the preliminary price range for this offering was primarily the result of the following company specific and external factors:

Key business milestones:

- On June 20, 2013 we filed an investigational new drug application, or IND, for our first product candidate, AG-221, with the U.S. Food and Drug Administration, or FDA. We believe filing our first IND along with successfully completing all of the related IND-enabling safety and profiling studies was a significant milestone for the Company.
- Subsequent to April 30, 2013, we generated AML mouse models leveraging primary samples from both IDH1 and IDH2 mutant positive patients. With these models we have been able to demonstrate robust efficacy data, which we believe to be an important milestone for both of our IDH2 and IDH1 programs. Specifically, in an IDH2 mutant positive AML model, we were able to reproduce an aggressive form of leukemia. Using our lead IDH2 mutant inhibitor, AG-221, we demonstrated a clear survival advantage in comparison to standard chemotherapy. The efficacy data achieved in our animal models significantly increases our confidence in targeting IDH2 and IDH1 mutations in cancer patients and that our programs have the potential to be single agent therapies.
- In mid-May 2013, AG-348, our lead IEM program, which relates to certain genetic defects of the pyruvate kinase enzyme causing a form of hemolytic anemia known as pyruvate kinase deficiency, or PK deficiency, successfully completed our internal development candidate requirements, which include two species of exploratory safety studies.

Market and other external factors:

- Based upon preliminary discussions with our investors and potential investors, we believe there will be interest in investing in a company with our profile and at our stage of development.
- Since our April 2013 valuation, the market conditions specific to the biotechnology industry continue to perform well and have demonstrated receptivity to investing in earlier stage biotechnology companies, as evidenced by the NASDAQ Biotechnology Index, which was up approximately 10% during the second quarter of 2013, and 15 pre-commercial biopharmaceutical companies completing IPOs during the second quarter of 2013 as compared to four pre-commercial biopharmaceutical companies completing IPOs during the first quarter of 2013 and on average approximately three pre-commercial biopharmaceutical companies completing IPOs per quarter during 2012.
- The estimated initial public offering price range necessarily assumed that the initial public offering had occurred, a public market for our common stock had been created and that our preferred stock converted into common stock in connection with the initial public offering; and, therefore excluded any discount for lack of marketability of our common stock, which was factored into our estimated value on April 30, 2013.
- In addition, our April 2013 valuation used a probability weighting of 70% that this offering would close by September 2013.

- Upon closing of this offering, all outstanding shares of preferred stock will convert into common stock, thus eliminating the superior rights and preferences of our preferred stock as compared to our common stock.

JOBS Act

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

We are in the process of evaluating the benefits of relying on other exemptions and reduced reporting requirements under the JOBS Act. Subject to certain conditions, as an EGC, we intend to rely on certain of these exemptions, including without limitation, (i) providing an auditor's attestation report on our system of internal controls over financial reporting pursuant to Section 404(b) of the Sarbanes-Oxley Act and (ii) complying with any requirement that may be adopted by the PCAOB regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements, known as the auditor discussion and analysis. We will remain an EGC until the earlier of (i) the last day of the fiscal year in which we have total annual gross revenues of $1 billion or more; (ii) the last day of the fiscal year following the fifth anniversary of the date of the completion of this offering; (iii) the date on which we have issued more than $1 billion in nonconvertible debt during the previous three years; or (iv) the date on which we are deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission.

Results of operations

Comparison of three months ended March 31, 2012 and 2013

The following table summarizes our results of operations for the three months ended March 31, 2012 and 2013, together with the changes in those items in dollars and as a percentage:

	Three months ended March 31,			
(in thousands)	2012	2013	Dollar change	% change
Collaboration revenue	$ 6,268	$ 6,268	$ —	— %
Operating expenses:				
Research and development	9,551	11,462	1,911	20.0
General and administrative	1,981	1,852	(129)	(6.5)
Loss from operations	(5,264)	(7,046)	(1,782)	33.9
Interest income	26	8	(18)	(69.2)
(Benefit) provision for income taxes	(607)	190	797	(131.3)
Net loss	$ (4,631)	$ (7,228)	$ (2,597)	56.1%

Revenue. We recorded revenue of $6.3 million for the three months ended March 31, 2013 and 2012 associated with the Celgene agreement.

Research and development expense. Research and development expense increased by $1.9 million to $11.5 million for the three months ended March 31, 2013 from $9.6 million for the three months ended March 31, 2012, an increase of 20%. The increase in research and development expenses was primarily attributable to an

increase of $1.0 million in external services. The increase in external services during the three months ended March 31, 2013 was primarily attributable to the following:

- approximately $0.6 million for external drug discovery efforts, primarily chemistry optimization, for our glutaminase research program;
- approximately $0.2 million for external IND-enabling preclinical studies and manufacturing activities for our lead product candidate targeting IDH2; and
- approximately $0.2 million of costs related to development candidate-enabling preclinical pharmacology and toxicology studies for our lead product candidates targeting PK deficiency and IDH1.

No such external expenses were incurred during the three months ended March 31, 2012 due to each program's early stage of research. In addition, we incurred approximately $0.7 million of additional internal research expenses related to the following:

- additional personnel costs of $0.6 million primarily from additional hires, increasing our internal headcount by 16%; and
- an increase of $0.2 million for facilities related expenses and $0.1 million for research materials related to our expanded research efforts.

General and administrative expense. General and administrative expenses decreased by $0.1 million to $1.9 million for the three months ended March 31, 2013 from $2.0 million for the three months ended March 31, 2012, a decrease of 7%. The decrease in general and administrative expenses was primarily attributable to decreased external legal costs of $0.1 million.

Interest income. Interest income decreased by $18,000 to $8,000 for the three months ended March 31, 2013, from $26,000 for the three months ended March 31, 2012, a decrease of 69%, due to a decrease in the average investment balance and a decrease in interest rates earned on investments.

(Benefit) provision for income tax. The (benefit) provision for income taxes increased by $0.8 million to $0.2 million for the three months ended March 31, 2013, from $(0.6) million for the three months ended March 31, 2012, a decrease of 131%. The increase in the (benefit) provision for income taxes for the three months ended March 31, 2013 was primarily attributable to penalties and interest accrued for the non-payment of U.S. federal income taxes. For the three months ended March 31, 2012, we elected to carry back a portion of our deferred tax assets, including net operating losses, generated in the three months ended March 31, 2012, resulting in a reduction of our 2011 income tax liability and a benefit for income taxes of $0.6 million.

Comparison of years ended December 31, 2011 and 2012

The following table summarizes our results of operations for the years ended December 31, 2011 and 2012, together with the changes in those items in dollars and as a percentage:

	Years ended December 31,			
(in thousands)	2011	2012	Dollar change	% change
Collaboration revenue	$ 21,803	$ 25,072	$ 3,269	15.0%
Grant revenue	34	34	—	—
Total revenue	21,837	25,106	3,269	15.0
Operating expenses:				
Research and development	31,253	41,037	9,784	31.3
General and administrative	7,215	7,064	(151)	(2.1)
Loss from operations	(16,631)	(22,995)	(6,364)	38.3
Interest income	132	69	(63)	(47.7)
Provision (benefit) for income taxes	7,207	(2,824)	(10,031)	(139.2)
Net loss	$ (23,706)	$ (20,102)	$ 3,604	(15.2)%

Revenue. Revenue increased by $3.3 million to $25.1 million in 2012 from $21.8 million in 2011, an increase of 15%. The increase in revenue was the result of a full year of revenue recognized in 2012 associated with Celgene's extension payment of $20.0 million that we received in October 2011.

Research and development expense. Research and development expense increased by $9.8 million to $41.0 million in 2012 from $31.3 million in 2011, an increase of 31%. The increase in research and development expense was primarily attributable to an increase of $5.8 million in external services. The increase in external services in 2012 was primarily attributable to the following:

- approximately $2.9 million of costs for external development candidate-enabling preclinical pharmacology and toxicology studies and IND-enabling preclinical studies and manufacturing activities for our lead product candidate targeting IDH2;
- approximately $2.3 million of costs related to development candidate-enabling preclinical pharmacology and toxicology studies for our lead product candidates targeting PK deficiency and IDH1; and
- approximately $0.6 million of external drug discovery efforts, primarily chemistry optimization, for our glutaminase research program.

No such external expenses were incurred in 2011 due to each program's early stage of research. In addition, we incurred approximately $4.1 million of additional internal research expenses related to the following:

- additional personnel costs of $2.9 million primarily from additional hires increasing our internal headcount by 21%; and
- an increase of $1.2 million for research materials related to our expanded research efforts.

General and administrative expense. General and administrative expense decreased by $0.1 million to $7.1 million in 2012 from $7.2 million in 2011, a decrease of 2%. The decrease in general and administrative expense was primarily attributable to individually insignificant reductions in certain operating and professional services costs.

Interest income. Interest income decreased by $63,000 to $69,000 in 2012, from $132,000 in 2011, a decrease of 48%, due to a decrease in the average investment balance and a decrease in interest rates earned on investments.

Provision (benefit) for income taxes. During 2011, a significant portion of the upfront payment received under the collaboration agreement with Celgene was recognized as revenue for tax purposes, resulting in taxable income for 2011. Accordingly we recorded a provision for income taxes of $7.2 million for the year ended December 31, 2011. During 2012, we elected to carry back certain deferred tax assets, including our net operating losses, generated in the year ended December 31, 2012, resulting in a reduction of our U.S. federal 2011 tax liability and a benefit for income taxes of $2.8 million for the year ended December 31, 2012.

Liquidity and capital resources

Sources of liquidity

Since our inception, and through March 31, 2013, we have raised an aggregate of approximately $261.2 million to fund our operations, of which approximately $141.2 million was through upfront and extension payments related to our collaboration agreement with Celgene, and approximately $120.0 million was from the issuance of preferred stock. As of March 31, 2013, we had $115.8 million in cash, cash equivalents and marketable securities.

In addition to our existing cash, cash equivalents and marketable securities, we are eligible to earn a significant amount of milestone payments under our collaboration agreement. Our ability to earn these milestone payments and the timing of achieving these milestones is dependent upon the outcome of our research and development

activities and is uncertain at this time. Our right to payments under our collaboration agreement is our only committed potential external source of funds.

Cash flows

The following table provides information regarding our cash flows for the years ended December 31, 2011 and 2012, and the three months ended March 31, 2012 and 2013:

	Years ended, December 31,		Three months ended, March 31,	
(in thousands)	2011	2012	2012	2013
Net cash used in operating activities	$(15,219)	$(49,548)	$(15,974)	$(11,981)
Net cash (used in) provided by investing activities	(22,360)	23,042	10,389	4,036
Net cash provided by financing activities	77,358	142	38	25
Net increase (decrease) in cash and cash equivalents	$ 39,779	$(26,364)	$ (5,547)	$ (7,920)

Net cash used in operating activities

The use of cash in all periods resulted primarily from our net losses adjusted for non-cash charges and changes in components of working capital. Net cash used in operating activities was $16.0 million during the three months ended March 31, 2012 compared to $12.0 million during the three months ended March 31, 2013. The decrease in cash used in operating activities in the first quarter of 2013 was driven primarily by a decrease in income taxes payable due to our ability to carry back certain of our deferred tax assets, including our 2012 net operating losses, for U.S. federal income tax purposes and to a payment of approximately $3.5 million for state income tax expense paid in the first quarter of 2012 compared to no income tax payments in the first quarter of 2013. The decrease was partially offset by an increase in net loss of $2.6 million for the three months ended March 31, 2013 as compared to the three months ended March 31, 2012.

Net cash used in operating activities was $15.2 million for the year ended December 31, 2011 compared to $49.5 million for the year ended December 31, 2012. The increase in cash used in operating activities was driven primarily by changes in components of working capital including a decrease in income taxes payable and a decrease in deferred revenue. This was partially offset by a decrease in deferred taxes and a decrease in net loss for the year ended December 31, 2012. The decrease in income taxes payable was due to a payment of approximately $3.5 million for state income tax expense and also our ability to carry back certain of our deferred tax assets, including our 2012 net operating losses, for U.S. federal income tax purposes. The decrease in deferred taxes is related to the utilization of the tax benefits during the year ended December 31, 2012. The decrease in deferred revenue was primarily due to Celgene's extension payment of $20.0 million that we received in October 2011, compared to no collaboration payments received for the year ended December 31, 2012. The decrease in net loss for the year ended December 31, 2012 was also related to revenue recognized for the Celgene extension payment.

Net cash (used in) provided by investing activities

Net cash provided by investing activities was $10.4 million during the three months ended March 31, 2012 compared to $4.0 million during the three months ended March 31, 2013. The cash provided by investing activities for the three months ended March 31, 2013 and 2012 was primarily the result of fewer purchases of marketable securities than the proceeds from maturities and sales of marketable securities.

Net cash used in investing activities was $22.4 million during the year ended December 31, 2011 compared to cash provided by investing activities of $23.0 million during the year ended December 31, 2012. The cash provided by investing activities for the year ended December 31, 2012 was primarily the result of fewer

purchases of marketable securities than the proceeds from maturities and sales of marketable securities, partially offset by purchases of property and equipment of $1.5 million. The cash used in investing activities for the year ended December 31, 2011 was primarily the net result of more purchases of marketable securities than the proceeds from maturities and sales of marketable securities, in addition to purchases of property and equipment of $1.9 million.

Net cash provided by financing activities

Net cash provided by financing activities was $38,000 during the three months ended March 31, 2012 compared to $25,000 during the three months ended March 31, 2013. The cash provided by financing activities for the three months ended March 31, 2013 and 2012 was the result of proceeds received from option exercises and the issuance of common and restricted stock.

Net cash provided by financing activities was $0.1 million during the year ended December 31, 2012 compared to $77.4 million during the year ended December 31, 2011. The cash provided by financing activities for the year ended December 31, 2012 was the result of proceeds received from option exercises and the issuance of common and restricted stock. The cash provided by financing activities for the year ended December 31, 2011 was related to the issuance of 15,882,389 shares of series C convertible preferred stock in November 2011, resulting in net proceeds of $77.3 million and proceeds received from option exercises of $0.1 million.

Funding requirements

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

We expect that the net proceeds from this offering and the concurrent private placement to an affiliate of Celgene, together with our existing cash, cash equivalents and marketable securities, anticipated interest income and anticipated expense reimbursements under our collaboration agreement with Celgene, will enable us to fund our operating expenses and capital expenditure requirements until at least the fourth quarter of 2016. Our future capital requirements will depend on many factors, including:

- the scope, progress, results and costs of drug discovery, preclinical development, laboratory testing and clinical trials for our product candidates;
- the success of our collaboration with Celgene;
- whether Celgene exercises either or both of its options to extend the discovery phase under our collaboration agreement (each of which would trigger an extension payment to us);
- the extent to which we acquire or in-license other medicines and technologies;
- the costs, timing and outcome of regulatory review of our product candidates;
- the costs of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending intellectual property-related claims; and
- our ability to establish and maintain additional collaborations on favorable terms, if at all.

Identifying potential product candidates and conducting preclinical testing and clinical trials is a time-consuming, expensive and uncertain process that takes years to complete, and we may never generate the necessary data or

results required to obtain marketing approval and achieve product sales. In addition, our product candidates, if approved, may not achieve commercial success. Our commercial revenues, if any, will be derived from sales of medicines that we do not expect to be commercially available for many years, if at all. Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. Adequate additional financing may not be available to us on acceptable terms, or at all.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of equity offerings, debt financings, collaborations, strategic alliances and licensing arrangements. We do not have any committed external source of funds, other than our collaboration with Celgene. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends.

If we raise funds through additional collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Contractual obligations

The following table summarizes our significant contractual obligations as of payment due date by period at March 31, 2013:

	Payments due by period				
(in thousands)	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Operating lease obligations(1)	$7,152	$2,280	$4,676	$196	$ —
License agreements(2)	80	80	—	—	—
Purchase obligations(3)	—	—	—	—	—
Total contractual cash obligations	$ 7,232	$2,360	$4,676	$196	$ —

(1) Represents future minimum lease payments under our non-cancelable operating lease. The minimum lease payments above do not include any related common area maintenance charges or real estate taxes.

(2) Consists of two milestone payments of $25,000 each that we are required to pay to University Health Network under our license agreement upon issuance of utility patents, which we expect will occur before the end of 2013, and $30,000 for annual maintenance payments associated with several license agreements. As discussed in Note 6 to the consolidated financial statements appearing elsewhere in this prospectus, we have executed several agreements to license intellectual property. The license agreements require us to pay ongoing annual maintenance payments, initially totaling $30,000 per year and increasing to $65,000 per year beginning in 2016, as well as reimburse certain patent costs previously incurred by the licensors, as applicable. All such reimbursements have been paid as of March 31, 2013. The minimum annual payments are perpetual, however we have not included license maintenance payments beyond 2013 in the contractual obligations table above because the agreements are cancelable by us at any time upon 60-90 days prior written notice to the licensor.

(3) We enter into agreements in the normal course of business with contract research organizations for clinical trials and clinical supply manufacturing and with vendors for preclinical research studies and other services and products for operating purposes. We have not included these payments in the table of contractual obligations above since the contracts are cancelable at any time by us, generally upon 30 days prior written

notice to the vendor. Under these agreements, as of March 31, 2013 we are obligated to pay up to $3.1 million to these vendors.

Other than the specific payments noted in the table of contractual obligations and as described in footnote 2 above, milestone and royalty payments associated with our license agreements have not been included in the above table of contractual obligations as we cannot reasonably estimate if or when they will occur. At this time, no milestone payments, other than the milestone payments included in the table of contractual obligations, are probable of occurrence. Possible future payments under our license arrangements include the following:

- We have agreed to make milestone payments upon achieving various patent-related, clinical development, regulatory and sales-based milestones of up to $0.2 million, $1.6 million, $5.3 million and $3.5 million, respectively, to certain licensors. The license agreements also require that we remit royalties in amounts ranging from 0.5% to 2.5% based on net sales of products utilizing the licensed technology. We are also required to make payments in amounts ranging from 7.0% to 12.5% for non-royalty income received from any sublicense of the rights granted to us under such agreements. None of our lead product candidates utilize technology covered by these license agreements.

- Under our license agreement with The Trustees of the University of Pennsylvania, or Penn, that we entered into in August 2012 to license certain intellectual property rights for the development of diagnostic products to detect the metabolism of certain cancers, we agreed to pay Penn milestone payments of up to an aggregate of $100,000 contingent upon the issuance of certain patents. In addition, for diagnostic products we elect to develop and commercialize under the agreement, we agreed to pay royalties based on worldwide net sales of products. None of our lead product candidates utilize technology covered by our license agreement with Penn.

Off-balance sheet arrangements

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

Quantitative and qualitative disclosures about market risk

We are exposed to market risk related to changes in interest rates. As of December 31, 2012 and March 31, 2013, we had cash, cash equivalents and marketable securities of $128.0 million and $115.8 million, respectively, consisting primarily of investments in U.S. Treasuries and certificates of deposit. 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 marketable securities. Our marketable securities are subject to interest rate risk and could fall in value if market interest rates increase. Due to the short-term duration of our investment portfolio and the low risk profile of our investments, an immediate 10% change in interest rates would not have a material effect on the fair market value of our investment portfolio. We have the ability to hold our marketable securities until maturity, and therefore we would not expect our operating results or cash flows to be affected to any significant degree by the effect of a change in market interest rates on our investments.

We are also exposed to market risk related to change in foreign currency exchange rates. We contract with CROs that are located Asia and Europe, which are denominated in foreign currencies. We are subject to fluctuations in foreign currency rates in connection with these agreements. We do not currently hedge our foreign currency exchange rate risk. As of December 31, 2012 and March 31, 2013, we had minimal or no liabilities denominated in foreign currencies.

Business

We are a biopharmaceutical company passionately committed to applying our scientific leadership in the field of cellular metabolism to transform the lives of patients with cancer and inborn errors of metabolism, or IEMs, which are a subset of orphan genetic metabolic diseases. Metabolism is a complex biological process involving the uptake and assimilation of nutrients in cells to produce energy and facilitate many of the processes required for cellular division and growth. We believe that dysregulation of normal cellular metabolism plays a crucial role in many diseases, including certain cancers and IEMs. We singularly focus our efforts on using cellular metabolism, an unexploited area of biological research with disruptive potential, as a platform for developing potentially transformative small molecule medicines for cancer and IEMs. The lead product candidates in our most advanced programs are aimed at druggable targets which have undergone rigorous validation processes. Our most advanced cancer product candidates, AG-221 and AG-120, which target mutant IDH2 and IDH1, respectively, have demonstrated strong proof of concept in preclinical models and are expected to enter the clinic in mid-2013 and early 2014, respectively. The lead candidate in our IEM program, AG-348, targets pyruvate kinase and is expected to commence clinical development in 2014. We filed an investigational new drug application, or IND, for AG-221 with the FDA on June 20, 2013. To date, we have not filed any other INDs and we have not commenced clinical trials of any of our product candidates.

Our ability to identify, validate and drug novel targets is enabled by a set of core capabilities. Key proprietary aspects of our core capabilities in cellular metabolism include the ability to measure the activities of numerous metabolic pathways in cells or tissues in a high throughput fashion and expertise in "flux biochemistry." This refers to the dynamic analysis of how metabolites, which are intermediates or small molecule products of metabolism, accumulate or diminish as they are created or chemically altered by multiple networks of metabolic enzymes. Complex mathematical modeling of metabolic pathways, enzymatic activity and the flux of metabolites through metabolic enzymatic reactions within diseased tissues allow us to identify novel biological parameters that can be measured to characterize a disease state or the effect of therapy, or biomarkers, and targets for drug discovery.

Our understanding of metabolism within diseased tissues enables the development of methods to measure the effect of a drug on the target of interest and the patient, or pharmacodynamic markers, and patient selection strategies for clinical development. Utilizing our approach we identify altered metabolic pathways within abnormal cells. Altered metabolic pathways generate disease-specific metabolic fingerprints, comprising patterns of metabolite levels, which are the amounts of particular metabolites, that can be exploited in both discovery and development of novel therapeutics. Metabolites make ideal biomarkers because they are readily measured in the target tissues and blood. Metabolic biomarkers can identify appropriate patients for clinical trials, serve as pharmacodynamic markers to characterize medicine/target engagement in patients, and permit the monitoring of patient response to therapy. The clinical development strategy for all of our product candidates will always include initial study designs that allow for genetically or biomarker defined patient populations, enabling the potential for proof of concept early in clinical development, along with the potential for accelerated approval.

We have assembled a set of core capabilities at the intersection of cellular biology and metabolism, centered on the expertise of our founding scientists who are widely considered to be the thought leaders in cancer metabolism—Lew Cantley, Ph.D. (director of the Cancer Center at Weill Cornell Medical College and New York Presbyterian Hospital), Tak Mak, Ph.D. (professor of medical biophysics, University of Toronto) and Craig Thompson, M.D. (president and CEO of Memorial Sloan-Kettering Cancer Center)—as well as on the strength of our management team, including our CEO, David Schenkein, M.D., and a group of world class scientists. We have built an exceptional team of cancer biologists, enzymologists and a core group of metabolomic experts that interrogate cellular metabolism to identify key metabolic targets and biomarkers in cancer and IEMs. Our scientists have published 11 scientific papers since 2009, including four in *Nature* and three in *Science*. We have also established an intellectual property portfolio consisting of over 100 patent applications worldwide, including multiple patent applications directed to our lead product candidates, together with trade secrets, know-how and continuing technological innovation.

Our initial therapeutic area of focus is cancer. We are leveraging our expertise in metabolic pathways to discover, validate, develop and commercialize a pipeline of novel drug candidates. In April 2010, we entered into a collaboration agreement with Celgene focused on cancer metabolism. Under the collaboration, we are leading discovery, preclinical and early clinical development for all cancer metabolism programs. The discovery phase of the collaboration expires in April 2014, subject to Celgene's option to extend the discovery phase for up to two additional years. Celgene has the option to obtain exclusive rights for the further development and commercialization of certain of these programs, and we will retain rights to the others. We may elect to participate in a portion of sales activities for the medicines from such programs in the United States. In addition, for certain of these programs, we may elect to retain full rights to develop and commercialize medicines from these programs in the United States. Through March 31, 2013, we have received approximately $141.2 million in payments from Celgene and $37.5 million in equity investments. We are also eligible to receive extension payments, payments upon the successful achievement of specified milestones, reimbursements for certain development expenses and royalties on any product sales.

We believe that our competitive advantage and singular focus in understanding cellular metabolism has created disruptive knowledge in biology that we can exploit for the development of transformative medicines in cancer. Because there has not previously been a systematic approach to drug discovery in this field, we have had to demonstrate significant major advances, including:

- identification of unique and specific metabolic enzymes that are altered from normal cells within cancer cells and are directly involved in the pathogenesis of cancer;
- creation of selective small molecules with drug-like properties that preferentially target disease-associated enzymes;
- achievement of pharmacologic efficacy in *in vitro* and *in vivo* models; and
- discovery of novel biomarkers that identify the appropriate patients for clinical trials.

Our two most advanced cancer programs are targeting mutations in the enzymes isocitrate dehydrogenase 1 and 2, referred to as IDH1 and IDH2. Both program targets are genetically validated, which means the importance of such targets have been demonstrated based on genetics, and represent two of the most promising metabolic targets in cancer biology, as concluded by the leading scientific journal *Nature* in 2011. Extensive publications led by Agios scientists validate our belief that these mutations are initiating and driving events in many cancers. These two otherwise normal metabolic enzymes are mutated in a wide range of cancers, including both solid tumors and hematological malignancies. Our drug candidates are selective for the mutated form of IDH1 and IDH2 found in cancer cells versus the normal forms of IDH1 and IDH2 found in all other cells. We expect to commence clinical trials in patients with IDH2-mutation positive cancers with AG-221, the lead candidate in our IDH2 program, by mid-2013. In the IDH1 program, we expect to commence clinical trials in patients with IDH1-mutation positive cancers with our lead development candidate, AG-120, by early 2014. In our Celgene collaboration, we have retained the option for exclusive rights to develop and commercialize AG-120 in the United States.

We are also focused on developing medicines to address IEMs, with a novel approach to orphan diseases for which no effective or disease-modifying therapy is currently available. A hallmark of IEMs is abnormal cellular metabolic activity due to a genetic defect, which results in the accumulation or deficit of certain metabolites or proteins, disrupting normal metabolic functions. We utilize stringent criteria when identifying which IEMs Agios will pursue. We focus on IEMs with a common set of attributes:

- single gene, single disease (i.e., monogenic disorders);
- high unmet medical need with evidence that there is progressive disease post-birth that can be addressed with therapy; and
- an adequate number of patients for prospective clinical trials.

We apply our core capabilities in exploring cellular metabolism to identify key cellular targets in affected cells and design novel small molecules with the potential to correct the metabolic defect in patients afflicted with these diseases. We have successfully used this approach in our most advanced IEM program —pyruvate kinase deficiency, or PK deficiency, a rare form of hereditary hemolytic anemia. The disease is characterized by mild to severe forms of anemia. There are no currently available treatments other than supportive care, which includes splenectomy, transfusion support and chelation, which refers to the removal of excess iron from the human body with a therapeutic agent. Our lead development candidate, AG-348, is a potent, orally available small molecule activator of the PKR enzyme, an isoform of PK that, when mutated, leads to PK deficiency. Our current plan is to enter clinical trials in patients with PK deficiency in 2014.

Our strategy

We aim to build a multi-product company, based on our expertise in cellular metabolism, that discovers, develops and commercializes first- and best-in-class medicines to treat cancer and IEMs. Key elements of our strategy include:

- ***Aggressively pursuing the development of novel medicines to transform the lives of patients with cancer and IEMs:*** We believe that our singular focus on applying our expertise in cellular metabolism to discover and develop novel treatments for cancer and IEMs will enable us to identify and develop transformative, disease-modifying therapies. Under our collaboration with Celgene, since 2010 we have identified two development candidates that we expect will enter clinical trials in mid-2013 and early 2014. We have also identified a development candidate in our IEM program that we anticipate will enter clinical trials in 2014.
- ***Maintaining our competitive advantage and singular focus in the field of cellular metabolism:*** Agios has developed core capabilities in chemistry, biology, metabolism and informatics, which have enabled us to unlock a new field of discovery in cellular metabolism. We believe that we are a leader in this field, and we are committed to maintaining and expanding our proprietary technology base to enable us to remain at the forefront of cellular metabolism research and development.
- ***Continuing to build a product engine for cancer and IEMs to generate novel and important medicines:*** We will leverage our core expertise, commitment to science and our platform technology in cellular metabolism to identify and drug novel targets in both cancer and IEMs. We will continue to invest in building this robust discovery engine as lead molecules enter the clinic to generate novel and important medicines.
- ***Building a preeminent independent biopharmaceutical company by engaging in discovery, development and commercialization of our medicines:*** We aspire to become one of the great biopharmaceutical companies. We have aggregated a group of world class scientists with renowned science and technology capabilities, which, when coupled with our strong intellectual property position, the culture of our organization and the structure of our partner relationships, enable Agios to have a meaningful impact on the discovery, development and commercialization of our potential medicines. In our collaboration with Celgene, we have retained U.S. development and commercialization rights to certain programs, and may elect to participate in a portion of sales activities in the U.S. for the medicines in all remaining programs. We retain global development and commercialization rights to our IEM programs.
- ***Maintaining a commitment to precision medicine in drug development:*** We intend to utilize our expertise in cellular metabolism to identify and validate novel disease targets and relevant biomarkers, which enables us to develop highly selective and specific drug candidates for cancer and IEMs. We then intend to use these biomarkers to rigorously select patients for clinical trials and to design studies with potential for rapid proof of concept along with the potential for accelerated approval.

Our guiding principles

We aim to build a long-term company with a disciplined focus on developing medicines that transform the lives of patients with cancer and IEMs. We maintain a culture of high integrity that embraces the following guiding principles, which we believe will provide long-term benefits for all our stakeholders:

- ***Follow the science and do what is right for patients.***
- ***Maintain a culture of incisive decision-making driven by deep scientific interrogation and "respectful irreverence."***
- ***Foster collaborative spirit that includes all employees regardless of function or level.***
- ***Leverage deep strategic relationships with our academic and commercial partners to improve the quality of our discovery and development efforts.***

Our focus—cellular metabolism

Cellular metabolism refers to the set of life-sustaining chemical transformations within the cells of living organisms. The conversion of nutrients into energy via enzyme-catalyzed reactions allows organisms to grow and reproduce, maintain their structures, and respond to their environments. The chemical reactions of metabolism are organized into metabolic pathways, in which one chemical is transformed through a series of steps into another chemical, by a sequence of enzymes. Enzymes catalyze quick and efficient reactions, serve as key regulators of metabolic pathways, and respond to changes in the cell's environment or signals from other cells. We believe our deep understanding of metabolic pathways within normal cells enables us to identify altered metabolic pathways within abnormal cells such as in rapidly proliferating cancers and IEMs.

Fundamental differences in the metabolism of normal cells and rapidly proliferating cancer cells were first discovered by Otto Warburg more than 80 years ago —an observation that earned him the Nobel Prize. Warburg demonstrated that in contrast to normal cells, which convert nutrients, such as sugar, into energy via a process known as the Krebs cycle, cancer cells ferment their sugar into lactic acid—a process known as aerobic glycolysis. It is now known that this allows the cancer cells to generate the building blocks they need to grow rapidly. The ability of the cancer cell to "rewire" its metabolic pathways to fuel its growth and survival has spawned an entirely new field of cancer biology known as cancer metabolism or tumor metabolism. It is only in the last decade that scientists have developed sophisticated tools to interrogate and evaluate metabolism within cancer or rapidly dividing cells. Agios' founders and scientific advisors have largely driven this intense focus on studying the metabolism of cancer cells.

Cancer metabolism is a new and exciting field of biology that provides a fundamentally different approach to treating cancer. Cancers become addicted to certain fuel sources and inherently alter their cellular machinery to change how they consume and utilize nutrients. Cancer cells increase the transport of nutrients into the cell by 200-400 fold compared to normal cells while also mutating metabolic enzymes to generate metabolites that fuel growth and altering gene expression of enzymes to divert energy production. Collectively, these changes afford cancer cells the ability to generate the building blocks that drive tumor growth. Inhibiting key enzymes in cancer cell specific metabolic pathways has the potential to disrupt tumor cell proliferation and survival without affecting normal cells, thus providing a powerful new intervention point for discovery and development of novel targeted, cancer therapeutics. We believe that this is an entirely novel approach to treating cancer, and our research is directed at identifying such metabolic targets and discovering medicines against them.

Validation of the concept of cancer cell metabolic rewiring and excessive nutrient uptake comes from the widespread use of positron emission tomography, or PET, to detect cancers. This medical imaging technology relies on the uptake of nutrients, namely sugar, into cells. Patients are injected with a radioactively labeled form of sugar, which is more rapidly consumed by cancer cells given their profound requirement for nutrients relative to normal tissues. PET imaging precisely locates cancerous areas throughout the body and provides for both a diagnostic and prognostic tool throughout cancer therapy.

The metabolic rewiring of cancer cells can also be linked to specific genetic alterations in oncogenes (which are genes that transform normal cells into tumor cells) and tumor suppressor genes (which are genes that are anti-oncogenic) responsible for cell signaling. These mutations in signaling pathways can drive excessive uptake of nutrients and altered metabolic pathways, thereby causing cancer formation. This cross-talk between cell signaling and metabolism offers multiple opportunities to treat cancer by combining Agios therapies directed against metabolic enzymes with existing or emerging standards of care.

In cancer, our target universe for creating novel transformative medicines is derived from the human cellular metabolic machinery, referred to as the "metabolome," containing 2,000-3,000 cellular metabolic enzymes, from which we anticipate that there will likely be between 50-100 novel targets for oncology. This represents one of the largest unexploited new classes of important targets in oncology. The Agios team has already studied more than 50 metabolic enzymes as possible important cancer targets. With our focus on targets that are distinct in cancer versus normal cells, we believe that they are likely to fall within three broad categories:

- a mutation leading to a unique metabolic enzyme only found in cancer;
- unique isoforms of metabolic enzymes that are found in the cancer and that are different in normal cells; and
- dysregulation of an entire metabolic pathway to feed the cancer's need for a specific metabolite or nutrient.

An understanding of metabolic pathways based solely on traditional biochemistry would underestimate the pervasive role of metabolism in essentially every aspect of biology. Recent work has demonstrated that many human diseases involve altered cellular metabolism—often genetically programmed—that disrupts normal physiology and leads to severe tissue dysfunction. Another area of unmet medical need is IEMs, severe and often life-threatening inherited childhood and adult diseases caused by a defect in a metabolic enzyme or pathway. Our core capabilities to interrogate the metabolic pathway of the disease have allowed us to create potential medicines that can restore the metabolic balance and potentially lead to disease-modifying therapies for these orphan diseases. Our approach is designed to develop treatment for the "right" patient identified by the genetic and metabolic alteration marked by their inherited disease.

Our core capabilities and science

We believe that our capabilities in understanding both static and dynamic aspects of cellular metabolism are rare in the industry as demonstrated by our ability to identify and validate four novel, druggable targets. Among our key core capabilities to identify and validate novel enzyme targets are:

- ***Measurement of metabolites and metabolic pathways in cells and tissues using high throughput mass spectrometry.***
- ***Identification of candidate metabolic enzymes using flux biochemistry:*** In many circumstances, cancers and normal cells utilize multiple routes to produce the same metabolite. To identify the relevant target, we evaluate the kinetics of enzymes to determine the speed at which metabolites are moving along enzymatic pathways. This critically important technology is called "flux biochemistry" and is distinguished from the more conventional "static" metabolomics view. Flux biochemistry, by labeling the nutrients, allows us to create a pathway map by measuring the rate of filling and emptying of metabolic pools. This methodology, which precisely measures the rate at which a nutrient source is broken down and reassembled into cellular building blocks and biochemical energy, has been automated in a high throughput fashion at Agios. Experimental data is integrated with mathematical modeling of enzyme pathways to generate an accurate understanding of the metabolic dysregulation. This allows us to determine which enzyme is the "Achilles' Heel" of a particular cancer or IEM.
- ***Mining of genomic data emerging from the public cancer genome sequencing efforts, utilizing our state of the art genomics and bioinformatics capabilities, to identify metabolic enzymes that are mutated or amplified in tumors:*** This provides insight into novel targets for therapy while facilitating a precision medicine approach to patient selection based on the genetic defect (e.g., mutant IDH1 and IDH2).

- ***Development of a multiplexed, barcoded RNAi depletion screening strategy, enabling us to interrogate the entire metabolome in a single experiment, both in cells and in tumor bearing animals:*** This technology allows us to identify novel targets in cancers of interest.
- ***Inhibition and activation of metabolic enzymes using structure-based design from crystal structures, computational chemistry, and high throughput chemical and fragment library screening*** .

Our approach to drug discovery and development, and the utilization of precision medicine

We intend to apply our deep understanding of metabolism, coupled with our ability to create medicines that can inhibit or activate metabolic enzymes, to fundamentally change the way cancer and IEMs are treated. We have the ability to identify and validate novel and druggable targets in both cancer and IEMs.

We begin the process to find and validate new targets by evaluating a cancer's dependency on certain nutrients or enzymes in comparison to normal cells. We then utilize a number of techniques to determine if the cancer is dependent on the identified enzyme. The candidate enzyme target is inactivated, or turned off using genetic tools, first in tissue culture and then in xenograft models, in which representative tumors have been implanted in animals. Once inactivated, we can determine if turning off the enzyme stops the growth of the cancer cells *in vitro* and slows or stops the growth of a tumor in the xenograft model. If our findings are positive, we begin the process of searching for biomarkers that will enable our precision medicine approach of identifying the right patients to be eventually treated. In the early stages of biomarker development, we create a responder hypothesis, comparing the molecular genetics and metabolite patterns between cancers that respond to treatment to those that do not respond to enzyme inhibition. The process to design a small molecule drug candidate begins by determining the crystal structure of the enzyme. We create candidate molecules using structure-based design coupled with high throughput chemical screening, searching for small molecules that can inhibit the enzyme. The decision to enter the final and most expensive part of drug discovery, which is the refinement of the small molecule product candidates, is only made when we have completed all of these critical steps. The target is then considered "validated". This rigorous process only allows the most promising programs to enter the last stage of drug discovery. Agios has been successful at fully validating four novel cancer targets to date with an additional ten novel targets currently in various stages of the validation process. We have also "de-validated" and terminated numerous programs, including many that have been reported in scientific journals.

In our IEM portfolio, we use an equally rigorous set of validation techniques. We begin with an assessment of scientific literature and disease and genomic databases, applying text and data mining techniques, to identify IEMs that are caused by a mutation in a single metabolic enzyme, referred to as monogenic disorders. We perform a full evaluation of the clinical aspects of the disease, which includes an understanding of the severity of the disease, the progression of the disease manifestations post-birth and currently available treatments. We intend to focus only on diseases of a severe nature for which there are no available effective treatments, where intervention is likely to ameliorate disease manifestations, and where there are an adequate number of patients to conduct appropriate clinical trials. We conduct a detailed mutational and structural analysis of the metabolic enzyme and the entire pathway of interest to determine the scientific feasibility of intervention using small molecules to restore metabolic balance within the diseased cell. As in our efforts to develop therapeutics for cancer, we create a crystal structure of the enzyme to begin the process of drug design. We make candidate tool molecules using structure-based design coupled with high throughput chemical screening. To fully evaluate the potential of our lead molecules to lead to disease modifying effects we strive to develop an animal model of the disease by genetically inserting the mutated enzyme into animals ("knock-in mouse model"). Agios has selected a product candidate for the treatment of PK deficiency to advance into clinical development. Drug discovery for an additional four IEMs are in various stages of research.

We will only progress drug candidates forward into phase 1 trials if we have the ability to select patients who are most likely to respond to a given therapy based on genetic or metabolic biomarkers. While many factors are considered critical to maximize the probability of technical success in the drug development process, perhaps

none is more important than identifying highly specific and selective molecules aimed at the best possible targets for therapy coupled with the patients most likely to respond to that therapy. Our goal is to develop increasing confidence in the target and the patient population prior to entering human clinical trials and then initiate those first human trials in a patient population that has been selected based on target dependence using a biomarker. This approach, known as personalized or precision medicine, is used in the industry to lead to the potential for clear proof of concept in early human trials.

We believe our approach to drug discovery and development will lead to transformative medicines for patients. We plan to partner closely with worldwide regulatory authorities and to utilize all available methodologies such as orphan, fast track, accelerated approval and/or breakthrough therapy designations as appropriate. We expect that conducting clinical trials with a targeted agent in the appropriate clinical population has the potential to lead to very rapid development timelines. There are now multiple examples within oncology of drugs against novel targets that have progressed from first in human trial to regulatory approval in less than five years (e.g., Gleevec®, VELCADE® and Xalkori®).

Our development programs

We have leveraged our core capabilities in cellular metabolism to build a research and development engine that is focused in the therapeutic areas of cancer and IEMs. This engine has permitted us to discover proprietary first-in-class orally available small molecules as potential lead product candidates for each of several novel programs in preclinical development. All of our lead programs focus on diagnostically-identified patient populations with the potential for clinical proof of concept early in clinical development, along with the potential for accelerated approval.

The following table summarizes key information about our most advanced product candidates, each of which is described and discussed in further detail below:

Product candidate	Biomarker(s)	Initial indications	Stage of development	Commercial rights
Cancer metabolism programs:				
AG-221 (IDH2 mutant inhibitor)	Genotyping of IDH2 mutation; 2HG	All cancer patients with an IDH2 mutation in the following diseases: acute myelogenous leukemia, high risk myelodysplasia and myeloproliferative disorders, angio-immunoblastic non-Hodgkins T cell lymphoma, glioma, chondrosarcoma and other solid tumors	IND filed	Agios: U.S. sales participation rights Celgene: worldwide rights
AG-120 (IDH1 mutant inhibitor)	Genotyping of IDH1 mutation; 2HG	All cancer patients with an IDH1 mutation in the following diseases: glioma, chondrosarcoma, cholangiocarcinoma, acute myelogenous leukemia, high risk myelodysplasia and myeloproliferative disorders, and other hematological and solid tumors	IND-enabling activities	Agios: option on 100% of U.S. rights Celgene: ex-U.S. rights; worldwide rights if Agios option is not exercised
Glutaminase (Glutaminase inhibitor)	To be determined	Cancer patients with various subsets of tumors dependent on glutaminase	Late research	Agios: if option on AG-120 U.S. rights not exercised, we retain an option on 100% of U.S. rights Celgene: worldwide rights if option on AG-120 U.S. rights exercised; ex-U.S. rights if AG-120 U.S. rights not exercised and we exercise our option on glutaminase U.S. rights
Inborn errors of metabolism programs:				
AG-348 (Pyruvate kinase (R) activator)	Genetic testing for mutation in the pyruvate kinase R gene	Patients with pyruvate kinase deficiency	IND-enabling activities	Agios: worldwide rights
AG-221 or other mutant inhibitor (IDH2 mutant inhibitor)	Genotyping of IDH2 mutation; 2HG	Patients with Type II D-2-hydroxyglutaric aciduria	Research	Agios: U.S. sales participation rights Celgene: worldwide rights

Cancer

Background

In most cases of advanced cancer, the diagnosis still represents a death sentence to patients and their families.

The American Cancer Society estimates that 1.66 million new cancer cases will be diagnosed in the U.S. in 2013. According to the Society, about 580,000 Americans and 7.6 million people worldwide will die of cancer in 2013. Cancer is the second leading cause of death in the United States, exceeded only by heart disease. Lung, colon and rectal, breast, and prostate cancer are the most prevalent cancers. Causes of cancer include environmental factors such as tobacco, chemicals, radiation and diet, genetic factors, such as inherited mutations, and endogenous hormone levels, and associated medical conditions such as certain viral infections and immunodeficiency.

Cancer is a disease characterized by unregulated cell growth. Cancer typically develops when the repair of genetic material in normal cells begins to fail and genes that regulate cell growth become disrupted. Carcinogens, or cancer causing agents, such as radiation, chemicals and hormones, can trigger changes to the genetic material of a cell, and typically prompt this disruption. Cells that have been disrupted may become cancerous, leading to changes in the cells' DNA, and ultimately uncontrolled growth. Cancer cells can spread to other areas of the body, or metastasize, and form tumors, which can destroy normal tissue or organs. Risk factors for cancer include family history, age, diet, and exogenous factors, such as exposure to ultraviolet sunlight and smoking. Cancers can be classified in stages to document disease severity, measured in stages of I to IV, generally based on tumor size, involvement of lymph nodes, and metastases.

The most common methods of treating patients with cancer are surgery, radiation and drug therapy. A cancer patient often receives treatment with a combination of these methods. Surgery and radiation therapy are particularly effective in patients in whom the disease is localized. Physicians generally use systemic drug therapies in situations in which the cancer has spread beyond the primary site or cannot otherwise be treated through surgery. The goal of drug therapy is to kill cancer cells or to damage cellular components required for rapid growth and survival of cancer cells. In many cases, drug therapy entails the administration of several different drugs in combination. Over the past several decades, drug therapy has evolved from non-specific drugs that kill both healthy and cancerous cells to drugs that target specific molecular pathways involved in cancer.

Cytotoxic chemotherapies

The earliest approach to cancer treatment was to develop drugs, referred to as cytotoxic drugs, that kill rapidly proliferating cancer cells through non-specific mechanisms, such as disrupting cell metabolism or causing damage to cellular components required for survival and rapid growth. While these drugs, (e.g. CYTOXAN®, Adriamycin®) have been effective in the treatment of some cancers they act in an indiscriminate manner, killing healthy as well as cancerous cells. Due to their mechanism of action, many cytotoxic drugs have a narrow dose range above which the toxicity causes unacceptable or even fatal levels of damage and below which the drugs are not effective in eradicating cancer cells.

Targeted therapies

The next approach to pharmacological cancer treatment was to develop drugs, referred to as targeted therapeutics, that target specific biological molecules in the human body that play a role in rapid cell growth and the spread of cancer. Targeted therapeutics are designed to preferentially kill cancer cells and spare normal cells, to improve efficacy and minimize side effects. The drugs are designed to either attack a target that causes uncontrolled growth of cancer cells because of either a specific genetic alteration primarily found in cancer cells but not in normal cells or a target that cancer cells are more dependent on for their growth in comparison to normal cells. Examples of effective targeted therapies include Herceptin ®, Avastin® and Zelboraf®.

Emerging areas

Several new approaches to develop novel cancer treatments are underway. They include: treatment with drugs or other methods that stimulate the normal immune system to attack the cancer; antibody drug conjugates (Kadcyla ™) that carry a powerful chemotherapy payload that is only released into the cancer cell; and drugs that target the proteins that coat the DNA in cancer cells (epigenetics).

We believe that interrogating altered cellular metabolism—the way cancers take up and break down their nutrients—will lead to a new wave of important cancer treatments. Further, we believe that we must utilize a precision medicine approach, which will enable us to only enroll patients in clinical trials based on a biomarker likely to predict response and benefit.

Programs in isocitrate dehydrogenase (IDH)

The isocitrate dehydrogenase (IDH) protein is a critical enzyme in the citric acid cycle, also known as the tricarboxylic acid, or Krebs, cycle. The Krebs cycle is centrally important to many biochemical pathways, and is one of the earliest established components of cellular metabolism. The Krebs cycle converts an essential cellular metabolite called isocitrate into another metabolite, alpha-ketoglutarate (α-ketoglutarate), both of which are critically important for cellular function and the creation of energy. In humans, there are three forms of the IDH enzyme (IDH1, IDH2, and IDH3) but only IDH1 and IDH2 appear to be mutated in cancers. IDH1 and IDH2 catalyze the same reaction but in different cellular compartments: IDH1 is found in the cytoplasm of the cell and IDH2 in the mitochondria. Tumor cells are generally observed to carry either an IDH1 or IDH2 mutation, but not both.

We have identified selective development candidates that target the mutated forms of IDH1 and IDH2 which are each found in a wide range of solid and hematological cancers. We and our collaborators have demonstrated that these mutations initiate and drive cancer growth by blocking differentiation, also referred to as maturation, of primitive cells which leads to tumor formation and maintenance. We believe that inhibition of these mutated proteins, and not their normal counterparts, may lead to clinical benefit for the subset of cancer patients whose tumors carry these mutations.

Agios research in IDH mutations in cancer

Academic researchers first identified mutations in either IDH1 or IDH2 in over 70% of patients with brain tumors, also known as gliomas. They also demonstrated that the mutated form of the enzyme IDH was no longer able to conduct its normal function of converting the metabolite isocitrate into alpha-ketoglutarate. Our scientists decided to examine the mutated pathway using our metabolic platform and discovered that the mutated IDH enzymes had adopted a novel “gain of function” activity that allows only the mutated IDH enzyme to produce large amounts of a metabolite called 2–hydroxygluturate, or 2HG. This discovery was the subject of the first Agios publication in the scientific journal *Nature* (Dang et al 2009), and was subsequently deemed by *Nature* to be one of the most important recent discoveries in cancer research.

We believe that the excessive levels of the metabolite 2HG produced by the tumor, fuel cancer growth and survival via multiple cellular changes that lead to a block in cell maturation, or differentiation. Recently, two published preclinical studies confirm that 2HG promotes tumorigenesis and that the effects of 2HG can be reversed with an IDH1 or IDH2 mutant specific inhibitor. 2HG is also an ideal biomarker to identify and follow cancer patients as they receive treatment with an IDH mutant specific inhibitor. In normal cells, 2HG is present at extremely low levels. However, in cancer cells that carry the IDH mutation, 2HG is produced at massively higher levels than in normal cells. It can easily be detected in samples from cancer specimens and in the blood of certain cancer patients. In patients with brain tumors it can also be imaged on an MRI.

In a cell based model it was demonstrated that the IDH1 mutation (R132H) promotes growth factor independence (i.e., transformation into cancerous cells) and blocks differentiation in primitive cells that produce all the cells circulating in the blood, referred to as primitive hematopoietic cells. It was also demonstrated in this model that the cell’s transformation into cancer could be driven solely by the metabolite 2HG without any mutant enzyme. Lastly

the transformation by IDH1 mutation was reversible with the use of an IDH1 mutant inhibitor. (*Science* Kaelin et al 2013). These results are illustrated in the graph below.

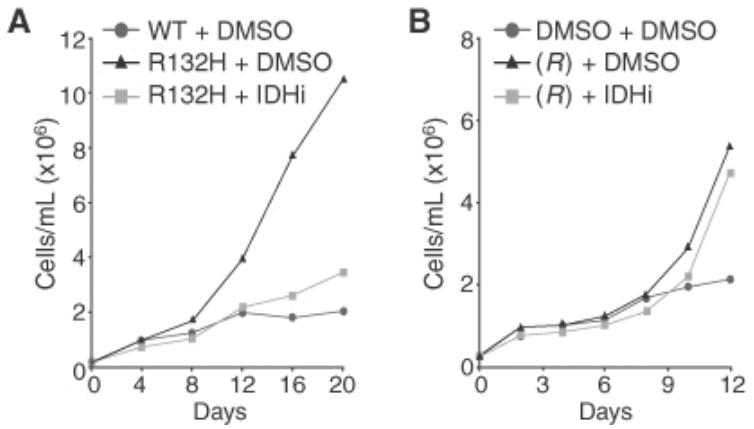
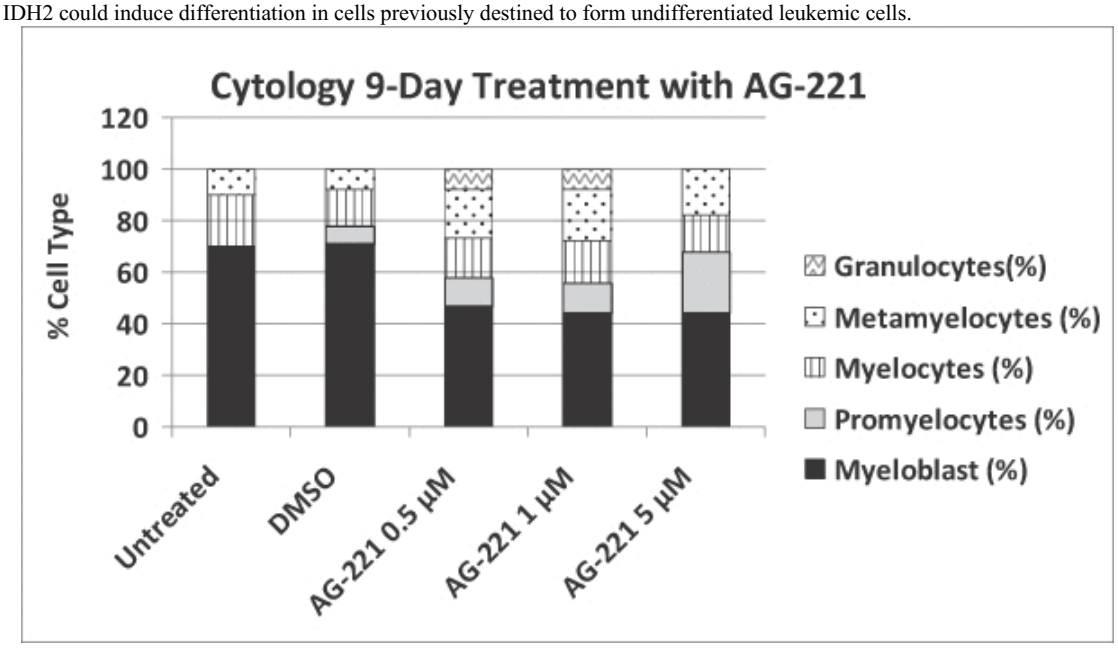


Figure A demonstrates that insertion of R132H IDH1 mutation into TF-1 cells leads to growth factor independence which can be reversed by the addition of an Agios IDH1 inhibitor. ***Figure B*** demonstrates that this transformation to growth factor independence can be replicated solely by the addition of 2HG(R). As expected, the IDH1 inhibitor has no effect on the ability of exogenously administered 2HG to transform cells.

An *ex vivo* model is shown in the figure below, in which human acute myelogenous leukemia, or AML, bone marrow cells removed directly from a patient with a leukemia positive for an IDH2 mutation were maintained in short term culture. Treatment with the Agios clinical candidate at concentrations achievable *in vivo* revealed a significant decrease in leukemia cells (myeloblasts) associated with evidence that normal cell maturation is returning, as noted by the increase in normal maturing cells (promyeocytes, myeocytes, metamyelocytes and granulocytes). These data provide *ex vivo* proof of concept that inhibitors targeting mutant IDH2 could induce differentiation in cells previously destined to form undifferentiated leukemic cells.



Taken together, these data provide compelling evidence that IDH1 or IDH2 mutant inhibitors induce differentiation in both cell based models and primary patient samples. The best example of an approved treatment that can reverse the block in differentiation induced by a mutation is all trans-retinoic acid (ATRA) for the treatment of acute promyelocytic leukemia. This single agent leads to complete responses in this form of leukemia, which is driven by a genetic alteration in the retinoic acid receptor, and is proof of principle that differentiation therapy can lead to major clinical activity in patients with acute leukemia.

Recently we have been able to generate AML mouse models leveraging primary samples from both IDH1 and IDH2 mutant positive patients. In an IDH1 mutant positive AML model, after 28 days of treatment with an Agios IDH1 mutant inhibitor, we were able to demonstrate early signs of single agent activity and synergy in combination with chemotherapy. In an IDH2 mutant positive AML model, we were able to reproduce an aggressive form of leukemia. Using our lead IDH2 mutant inhibitor AG-221, we demonstrated a dose dependent survival advantage in comparison to standard chemotherapy. The group of animals receiving the highest dose of AG-221 all survived until the study was completed. A dose dependent decrease in leukemia and evidence of normal differentiation was seen in all AG-221 treated animals. As we enter clinical development, these models will inform our early strategies in designing single agent and combination clinical studies.

Incidence of IDH mutations

To date, IDH1 and IDH2 mutations have been found to be prevalent in both solid and hematologic tumors. Mutations in IDH1 were identified through a genome-wide mutation analysis in glioblastoma multiforme, or GBM, the most common and aggressive type of brain cancer. High throughput deep sequencing revealed the presence of mutations in either IDH1 or IDH2 in more than 70% of grade II-III gliomas and secondary glioblastomas. Subsequent sequencing efforts revealed alterations in these two genes across additional cancers, including hematologic malignancies. Mutations in IDH1 and IDH2 are generally mutually exclusive and occur at very early stages of tumor development suggesting that they can promote tumorigenesis.

- IDH2 mutations appear to be most prevalent in hematologic tumors. Among patients with AML, IDH2 mutations have been observed in 15% of adult patients. Outside of AML, IDH2 mutations are found in a subset of other hematologic and non-hematologic cancers. Sequence analysis has shown that IDH2 mutations occur in approximately 5% of patients with myelodysplastic syndrome, or MDS, or myeloproliferative neoplasms, or MPN. IDH2 mutations have also been found in several solid tumor types such as melanoma, glioma and chondrosarcoma.
- IDH1 mutations appear to be most prevalent in solid tumors. Among patients with gliomas (low grade glioma and secondary glioblastoma), IDH1 mutations have been observed in 70% of patients. Outside of gliomas, mutations have been found in a subset of other solid and hematologic cancers. Importantly, mutations in IDH1 have been identified in difficult to treat cancers such as chondrosarcoma and cholangiocarcinoma where both the treatment options and prognosis for patients are poor. IDH1 mutations have also been found in several other solid tumor types such as colon, melanoma and lung.

The following table summarizes our current estimates on the prevalence of IDH2 and IDH1 mutations in hematologic and solid tumors. We believe our estimates may expand as more cancer treatment centers screen for these IDH mutations.

Mutation	Indications	% with IDH mutations	Estimated patients per year(1)
IDH2	AML	15%	7,200
	MDS/MPN	5%	2,000
	Angio-immunoblastic T cell NHL	25%	400
	Others (melanoma, glioma, chondrosarcoma)	3-5%	1,500
	Total		**11,100**
IDH1	Grade II, III glioma & secondary GBM	70%	11,000
	Chondrosarcoma	>50%	4,600
	AML	7.50%	3,600
	MDS/MPN	5%	2,000
	Cholangiocarcinoma	20%	1,600
	Others (colon, melanoma, lung)	1-2%	8,000
	Total		**30,800**

(1) Estimated U.S., Europe and Japan incidence

AG-221: lead IDH2 program

AG-221 is an orally available, selective, potent inhibitor of the mutated IDH2 protein, making it a highly targeted therapeutic candidate for the treatment of patients with cancers that harbor IDH2 mutations, including those with AML. Based on our established non-clinically-based target profiling, as well as non-clinical *in vitro* and *in vivo* efficacy data, there is a clear rationale to develop AG-221 in defined target populations that harbor the IDH2 gene mutation.

We have conducted exploratory pharmacology studies to develop a model of IDH mutant-induced tumorigenesis and to characterize the binding, inhibition, and selectivity of AG-221. AG-221 is a potent inhibitor of the IDH2 mutant protein. We have demonstrated in *in vitro* experiments that exposure to AG-221 reduces 2HG levels to those found in normal cells, reverses 2HG-induced histone hypermethylation, and induces differentiation in multiple leukemia cell models. Targeted inhibition of the IDH2 mutant also reversed the differentiation block in both TF-1 leukemia cells and primary AML cells derived from patients.

We have successfully completed IND-enabling studies on AG-221. The molecule has excellent pharmacological properties with a wide therapeutic index, and has demonstrated a clear safety profile to advance into clinical trials. We have obtained materials for AG-221 for our planned phase 1/2 testing from third party manufacturers. We filed an IND for AG-221 with the FDA on June 20, 2013 and we plan to initiate phase 1/2 clinical trials in IDH2–mutation positive cancers in mid-2013. Our first clinical trial is being planned as a phase 1/2 trial in patients with advanced hematological malignancies that carry the IDH2 mutation and have correspondingly elevated 2HG levels. This multi-center, multiple ascending dose trial will primarily assess safety and tolerability for AG-221 in adults with AML or related diseases. Secondary endpoints will evaluate the pharmacokinetics and pharmacodynamics properties of AG-221 and determine if any efficacy signals can be measured. The initial

proof of mechanism will require the reduction of the metabolite 2HG in response to drug treatment. Multiple disease specific cohorts of 10-20 patients will be enrolled after a safe biologically active dose has been determined to evaluate the single-agent disease modifying activity of AG-221. We intend to conduct subsequent trials in patients with other cancers carrying the IDH2 mutation and in combination with other anti-cancer agents. We plan to pursue additional clinical studies, evaluating both single-agent as well as combination therapy in patients with serious and life-threatening hematological and solid tumors that harbor IDH2 mutation, in the most efficient manner as we seek to establish the safety and effectiveness of AG-221. The potential regulatory pathway (i.e., conventional or accelerated approval) will be determined by data emerging from the early development program.

AG-120: lead IDH1 program

AG-120 is an orally available, selective, potent inhibitor of the mutated IDH1 protein, making it a highly targeted therapeutic candidate for the treatment of patients with cancers that harbor IDH1 mutations. Importantly, mutations in IDH1 have been identified in difficult to treat cancers such as chondrosarcoma and cholangiocarcinoma where both the treatment options and prognosis for patients are poor. These are indications where the standard of care treatment options are limited, thus providing an opportunity for more rapid development of an IDH1 inhibitor. Based on our nonclinical *in vitro* and *in vivo* efficacy data, there is a clear rationale to develop AG-120 in defined target populations that harbor the IDH1 gene mutation.

AG-120 has completed exploratory safety studies in both rodents and primates, and has initiated manufacturing to allow for IND-enabling studies. We expect to initiate clinical trials in early 2014. Shortly thereafter, we plan to initiate multiple phase 1/2 clinical trials in both hematological and solid cancers. Our first clinical trial is being planned as a phase 1/2 trial in patients with advanced solid and hematological malignancies that carry the IDH1 mutation.

Other programs

In addition to our lead IDH2 and IDH1 programs, we are in earlier stages of validation and drug discovery on multiple novel programs. Our third cancer metabolism program targets the enzyme glutaminase, or GLS, which converts the nutrient glutamine into the metabolite glutamate. There appear to be multiple cancers that are dependent on this reaction for their survival and rely heavily on glutamine rather than glucose as a nutrient source. Our research has identified a means to identify the patients whose tumors are addicted to this nutrient source and the GLS enzyme. Drug discovery is currently in the late lead optimization stage, and we expect to initiate clinical trials in the second half of 2014. We also have a fourth validated program in drug discovery and currently have 10 targets in the early stages of validation.

Inborn errors of metabolism

Background

IEMs are a broad group of more than 600 orphan genetic diseases caused by mutations of single metabolic genes. In these disorders, the defect of a single metabolic enzyme disrupts the normal functioning of a metabolic pathway, leading to either aberrant accumulation of “upstream” metabolites which may be toxic or interfere with normal function or reduced ability to synthesize essential “downstream” metabolites or other critical cellular components. IEMs are also referred to as congenital metabolic diseases or rare genetic metabolic diseases.

The term inborn error of metabolism was coined by a British physician, Archibald Garrod (1857–1936), in the early 20th century. He is known for work that prefigured the “one gene-one enzyme” hypothesis, and his seminal text, Inborn Errors of Metabolism, was published in 1923. Traditionally, IEMs were categorized as disorders of carbohydrate metabolism, amino acid metabolism, organic acid metabolism, or lysosomal storage diseases. In recent decades, hundreds of new IEMs have been discovered and the categories have proliferated.

Most of these diseases are rare or ultra-rare orphan diseases, often with severe or life-threatening features. A disorder is considered orphan if it affects fewer than 200,000 people in the United States, or fewer than five per 10,000 people in the European Union. In a study in British Columbia, the overall incidence of IEMs was estimated to be 70 per 100,000 live births or one in 1,400 births, overall representing more than approximately 15% of single gene disorders in the population. Incidence of a single IEM can vary widely but is generally rare, usually equal to or less than one per 100,000 births. Many IEMs are likely to be under-diagnosed given the lack of available therapies or diagnostics and the rarity of the condition.

Current treatment options for these disorders are limited. Diet modification or nutrient supplementation can be beneficial in some IEMs. Several of these disorders, from a group known as lysosomal storage diseases, have been treated successfully with enzyme replacement therapy, or ERT, the therapeutic administration of a functional version of the defective enzyme. Examples of ERTs for lysosomal storage disorders include Fabrazyme ® for Fabry disease, Myozome® for Pompe disease, Cerezyme® for Gaucher disease, and Elaprase® for Hunter syndrome.

Unfortunately, most mutations driving IEMs are intracellular and not amenable for treatment with enzyme replacement therapies. As a result, despite the promising progress made for patients with a small group of these diseases, the vast majority of patients with IEMs have few therapeutic options available, and the standard of care is palliative, meaning treatment of symptoms with no effect on underlying disease mechanisms. We are taking a novel small molecule approach to correct the metabolic defects within diseased cells with a goal of developing transformative medicines for patients.

Pyruvate kinase deficiency program

Pyruvate kinase, or PK, is the enzyme involved in the second to last reaction in glycolysis—the conversion of glucose into lactic acid. This enzyme is critical for the survival of the cell and has several tissue-specific isoforms (PKR, PKL, PKM1 and PKM2). PKR is the isoform of pyruvate kinase which is present in red blood cells. Mutations in PKR cause defects in red cell glycolysis and leads to a hematological IEM known as pyruvate kinase deficiency, or PK deficiency. Glycolysis is the only pathway available for red blood cells to maintain the production of ATP, or Adenosine-5'-triphosphate, which transports chemical energy within cells for metabolism. Accordingly, total absence of the PKR gene is not compatible with life. PK deficiency leads to a shortened life-span for red blood cells and is the most common form of non-spherocytic hemolytic anemia in humans. The disease is autosomal recessive, meaning children inherit one mutated form of PKR from one parent and the second mutated form from the other parent. Children with the disease produce PKR enzyme that has only a fraction of the normal level of activity (generally <50%). Parents of affected children have only one copy of the mutated PKR enzyme and are clinically normal.

PK deficiency is a rare disorder and disease understanding is still evolving. Several published epidemiology studies estimated prevalence of PK deficiency between three to nine diagnosed patients per million. Agios estimates that between 1,000-3,000 diagnosed patients are alive in the U.S., with similar numbers in Europe, and we believe that the disease is likely under-diagnosed. There is no unique ethnic or geographic representation of the disease. The disease manifests by mild to severe forms of anemia caused by the excessive premature destruction of red blood cells. The precise mechanism for the destruction is not well understood but is thought to result from membrane instability secondary to the metabolic defect caused by the low level of PKR enzyme. The hemolysis is "extra-vascular" in that the red blood cells are destroyed in small capillaries or organs and not spontaneously breaking open in the circulation.

The disease typically presents during early infancy with jaundice and severe anemia, which can require immediate life-saving intervention via replacement of the infant's entire blood system with a donor's blood, referred to as an exchange transfusion. Children are classified as either severe disease (hemoglobin <8gm/dl and life long need for transfusions) or moderate (hemoglobin levels of 8-10 gm/dl and intermittent or rare transfusion support). Adults also fall into two similar categories: severe, which requires chronic transfusions, often monthly,

or moderate, which requires intermittent transfusions. Both moderate and severe patients may develop a severe hemolytic crisis in the face of infections or other "stressful" situations and face life-long anemia with an impact on the quality of life.

There is no treatment for this disease other than transfusion support and the disease is life-long. The true natural history and impact of life-long hemolysis is unknown. Chronic iron overload related to transfusions and possibly the disease itself can lead to life-threatening complications. Splenectomy, which refers to removal of the spleen, can modify the symptoms of the disease in some patients but has minimal impact on the ongoing hemolysis. Agios has commissioned and initiated a natural history study that will conduct a chart review of patients with the disorder and prospectively follow a select group.

AG-348: lead PKR program

Our development candidate AG-348 is an orally available, potent small molecule activator of PKR. Preclinical *in vitro* data demonstrate that these activators can significantly enhance both the activity and the stability of the majority of the common PKR mutants. This degree of enzyme activation leads to a meaningful correction of the metabolic imbalance normally found within mutant cells. Red blood cells have been obtained from patients with severe and moderate PK deficiency where *ex vivo* studies have demonstrated enzyme activation and metabolic improvement. AG-348 has completed exploratory safety studies in both rodents and primates, and we will be initiating manufacturing to allow for IND-enabling studies. We expect to start phase 1/2 clinical trials in patients with PK deficiency in 2014.

We believe the clinical and regulatory strategy for our PK deficiency program has well established primary and secondary endpoints similar to that of other approved medicines developed for the treatment of hemolytic anemia.

Type II D-2 hydroxyglutaric aciduria: IDH2 non-cancer indication

A germline mutation in IDH2, identical to that of cancer patients, has recently been discovered in patients with an ultra-rare, extremely debilitating, and uniformly fatal, genetic neurometabolic disorder called Type II D-2 hydroxyglutaric aciduria. Type II D-2-HGA patients develop a range of medical complications, including developmental delay, seizures, hypotonia, epilepsy, cardiomyopathy, and dysmorphic features. Few affected patients survive past their teens, with the majority dying from cardiac and/or central nervous system disease.

In addition to our planned cancer development program, we will potentially evaluate the use of AG-221 for Type II D-2 HGA. We have initiated collaborations with global metabolic clinical centers to further explore the prevalence and incidence of the disease. There have been potentially 50 reported cases globally, however there is uncertainty as to the number of patients, and we are conducting a natural history study in order to better determine the incidence of the disease. In addition we have created a genetically derived mouse model that appears to replicate the disease. This model should allow us to conduct profiling and efficacy studies with AG-221 and other IDH2 mutant specific compounds.

Other preclinical IEM programs

Our approach is to identify a series of IEMs which share the following common set of features:

- single gene defect;
- severe clinical presentation with evidence that disease damage is progressive but potentially reversible;
- adequate number of patients identified for prospective clinical trials; and
- an assessment of the target, based upon a detailed mutational, structural, and metabolomic analysis, to determine if a small molecule approach to correcting the disease is possible.

Based on the above criteria, we have started exploratory and early target validation for four programs.

Collaboration with Celgene

In April 2010, we entered into a Discovery and Development Collaboration and License Agreement with Celgene, focused on targeting cancer metabolism. The goal of the collaboration is to discover, develop and commercialize disease-altering therapies in oncology arising out of our cancer metabolism research platform that have achieved development candidate status on or before April 14, 2014. Celgene will have the option to extend such period through April 14, 2016. We refer to such four to six year period as the discovery phase of the collaboration. We are leading discovery, preclinical and early clinical development for all cancer metabolism programs under the collaboration. We have nominated two development candidates during the discovery phase and both development candidates have been confirmed by a joint research committee, or JRC, pursuant to the agreement—our IDH1 and IDH2 development candidates.

Discovery programs with development candidates. Celgene may elect to progress into preclinical development each discovery program for which we nominate and the JRC confirms a development candidate during the discovery phase. If Celgene makes such an election, we will, at our expense, conduct studies required to meet the requirements for filing an IND, or IND-enabling studies, and, following their successful completion as confirmed by the JRC, we will file an IND to commence clinical studies of such development candidate. If the FDA accepts the IND, Celgene may request that we conduct an initial phase 1 study at our expense, for which Celgene will pay us at least $5 million upon enrollment of the last patient in such study unless such program becomes a split licensed program, as described below.

Celgene may elect to convert each discovery program for which we have nominated a development candidate into a co-commercialized licensed program, the attributes of which are described below. We have the right, exercisable during a specified period following FDA acceptance of the applicable IND, to convert one of every three co-commercialized licensed programs into a split licensed program, for which we retain the United States rights, other attributes of which are further described below. Our IDH2 program will not be a split licensed program. We may elect to opt out of any split licensed program, after which such split licensed program will revert to a co-commercialized licensed program, and Celgene will have the right, but not the obligation, to commercialize medicines from such program in the United States.

We will retain our rights to the development candidate and certain other compounds from any discovery program for which we nominate and the JRC confirms a development candidate and that Celgene does not elect to progress into preclinical development or convert into a co-commercialized licensed program. In addition, if the JRC or Celgene elects not to continue collaboration activities with respect to a particular target, either we or Celgene would have the right independently to undertake a discovery program on such target and would have rights to specified compounds from such program, subject to certain "buy-in" rights granted to the other party.

Further development and commercialization of programs. The agreement provides for three types of licensed programs discussed above: co-commercialized licensed programs, split licensed programs, and buy-in programs. Celgene's and our rights and obligations under each licensed program vary depending on the type of licensed program, as described below.

- *Co-commercialized licensed programs*: Celgene will lead and, following either IND acceptance by the FDA or, if Celgene requests us to conduct the initial phase 1 study, completion of such study, will fund global development and commercialization of each co-commercialized licensed program. We have the right to participate in a portion of sales activities in the United States for medicines from co-commercialized programs in accordance with the applicable commercialization plan.
- *Split licensed programs*: Celgene will lead development and commercialization outside the United States, and we will lead development and commercialization in the United States, for each split licensed program. We and Celgene will equally fund the global development costs of each split licensed program that are not specific to any particular region or country, Celgene will be responsible for development and commercialization costs specific to countries outside the United States, and we will be responsible for development and commercialization costs specific to the United States.

- *Buy-in programs*: The party that was conducting an independent program that became a buy-in program will lead the development and commercialization of such program. The party that elects to buy in to such program will be responsible for funding a portion of development costs incurred after acceptance of an IND for a buy-in program compound, and the lead party will be responsible for all other development costs and all commercialization costs for medicines from such buy-in program.

In addition, Celgene may license certain discovery programs for which we did not nominate or the JRC did not confirm a development candidate during the discovery phase and for which Celgene will lead and fund global development and commercialization. We refer to these as picked licensed programs.

Collaboration governance. The collaboration is managed by a set of joint committees comprised of equal numbers of representatives from each of us and Celgene. The joint steering committee, or JSC, oversees and coordinates the overall conduct of the collaboration. The JRC oversees and coordinates discovery, research and preclinical activities with respect to each discovery program during the discovery phase. A joint development committee, or JDC, for each licensed program will oversee and coordinate development (including manufacturing of clinical supply) of medicines under such licensed program. The joint commercialization committee, or JCC, will oversee the commercialization (including manufacturing of commercial supply) of medicines under the licensed programs.

Diligence. We and Celgene each must use commercially reasonable efforts to perform all activities for which such party is responsible under the collaboration.

Exclusivity. During the discovery phase, we may not directly or indirectly develop, manufacture or commercialize, except pursuant to the agreement, any product or product candidate for any cancer indication with specified activity against certain metabolic targets (except in connection with certain specified third party collaborations), or with specified activity against any collaboration target (or any target for which Celgene is conducting an independent program that we elected not to buy in to) for any indication. Following the discovery phase until termination or expiration of the agreement, either in its entirety or with respect to the relevant program, we may not directly or indirectly develop, manufacture or commercialize, outside of the collaboration, any therapeutic modality with specified activity against any collaboration target that is within a licensed program or against any former collaboration target against which Celgene is conducting an independent program under the agreement. Pursuant to the terms of the first amendment to the agreement, we have the right to develop, manufacture and commercialize outside of the collaboration certain medicines directed against PKR for certain indications, including PK deficiency, subject to specified conditions, including a right of first negotiation that Celgene may exercise if we intend to license our PKR program to any third party.

Financial terms. Under the terms of the agreement, we received an upfront payment of approximately $121.2 million. In addition, Celgene purchased 5,190,551 shares of our series B convertible preferred stock at a price of $1.70 per share, resulting in net proceeds to us of approximately $8.8 million. Celgene made a payment to us of $20.0 million pursuant to an October 2011 amendment in consideration of extending the discovery phase until April 14, 2014.

We may be eligible to receive up to an additional $40.0 million in extension payments to extend the discovery phase until April 2016 and up to $120.0 million in potential milestone payments payable for each licensed program other than buy-in programs. The potential milestone payments under the agreement for such licensed program are comprised of: (i) a $25.0 million milestone payment upon achievement of a specified clinical development milestone event, (ii) up to $70.0 million in milestone payments upon achievement of specified regulatory milestone events, and (iii) a $25.0 million milestone payment upon achievement of a specified commercial milestone event (for co-commercialized and certain other licensed programs only). In addition, we are eligible to receive a payment of $22.5 million upon achievement of an early clinical development milestone event for certain co-commercialized licensed programs. We are also eligible to receive a one-time payment of $25.0 million upon dosing of the last patient in a phase 2 study for the first split licensed program.

We are eligible to receive royalties at tiered, low- to mid-teen percentage rates on Celgene's net sales of medicines from licensed programs. We are also eligible to receive royalties at a fixed, mid-single digit percentage rate on net sales of medicines from certain Celgene independent programs. We may be obligated to pay Celgene royalties at tiered, low- to mid-teen percentage rates on our net sales in the United States of medicines from split licensed programs and on net sales of medicines from buy-in programs for which we are the commercializing party.

Termination. Celgene may terminate the agreement for convenience in its entirety or with respect to one or more programs upon ninety days written notice to us. Either we or Celgene may terminate the agreement, in its entirety or with respect to one or more programs, if the other party is in material breach and fails to cure such breach within the specified cure period; however, if such breach relates solely to a specific program, the non-breaching party may terminate the agreement solely with respect to such program. Either we or Celgene may terminate the agreement in the event of specified insolvency events involving the other party.

If Celgene terminates the agreement as a result of our uncured material breach, then certain of our rights and certain of Celgene's obligations described above would change with respect to the terminated program(s), including, for example: the licenses we granted to Celgene would become perpetual; milestone payments to which we may be entitled may be reduced or eliminated; royalties to which we may be entitled may be reduced or eliminated; we would lose the development and commercialization rights for the United States for any terminated split licensed program; and we would grant Celgene specified rights, and take specified actions, to assist Celgene in continuing the development, manufacture and commercialization of medicines for the United States from each terminated split licensed program.

If Celgene terminates the agreement for convenience or if we terminate the agreement as a result of Celgene's uncured material breach, the licenses we granted to Celgene with respect to the terminated program(s) will end, and we will have specified rights for, and Celgene will take specified actions to assist us in continuing, the development, manufacture and commercialization of medicines from each terminated program.

Intellectual property

Our commercial success depends in part on our ability to obtain and maintain proprietary or intellectual property protection for our product candidates and our core technologies, including novel biomarker and diagnostic discoveries, and other know-how, to operate without infringing on the proprietary rights of others and to prevent others from infringing our proprietary or intellectual property rights. Our policy is to seek to protect our proprietary and intellectual property position by, among other methods, filing U.S., international 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 and continuing technological innovation to develop and maintain our proprietary and intellectual property position.

We file patent applications directed to our key product candidates in an effort to establish intellectual property positions regarding new chemical entities relating to these product candidates as well as uses of new chemical entities in the treatment of diseases. We also seek patent protection with respect to biomarkers that may be useful in selecting the right patient population for therapies with our product candidates. As of May 31, 2013, we had approximately 30 pending U.S. patent applications and approximately 120 pending foreign patent applications. Some of our pending patent applications are Patent Cooperation Treaty, or PCT, patent applications, filed under the Patent Cooperation Treaty, an international patent law treaty that provides a unified procedure for filing a single initial patent application to seek patent protection for an invention simultaneously in each of the 147 member states, followed by the process of entering into national phases in each of the member states, which requires a separate application in each of the member states when continued protection is sought.
A significant portion of our pending patent applications pertain to our key discovery programs. The technology underlying such pending patent applications has been developed by us and was not acquired from any in-licensing agreement. Any patents that may issue from these applications would expire between 2027 and 2034.

The intellectual property portfolios for our most advanced product candidates as of May 31, 2013 are summarized below.

Cancer metabolism

- *IDH2:* The intellectual property portfolio for our IDH2 program contains patent applications directed to compositions of matter for AG-221 and other chemical scaffolds as well as methods of making, referred to as synthetic methods, and methods of use. As of May 31, 2013, we owned two pending U.S. patent applications as well as corresponding pending foreign patent applications, and a pending PCT patent application that is eligible for entering into national phase in each of the PCT member states.

- *IDH1:* The intellectual property portfolio for our IDH1 program contains patent applications directed to compositions of matter for AG-120 and multiple chemical scaffolds as well as synthetic methods and methods of use. As of May 31, 2013, we owned five pending U.S. patent applications as well as corresponding foreign patent applications, and four pending PCT patent applications that are eligible for entering into national phase in each of the PCT member states.

- *GLS:* The intellectual property portfolio for our GLS program contains patent applications directed to compositions of matter for the lead series and other chemical scaffolds as well as synthetic methods and methods of use. As of May 31, 2013, we owned two pending U.S. patent applications and a pending PCT patent application that is eligible for entering into national phase in each of the PCT member states.

Inborn errors of metabolism

- *PKR*: The intellectual property portfolio for our PKR program contains patent applications directed to compositions of matter for AG-348 and multiple chemical scaffolds as well as synthetic methods and methods of use. As of May 31, 2013, we owned seven pending U.S. patent applications as well as their corresponding foreign patent applications, and seven pending PCT patent applications that are eligible for entering into national phase in each of the PCT member states.

In addition to the pending patent applications covering our most advanced product candidates, our portfolio also includes pending patent applications relating to diagnostic methods for detecting various IDH1 and IDH2 mutations and biomarkers useful for identifying patients suitable for therapies by GLS inhibitors, as well as compositions of matter and methods of use directed to modulating other metabolic targets.

The term of individual patents depends upon the legal term for patents in the countries in which they are obtained. In most countries, including the United States, the patent term is 20 years from the earliest filing date of a non-provisional patent application. In the United States, a patent's term may be lengthened by patent term adjustment, which compensates a patentee for administrative delays by the U.S. Patent and Trademark Office, or the USPTO, in examining and granting a patent, or may be shortened if a patent is terminally disclaimed over an earlier filed patent. The term of a patent that covers a drug or biological product may also be eligible for patent term extension when FDA approval is granted, provided statutory and regulatory requirements are met. See "—Government regulation—The Hatch-Waxman Act" below for additional information on such exclusivity. In the future, if and when our product candidates receive approval by the FDA or foreign regulatory authorities, we expect to apply for patent term extensions on issued patents covering those products, depending upon the length of the clinical trials for each medicine and other factors. There can be no assurance that any of our pending patent applications will issue or that we will benefit from any patent term extension or favorable adjustment to the term of any of our patents.

As with other biotechnology and pharmaceutical companies, our ability to maintain and solidify our proprietary and intellectual property position for our product candidates and technologies will depend on our success in obtaining effective patent claims and enforcing those claims if granted. However, patent applications that we may file or license from third parties may not result in the issuance of patents. We also cannot predict the breadth of claims that may be allowed or enforced in our patents. Any issued patents that we may receive in the future

may be challenged, invalidated or circumvented. For example, we cannot be certain of the priority of inventions covered by pending third-party patent applications. If third parties prepare and file patent applications in the United States that also claim technology or therapeutics to which we have rights, we may have to participate in interference proceedings in the USPTO to determine priority of invention, which could result in substantial costs to us, even if the eventual outcome is favorable to us. In addition, because of the extensive time required for clinical development and regulatory review of a product candidate we may develop, it is possible that, before any of our product candidates 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.

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 collaborators, scientific advisors, employees and consultants, and invention assignment agreements with our employees. We also have agreements requiring assignment of inventions with selected consultants, scientific advisors and collaborators. The confidentiality agreements are designed to protect our proprietary information and, in the case of agreements or clauses requiring invention assignment, to grant us ownership of technologies that are developed through a relationship with a third party.

With respect to our proprietary cellular metabolism technology platform, we consider trade secrets and know-how to be our primary intellectual property. Trade secrets and know-how can be difficult to protect. In particular, we anticipate that with respect to this technology platform, these trade secrets and know-how will over time be disseminated within the industry through independent development, the publication of journal articles describing the methodology, and the movement of personnel skilled in the art from academic to industry scientific positions.

Competition

The pharmaceutical and biotechnology industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary products. While we believe that our technology, development experience and scientific knowledge provide us with competitive advantages, we face potential competition from many different sources, including major pharmaceutical, specialty pharmaceutical and biotechnology companies, academic institutions and governmental agencies and public and private research institutions. Any product candidates that we successfully develop and commercialize will compete with existing therapies and new therapies that may become available in the future.

We compete in the segments of the pharmaceutical, biotechnology and other related markets that address cancer metabolism and IEMs. There are other companies working to develop therapies in the field of cancer metabolism and IEMs. These companies include divisions of large pharmaceutical companies and biotechnology companies of various sizes.

Cancer metabolism. In the field of cancer metabolism, our principal competitors include AstraZeneca, Calithera Biosciences, Cornerstone Pharmaceuticals, Eli Lilly, Forma Therapeutics, GlaxoSmithKline, Novartis, Pfizer, and Roche Holdings, and its subsidiary Genentech.

The most common methods of treating patients with cancer are surgery, radiation and drug therapy, including chemotherapy, hormone therapy and targeted drug therapy. There are a variety of available drug therapies marketed for cancer. In many cases, these drugs are administered in combination to enhance efficacy. While our product candidates may compete with many existing drug and other therapies, to the extent they are ultimately used in combination with or as an adjunct to these therapies, our product candidates will not be competitive with them. Some of the currently approved drug therapies are branded and subject to patent protection, and others are available on a generic basis. Many of these approved drugs are well established therapies and are widely accepted by physicians, patients and third-party payors. In general, although there has been considerable progress over the past few decades in the treatment of cancer and the currently marketed therapies provide benefits to many patients, these therapies all are limited to some extent in their efficacy and frequency of adverse events,

and none are successful in treating all patients. As a result, the level of morbidity and mortality from cancer remains high.

In addition to currently marketed therapies, there are also a number of medicines in late stage clinical development to treat cancer. These medicines in development may provide efficacy, safety, convenience and other benefits that are not provided by currently marketed therapies. As a result, they may provide significant competition for any of our product candidates for which we obtain market approval.

Inborn errors of metabolism. In the field of IEMs, our principal competitors include Alexion Pharmaceuticals, BioMarin Pharmaceutical, Genzyme, a Sanofi company, and Shire.

The most common methods for treating patients with IEMs are dietary restriction, dietary supplementation or replacement, treatment of symptoms and complications, gene therapy, organ transplant and enzyme replacement therapies. There are a number of marketed enzyme replacement therapies available for treating patients with IEMs. In some cases, these treatment methods are used in combination to improve efficacy. While our product candidates may compete with existing medicines and other therapies, to the extent they are ultimately used in combination with or as an adjunct to these therapies, our product candidates will not be competitive with them. In addition to currently marketed therapies, there are also a number of products that are either enzyme replacement therapies or gene therapies in various stages of clinical development to treat IEMs. These products in development may provide efficacy, safety, convenience and other benefits that are not provided by currently marketed therapies. As a result, they may provide significant competition for any of our product candidates for which we obtain market approval.

Many of our competitors may have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved medicines than we do. Mergers and acquisitions in the pharmaceutical, biotechnology and diagnostic industries may result in even more resources being concentrated among a smaller number of our competitors. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs. Smaller or early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies.

The key competitive factors affecting the success of all of our product candidates, if approved, are likely to be their efficacy, safety, convenience, price, the effectiveness of assays or tests to identify an appropriate patient population, which we refer to as companion diagnostics, in guiding the use of related therapeutics, the level of generic competition and the availability of reimbursement from government and other third-party payors.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize medicines that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any medicines that we may develop. Our competitors also may obtain FDA or other regulatory approval for their medicines more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market. In addition, our ability to compete may be affected in many cases by insurers or other third-party payors seeking to encourage the use of generic medicines. There are many generic medicines currently on the market for the indications that we are pursuing, and additional medicines are expected to become available on a generic basis over the coming years. If our therapeutic product candidates are approved, we expect that they will be priced at a significant premium over competitive generic medicines.

Manufacturing

We do not own or operate, and currently have no plans to establish, any manufacturing facilities. We currently rely, and expect to continue to rely, on third parties for the manufacture of our product candidates for preclinical

and clinical testing, as well as for commercial manufacture of any products that we may commercialize. To date, we have obtained materials for AG-221 for our planned phase 1/2 testing from third party manufacturers. We have engaged third party manufacturers to obtain the active ingredient for AG-120 for preclinical and clinical testing. We obtain our supplies from these manufacturers on a purchase order basis and do not have a long-term supply arrangement in place. We do not currently have arrangements in place for redundant supply for bulk drug substance. For all of our product candidates, we intend to identify and qualify additional manufacturers to provide the active pharmaceutical ingredient and fill-and-finish services prior to submission of a new drug application to the FDA.

AG-221, AG-120 and AG-348 are organic compounds of low molecular weight, generally called small molecules. They can be manufactured in reliable and reproducible synthetic processes from readily available starting materials. The chemistry is amenable to scale-up and does not require unusual equipment in the manufacturing process. We expect to continue to develop drug candidates that can be produced cost-effectively at contract manufacturing facilities.

We generally expect to rely on third parties for the manufacture of any companion diagnostics we develop.

Government regulation

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

United States drug approval process

In the United States, the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act, or FDCA, and implementing regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations requires the expenditure of substantial time and financial resources. Failure to comply with the applicable United States requirements at any time during the product development process, approval process or after approval, may subject an applicant to a variety of administrative or judicial sanctions, such as the FDA's refusal to approve pending applications, withdrawal of an approval, imposition of a clinical hold, issuance of warning letters and untitled letters, product recalls, product seizures, total or partial suspension of production or distribution injunctions, fines, refusals of government contracts, restitution, disgorgement of profits or civil or criminal penalties.

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

- completion of preclinical laboratory tests, animal studies and formulation studies in compliance with the FDA's good laboratory practice, or GLP, regulations;
- submission to the FDA of an IND, which must become effective before human clinical trials may begin;
- approval by an independent institutional review board, or IRB, at each clinical site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with good clinical practices, or GCP, to establish the safety and efficacy of the proposed drug for each indication;
- submission to the FDA of a new drug application, or NDA;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the product is produced to assess compliance with current good manufacturing practices, or cGMP, requirements and to

assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity; and

- FDA review and approval of the NDA.

Preclinical studies and IND

Preclinical studies include laboratory evaluation of product chemistry and formulation, as well as *in vitro* and animal studies to assess the potential for adverse events and in some cases to establish a rationale for therapeutic use. The conduct of preclinical studies is subject to federal regulations and requirements, including GLP regulations for safety/toxicology studies. An IND sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical studies, among other things, to the FDA as part of an IND. Some long-term preclinical testing, such as animal tests of reproductive adverse events and carcinogenicity, may continue after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to one or more proposed clinical trials and places the trial on clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

Clinical trials

Clinical trials involve the administration of the investigational new drug to human subjects under the supervision of qualified investigators in accordance with GCP requirements, which include, among other things, the requirement that all research subjects provide their informed consent in writing before their participation in any clinical trial. Clinical trials are conducted under written study protocols detailing, among other things, the objectives of the study, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A protocol for each clinical trial and any subsequent protocol amendments must be submitted to the FDA as part of the IND. In addition, an IRB at each institution participating in the clinical trial must review and approve the plan for any clinical trial before it commences at that institution, and the IRB must conduct continuing review. The IRB must review and approve, among other things, the study protocol and informed consent information to be provided to study subjects. An IRB must operate in compliance with FDA regulations. Information about certain clinical trials must be submitted within specific timeframes to the National Institutes of Health for public dissemination at www.clinicaltrials.gov.

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

- *Phase 1:* The drug is initially introduced into healthy human subjects or patients with the target disease or condition and tested for safety, dosage tolerance, absorption, metabolism, distribution, excretion and, if possible, to gain an early indication of its effectiveness.
- *Phase 2:* The drug is administered to a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance and optimal dosage.
- *Phase 3:* The drug is administered to an expanded patient population in adequate and well-controlled clinical trials to generate sufficient data to statistically confirm the efficacy and safety of the product for approval, to establish the overall risk-benefit profile of the product and to provide adequate information for the labeling of the product.

Progress reports detailing the results of the clinical trials must be submitted at least annually to the FDA and, more frequently, if serious adverse events occur. Phase 1, phase 2 and phase 3 clinical trials may not be completed successfully within any specified period, or at all. Furthermore, the FDA or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects 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 has been associated with unexpected serious harm to patients.

Marketing approval

Assuming successful completion of the required clinical testing, the results of the preclinical and clinical studies, together with detailed information relating to the product's chemistry, manufacture, controls and proposed labeling, among other things, are submitted to the FDA as part of an NDA requesting approval to market the product for one or more indications. Under federal law, the submission of most NDAs is additionally subject to a substantial application user fee, currently exceeding $1.8 million, and the sponsor of an approved NDA is also subject to annual product and establishment user fees, currently exceeding $98,000 per product and $520,000 per establishment. These fees are typically increased annually.

The FDA conducts a preliminary review of all NDAs within the first 60 days after submission before accepting them for filing to determine whether they are sufficiently complete to permit substantive review. The FDA may request additional information rather than accept an NDA for filing. In this event, the application must be resubmitted with the additional information. The resubmitted application is also subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth substantive review. The FDA has agreed to specified performance goals in the review of NDAs. Under these goals, the FDA has committed to review most such applications for non-priority products within 10 months, and most applications for priority review products, that is, drugs that the FDA determines represent a significant improvement over existing therapy, within six months. The review process may be extended by the FDA for three additional months to consider certain information or clarification regarding information already provided in the submission. The FDA may also refer applications for novel drugs or products that present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Before approving an NDA, the FDA typically will inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. In addition, before approving an NDA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP and integrity of the clinical data submitted.

The testing and approval process requires substantial time, effort and financial resources, and each may take many years to complete. Data obtained from clinical activities are not always conclusive and may be susceptible to varying interpretations, which could delay, limit or prevent regulatory approval. The FDA may not grant approval on a timely basis, or at all. We may encounter difficulties or unanticipated costs in our efforts to develop our product candidates and secure necessary governmental approvals, which could delay or preclude us from marketing our products.

After the FDA's evaluation of the NDA and inspection of the manufacturing facilities, the FDA may issue an approval letter or a complete response letter. An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. A complete response letter generally outlines the deficiencies in the submission and may require substantial additional testing or information in order for the FDA to reconsider the application. If and when those deficiencies have been addressed to the FDA's satisfaction in a resubmission of the NDA, the FDA will issue an approval letter. The FDA has committed to reviewing such resubmissions in two or six months depending on the type of information included. Even with submission of this additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval and refuse to approve the NDA. Even if the FDA approves a product, it may limit the approved indications for use for the product, require that contraindications, warnings or precautions be included in the

product labeling, require that post-approval studies, including phase 4 clinical trials, be conducted to further assess a drug's safety after approval, require testing and surveillance programs to monitor the product after commercialization, or impose other conditions, including distribution restrictions or other risk management mechanisms, including Risk Evaluation and Mitigation Strategies, or REMs, which can materially affect the potential market and profitability of the product. The FDA may prevent or limit further marketing of a product based on the results of post-market studies or surveillance programs. After approval, some types of changes to the approved product, such as adding new indications, manufacturing changes and additional labeling claims, are subject to further testing requirements and FDA review and approval.

Fast track designation

The FDA is required to facilitate the development and expedite the review of drugs that are intended for the treatment of a serious or life-threatening condition for which there is no effective treatment and which demonstrate the potential to address unmet medical needs for the condition. Under the fast track program, the sponsor of a new drug candidate may request the FDA to designate the product for a specific indication as a fast track product concurrent with or after the filing of the IND for the product candidate. The FDA must determine if the product candidate qualifies for fast track designation within 60 days after receipt of the sponsor's request.

In addition to other benefits, such as the ability to use surrogate endpoints and have greater interactions with the FDA, the FDA may initiate review of sections of a fast track product's NDA before the application is complete. This rolling review is available if the applicant provides and the FDA approves a schedule for the submission of the remaining information and the applicant pays applicable user fees. However, the FDA's time period goal for reviewing a fast track application does not begin until the last section of the NDA is submitted. In addition, the fast track designation may be withdrawn by the FDA if the FDA believes that the designation is no longer supported by data emerging in the clinical trial process.

Priority review

Under FDA policies, a product candidate may be eligible for priority review, or review generally within a six-month time frame from the time a complete application is received. Products regulated by the FDA's Center for Drug Evaluation and Research, or CDER, are eligible for priority review if they provide a significant improvement compared to marketed products in the treatment, diagnosis or prevention of a disease. A fast track designated product candidate would ordinarily meet the FDA's criteria for priority review.

Accelerated approval

Under the FDA's accelerated approval regulations, the FDA may approve a drug for a serious or life-threatening illness that provides meaningful therapeutic benefit to patients over existing treatments based upon a surrogate endpoint that is reasonably likely to predict clinical benefit. In clinical trials, a surrogate endpoint is a measurement of laboratory or clinical signs of a disease or condition that substitutes for a direct measurement of how a patient feels, functions or survives. Surrogate endpoints can often be measured more easily or more rapidly than clinical endpoints. A product candidate approved on this basis is subject to rigorous post-marketing compliance requirements, including the completion of phase 4 or post-approval clinical trials to confirm the effect on the clinical endpoint. Failure to conduct required post-approval studies, or confirm a clinical benefit during post-marketing studies, would allow the FDA to withdraw the drug from the market on an expedited basis. All promotional materials for drug candidates approved under accelerated regulations are subject to prior review by the FDA.

Breakthrough therapy designation

Under the provisions of the new Food and Drug Administration Safety and Innovation Act, or FDASIA, enacted in 2012, a sponsor can request designation of a product candidate as a "breakthrough therapy." A breakthrough

therapy is defined as a drug that is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. Drugs designated as breakthrough therapies are also eligible for accelerated approval. The FDA must take certain actions, such as holding timely meetings and providing advice, intended to expedite the development and review of an application for approval of a breakthrough therapy. Even if a product qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

Orphan drugs

Under the Orphan Drug Act, the FDA may grant orphan drug designation to drugs intended to treat a rare disease or condition, which is generally defined as a disease or condition that affects fewer than 200,000 individuals in the United States. Orphan drug designation must be requested before submitting an NDA. After the FDA grants orphan drug designation, the generic identity of the drug and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process. The first NDA applicant to receive FDA approval for a particular active ingredient to treat a particular disease with FDA orphan drug designation is entitled to a seven-year exclusive marketing period in the United States for that product, for that indication. During the seven-year exclusivity period, the FDA may not approve any other applications to market the same drug for the same orphan indication, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity in that it is shown to be safer, more effective or makes a major contribution to patient care. Orphan drug exclusivity does not prevent the FDA from approving a different drug for the same disease or condition, or the same drug for a different disease or condition. Among the other benefits of orphan drug designation are tax credits for certain research and a waiver of the NDA application user fee.

Pediatric information

Under the Pediatric Research Equity Act of 2003, as amended and reauthorized by the Food and Drug Administration Amendments Act of 2007, or the FDAAA, an NDA or supplement to an NDA must contain data that are adequate to assess the safety and effectiveness of the drug for the claimed indications in all relevant pediatric subpopulations, and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The FDA may, on its own initiative or at the request of the applicant, grant deferrals for submission of some or all pediatric data until after approval of the product for use in adults, or full or partial waivers from the pediatric data requirements. Unless otherwise required by regulation, the pediatric data requirements do not apply to products with orphan drug designation.

Combination products

The FDA regulates combinations of products that cross FDA centers, such as drug, biologic or medical device components that are physically, chemically or otherwise combined into a single entity, as a combination product. The FDA center with primary jurisdiction for the combination product will take the lead in the premarket review of the product, with the other center consulting or collaborating with the lead center.

The FDA's Office of Combination Products, or OCP, determines which center will have primary jurisdiction for the combination product based on the combination product's "primary mode of action." A mode of action is the means by which a product achieves an intended therapeutic effect or action. The primary mode of action is the mode of action that provides the most important therapeutic action of the combination product, or the mode of action expected to make the greatest contribution to the overall intended therapeutic effects of the combination product.

Often it is difficult for the OCP to determine with reasonable certainty the most important therapeutic action of the combination product. In those difficult cases, the OCP will consider consistency with other combination

products raising similar types of safety and effectiveness questions, or which center has the most expertise to evaluate the most significant safety and effectiveness questions raised by the combination product.

A sponsor may use a voluntary formal process, known as a Request for Designation, when the product classification is unclear or in dispute, to obtain a binding decision as to which center will regulate the combination product. If the sponsor objects to that decision, it may request that the agency reconsider that decision.

Overview of FDA regulation of companion diagnostics

We may seek to develop in *vitro* and *in vivo* companion diagnostics for use in selecting the patients that we believe will respond to our therapeutics.

FDA officials have issued draft guidance that, when finalized, would address issues critical to developing *in vitro* companion diagnostics, such as biomarker qualification, establishing clinical validity, the use of retrospective data, the appropriate patient population and when the FDA will require that the device and the drug be approved simultaneously. The draft guidance issued in July 2011 states that if safe and effective use of a therapeutic product depends on an *in vitro* diagnostic, then the FDA generally will require approval or clearance of the diagnostic at the same time that the FDA approves the therapeutic product. The FDA has yet to issue further guidance, and it is unclear whether it will do so, or what the scope would be.

The FDA previously has required *in vitro* companion diagnostics intended to select the patients who will respond to the cancer treatment to obtain Pre-Market Approval, or PMA, simultaneously with approval of the drug.

PMA approval pathway

A medical device, including an *in vitro* diagnostic, or IVD, to be commercially distributed in the United States must receive either 510(k) clearance or PMA approval from the FDA prior to marketing. Devices deemed by the FDA to pose the greatest risk, such as life-sustaining, life supporting or implantable devices, or devices deemed not substantially equivalent to a previously 510(k) cleared device or a pre-amendment class III device for which PMA applications have not been called, are placed in Class III requiring PMA approval. The PMA approval pathway requires proof of the safety and effectiveness of the device to the FDA's satisfaction.

The PMA approval pathway generally takes from one to three years or even longer from submission of the application.

A PMA application for an IVD must provide extensive preclinical and clinical trial data. Preclinical data for an IVD includes many different tests, including how reproducible the results are when the same sample is tested multiple times by multiple users at multiple laboratories. The clinical data need to establish that the test is sufficiently safe, effective and reliable in the intended use population. In addition, the FDA must be convinced that a device has clinical utility, meaning that an IVD provides information that is clinically meaningful. A biomarker's clinical significance may be obvious, or the applicant may be able to rely upon published literature or submit data to show clinical utility.

A PMA application also must provide information about the device and its components regarding, among other things, device design, manufacturing and labeling. The sponsor must pay an application fee.

As part of the PMA review, the FDA will typically inspect the manufacturer's facilities for compliance with Quality System Regulation, or QSR, requirements, which impose elaborate testing, control, documentation and other quality assurance procedures.

Upon submission, the FDA determines if the PMA application is sufficiently complete to permit a substantive review, and, if so, the FDA accepts the application for filing. The FDA then commences an in-depth review of

the PMA application. The entire process typically takes one to three years, but may take longer. The review time is often significantly extended as a result of the FDA asking for more information or clarification of information already provided. The FDA also may respond with a not approvable determination based on deficiencies in the application and require additional clinical trials that are often expensive and time-consuming and can substantially delay approval.

During the review period, an FDA advisory committee, typically a panel of clinicians, may be convened to review the application and recommend to the FDA whether, or upon what conditions, the device should be approved. Although the FDA is not bound by the advisory panel decision, the panel's recommendation is important to the FDA's overall decision making process.

If the FDA's evaluation of the PMA application is favorable, the FDA typically issues an approvable letter requiring the applicant's agreement to specific conditions, such as changes in labeling, or specific additional information, such as submission of final labeling, in order to secure final approval of the PMA. If the FDA concludes that the applicable criteria have been met, the FDA will issue a PMA for the approved indications, which can be more limited than those originally sought by the manufacturer. The PMA can include post-approval conditions that the FDA believes necessary to ensure the safety and effectiveness of the device, including, among other things, restrictions on labeling, promotion, sale and distribution. Failure to comply with the conditions of approval can result in material adverse enforcement action, including the loss or withdrawal of the approval.

Even after approval of a PMA, a new PMA or PMA supplement may be required in the event of a modification to the device, its labeling or its manufacturing process. Supplements to a PMA often require the submission of the same type of information required for an original PMA, except that the supplement is generally limited to the information needed to support the proposed change from the product covered by the original PMA.

Clinical trials

A clinical trial is almost always required to support a PMA application. In some cases, one or more smaller Investigational Device Exemption, or IDE, studies may precede a pivotal clinical trial intended to demonstrate the safety and efficacy of the investigational device.

All clinical studies of investigational devices must be conducted in compliance with the FDA's requirements. If an investigational device could pose a significant risk to patients pursuant to FDA regulations, the FDA must approve an IDE application prior to initiation of investigational use. IVD trials usually do not require an IDE, as the FDA does not judge them to be a significant risk because the results do not affect the patients in the study. However, for a trial where the IVD result directs the therapeutic care of patients with cancer, we believe that the FDA would consider the investigation to present significant risk.

An IDE application must be supported by appropriate data, such as laboratory test results, showing that it is safe to test the device in humans and that the testing protocol is scientifically sound. The FDA typically grants IDE approval for a specified number of patients. A non-significant risk device does not require FDA approval of an IDE. Both significant risk and non-significant risk investigational devices require approval from IRBs at the study centers where the device will be used.

During the trial, the sponsor must comply with the FDA's IDE requirements for investigator selection, trial monitoring, reporting and record keeping. The investigators must obtain patient informed consent, rigorously follow the investigational plan and study protocol, control the disposition of investigational devices and comply with all reporting and record keeping requirements. Prior to granting PMA approval, the FDA typically inspects the records relating to the conduct of the study and the clinical data supporting the PMA application for compliance with applicable requirements.

Although the QSR does not fully apply to investigational devices, the requirement for controls on design and development does apply. The sponsor also must manufacture the investigational device in conformity with the quality controls described in the IDE application and any conditions of IDE approval that the FDA may impose with respect to manufacturing.

Post-market

After a device is on the market, numerous regulatory requirements apply. These requirements include: the QSR, labeling regulations, the FDA's general prohibition against promoting products for unapproved or "off label" uses, the Medical Device Reporting regulation, which requires that manufacturers report to the FDA if their device may have caused or contributed to a death or serious injury or malfunctioned in a way that would likely cause or contribute to a death or serious injury if it were to recur, and the Reports of Corrections and Removals regulation, which requires manufacturers to report recalls and field actions to the FDA if initiated to reduce a risk to health posed by the device or to remedy a violation of the FDCA.

The FDA enforces these requirements by inspection and market surveillance. If the FDA finds a violation, it can institute a wide variety of enforcement actions, ranging from a public warning letter to more severe sanctions such as: fines, injunctions and civil penalties; recall or seizure of products; operating restrictions, partial suspension or total shutdown of production; refusing requests for PMA approval of new products; withdrawing PMA approvals already granted; and criminal prosecution.

Other regulatory requirements

Any drug manufactured or distributed by us pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to recordkeeping, periodic reporting, product sampling and distribution, advertising and promotion and reporting of adverse experiences with the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims are subject to prior FDA review and approval.

The FDA may impose a number of post-approval requirements, including REMs, as a condition of approval of an NDA. For example, the FDA may require post-marketing testing, including phase 4 clinical trials, and surveillance to further assess and monitor the product's safety and effectiveness after commercialization. Regulatory approval of oncology products often requires that patients in clinical trials be followed for long periods to determine the overall survival benefit of the drug.

In addition, drug manufacturers and other entities involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and state agencies, and are subject to periodic unannounced inspections by the FDA and these state agencies for compliance with cGMP requirements. Changes to the manufacturing process are strictly regulated and often require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting and documentation requirements upon us and any third-party manufacturers that we may decide to use. Accordingly, manufacturers must continue to expend time, money and effort in the areas of production and quality control to maintain cGMP compliance.

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

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;

- fines, warning letters or holds on post-approval clinical trials;
- refusal of the FDA to approve pending applications or supplements to approved applications, or suspension or revocation of product license approvals;
- product seizure or detention, or refusal to permit the import or export of products; or
- consent decrees, injunctions or the imposition of civil or criminal penalties.

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

Additional provisions

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 statutes 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 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 the one hand and prescribers, purchasers and formulary managers on the other. Violations of the anti-kickback statute are punishable by imprisonment, criminal fines, civil monetary penalties and exclusion from participation in federal healthcare programs. Although there are a number of statutory exemptions and regulatory safe harbors protecting certain common activities from prosecution or other regulatory sanctions, the exemptions and safe harbors are drawn narrowly, and practices that involve remuneration intended to induce prescribing, purchases or recommendations may be subject to scrutiny if they do not qualify for an exemption or safe harbor.

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 to have a false claim paid. Recently, several pharmaceutical and other healthcare companies have been prosecuted under these laws for allegedly inflating drug prices they report to pricing services, which in turn were used by the government to set Medicare and Medicaid reimbursement rates, and for allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product. In addition, certain marketing practices, including off-label promotion, may also violate false claims laws. The majority of states also have statutes or regulations similar to the federal anti-kickback law and false claims laws, which apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor.

Physician drug samples

As part of the sales and marketing process, pharmaceutical companies frequently provide samples of approved drugs to physicians. The Prescription Drug Marketing Act, or the PDMA, imposes requirements and limitations upon the provision of drug samples to physicians, as well as prohibits states from licensing distributors of prescription drugs unless the state licensing program meets certain federal guidelines that include minimum standards for storage, handling and record keeping. In addition, the PDMA sets forth civil and criminal penalties for violations.

Foreign regulation

In order to market any product outside of the United States, we would need to comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy and governing, among other

things, clinical trials, marketing authorization, commercial sales and distribution of our products. Whether or not we obtain FDA approval for a product, we would need to obtain the necessary approvals by the comparable regulatory authorities of foreign countries before we can commence clinical trials or marketing of the product in those countries. The approval process varies from country to country and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries might differ from and be longer than that required to obtain FDA approval. Regulatory approval in one country does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country may negatively impact the regulatory process in others.

New legislation and regulations

From time to time, legislation is drafted, introduced and passed in Congress that could significantly change the statutory provisions governing the testing, approval, manufacturing and marketing of products regulated by the FDA. In addition to new legislation, FDA regulations and policies are often revised or interpreted by the agency in ways that may significantly affect our business and our products. It is impossible to predict whether further legislative changes will be enacted or whether FDA regulations, guidance, policies or interpretations changed or what the effect of such changes, if any, may be.

Pharmaceutical coverage, pricing and reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any drug products for which we obtain regulatory approval. Sales of any of our product candidates, if approved, will depend, in part, on the extent to which the costs of the products will be covered by third-party payors, including government health programs such as Medicare and Medicaid, commercial health insurers and managed care organizations. The process for determining whether a payor will provide coverage for a drug product may be separate from the process for setting the price or reimbursement rate that the payor will pay for the drug product once coverage is approved. Third-party payors may limit coverage to specific drug products on an approved list, or formulary, which might not include all of the approved drugs for a particular indication.

In order to secure coverage and reimbursement for any product that might be approved for sale, we may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of the product, in addition to the costs required to obtain FDA or other comparable regulatory approvals. Our product candidates may not be considered medically necessary or cost-effective. A payor's decision to provide coverage for a drug product does not imply that an adequate reimbursement rate will be approved. Third-party reimbursement may not be sufficient to enable us to maintain price levels high enough to realize an appropriate return on our investment in product development.

The containment of healthcare costs has become a priority of federal, state and foreign governments, and the prices of drugs have been a focus in this effort. Third-party payors are increasingly challenging the prices charged for medical products and services and examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy. If these third-party payors do not consider our products to be cost-effective compared to other available therapies, they may not cover our products after approval 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 at a profit. The U.S. government, state legislatures and foreign governments have shown significant interest in implementing cost containment programs to limit the growth of government-paid health care costs, including price controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs. Adoption of such controls and measures, and tightening of restrictive policies in jurisdictions with existing controls and measures, could limit payments for pharmaceuticals such as the drug candidates that we are developing and could adversely affect our net revenue and results.

Pricing and reimbursement schemes vary widely from country to country. Some countries provide that drug products may be marketed only after a reimbursement price has been agreed. Some countries may require the completion of additional studies that compare the cost-effectiveness of a particular product candidate to currently

available therapies. For example, the European Union provides options for its member states to restrict the range of drug products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. European Union member states may approve a specific price for a drug product or may instead adopt a system of direct or indirect controls on the profitability of the company placing the drug product on the market. Other member states allow companies to fix their own prices for drug products, but monitor and control company profits. The downward pressure on health care costs in general, particularly prescription drugs, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross-border imports from low-priced markets exert competitive pressure that may reduce pricing within a country. There can be no assurance that any country that has price controls or reimbursement limitations for drug products will allow favorable reimbursement and pricing arrangements for any of our products.

The marketability of any products for which we receive regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement. In addition, an increasing emphasis on managed care in the United States has increased and we expect will continue to increase the pressure on drug pricing. Coverage policies, third-party reimbursement rates and drug pricing regulation may change at any time. In particular, the Patient Protection and Affordable Care Act was enacted in the United States in March 2010 and contain provisions that may reduce the profitability of drug products, including, for example, increased rebates for drugs sold to Medicaid programs, extension of Medicaid rebates to Medicaid managed care plans, mandatory discounts for certain Medicare Part D beneficiaries and annual fees based on pharmaceutical companies' share of sales to federal health care programs. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

Our scientific founders and advisors

Founders

The founders of Agios are eminent scientists and authorities in cancer who have pioneered key advances in the field of cancer metabolism. Together, they provide scientific leadership and expertise in this field.

Lewis C. Cantley, Ph.D. Dr. Cantley is director of the Cancer Center at Weill Cornell Medical College and New York-Presbyterian Hospital and a member of the National Academy of Sciences and American Academy of Arts and Sciences. Dr. Cantley is a foremost expert in understanding the biochemical pathways linking cancer and energy metabolism. His key contributions include:

- discovering the phosphatidylinositol-3-kinase (PI3K) signaling pathway;
- characterizing the mechanism by which PI3K is activated by growth factors and oncogenes and elucidating pathways downstream of PI3K, including the AKT/PKB signaling pathway;
- pioneering the application of fluorescence resonance energy transfer (FRET) for studying small molecule cell membrane transport; and
- discovering pyruvate kinase M2 (PKM2) as a "hub" to integrate growth factor signaling and aerobic glycolysis, an evolution in the understanding of the Warburg effect.

Tak W. Mak, Ph.D. Dr. Mak is professor of medical biophysics, University of Toronto; director of the Advanced Medical Discovery Institute; director of the Campbell Family Institute for Breast Cancer Research; foreign associate of the National Academy of Sciences; and fellow of the Royal Society. Dr. Mak is a preeminent researcher of the biology of the immune system, the biology of apoptosis and the pathogenesis of cancer. His key contributions include:

- discovering the T-Cell receptor;
- characterizing the tumorigenic functions of the tumor suppressor protein p53 and the kinase Chk2;

- identifying CPT1C as a tumor-specific gene product that plays an important role in the utilization of fatty acids as an alternative energy source of cancer cells; and
- discovery of the function of CTLA-4.

Craig B. Thompson, M.D. Dr. Thompson is president and CEO of Memorial Sloan-Kettering Cancer Center; and a member of the National Academy of Sciences, American Academy of Arts and Sciences and Institute of Medicine. Dr. Thompson is an authority in the study of how genes regulate apoptosis and metabolism and investigates their application in treating cancer. His key contributions include:

- elucidating the role of the Bcl-2 family of oncogenes in regulating cell survival;
- identifying the roles of aerobic glycolysis, fatty acid synthesis and autophagy in the metabolic adaptation by cancer cells as part of carcinogenesis; and
- proposing the concept that most oncogenes and tumor suppressors evolved to regulate cellular metabolism.

Scientific advisors

We have assembled a world-class scientific advisory board that includes renowned experts in cancer metabolism, oncology, drug discovery and translational medicine. These advisors work in close collaboration with our scientists to identify new research directions and accelerate our target validation and drug discovery programs.

Name	Primary affiliation
Craig B. Thompson, M.D.	Memorial Sloan-Kettering Cancer Center
Joan Brugge, Ph.D.	Harvard Medical School
Lewis C. Cantley, Ph.D.	The Cancer Center at Weill Cornell Medical College and New York-Presbyterian Hospital
Jeffrey Engelman, M.D., Ph.D.	Massachusetts General Hospital and Harvard Medical School
William G. Kaelin, Jr., M.D.	Dana-Farber Cancer Institute and Harvard Medical School
Tak W. Mak, Ph.D.	University of Toronto and the Campbell Family Institute for Breast Cancer Research
Pier Paolo Pandolfi, M.D., Ph.D.	Beth Israel Deaconess Medical Center
David M. Sabatini, M.D., Ph.D.	Whitehead Institute and Massachusetts Institute of Technology
Charles Sawyers, M.D.	Memorial Sloan-Kettering Cancer Center
Matthew Vander Heiden, M.D., Ph.D.	Koch Institute for Integrative Cancer Research at MIT

Employees

As of May 31, 2013, we had 85 full-time employees, including 42 employees with M.D. or Ph.D. degrees. Of these full-time employees, 65 employees are engaged in research and development activities. None of our employees is represented by a labor union or covered by a collective bargaining agreement. We consider our relationship with our employees to be good.

Facilities

We occupy approximately 38,500 rentable square feet of office and laboratory space in Cambridge, Massachusetts under a lease that expires in April 2016. We believe that our facility is sufficient to meet our current needs and that suitable additional space will be available as and when needed.

Legal proceedings

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

Management

Executive officers and directors

The following table sets forth the name, age and position of each of our executive officers and directors as of as of May 31, 2013.

Name	Age	Position
Executive Officers		
David P. Schenkein, M.D.	56	Chief Executive Officer and Director
Duncan Higgons	58	Chief Operating Officer
Scott Biller, Ph.D.	57	Chief Scientific Officer
Glenn Goddard	42	Vice President, Finance
Key Employees		
Shin-San Michael Su, Ph.D.	57	Senior Vice President, Research & Development
Directors		
Lewis C. Cantley, Ph.D.(3)	64	Director
Douglas G. Cole, M.D.(1)(3)	53	Director
Perry Karsen	58	Director
John M. Maraganore, Ph.D.(1)(2)	50	Director
Robert T. Nelsen(2)	50	Director
Kevin P. Starr(1)(3)	50	Director
Marc Tessier-Lavigne, Ph.D.(2)	53	Director

(1) Member of the audit committee.
(2) Member of the compensation committee.
(3) Member of the nominating and corporate governance committee.

David P. Schenkein, M.D. joined Agios in August 2009 as chief executive officer and a member of our board of directors and has been a hematologist and medical oncologist for more than 20 years. He currently serves as an adjunct attending physician in hematology at Tufts Medical Center and is a member of the board of directors of the Biotechnology Industry Organization, the world's largest biotechnology trade association, a position he has held since 2012. Prior to joining Agios, from March 2006 to July 2009, Dr. Schenkein was the senior vice president, clinical hematology/oncology at Genentech, Inc., a pharmaceutical company, where he was responsible for numerous successful oncology drug approvals and leading the medical and scientific strategies for its BioOncology portfolio. While at Genentech, he served as an adjunct clinical professor of medical oncology at Stanford University School of Medicine. Prior to joining Genentech, he served as the senior vice president of clinical research at Millennium Pharmaceuticals, Inc. (a wholly-owned subsidiary of Takeda Pharmaceuticals Company Limited), overseeing the clinical development and worldwide approval of VELCADE ®, a first-in-class cancer therapy now approved to treat multiple myeloma and non-Hodgkins lymphoma. He currently serves on the board of directors of Foundation Medicine, Inc., bluebird bio, Inc., and Blueprint Medicines Inc., all private biopharmaceutical companies. Dr. Schenkein holds a B.A. in chemistry from Wesleyan University and an M.D. from the State University of New York Upstate Medical School. We believe that Dr. Schenkein's detailed knowledge of our company and his extensive background in the biotechnology industry, including his roles at Genentech and Millennium, provide a critical contribution to our board of directors.

Duncan Higgons joined Agios in May 2009 as chief operating officer. Prior to joining Agios, Mr. Higgons worked at Archemix Corporation, a privately held biopharmaceutical company, from 2006 to 2009, where he most recently served as president, chief operating officer and interim chief executive officer. Prior to Archemix, Mr. Higgons served as the chief commercial officer at TransForm Pharmaceuticals, Inc., a privately-held biotechnology company which was acquired by Johnson & Johnson Company. Mr. Higgons holds a B.Sc. in mathematics from King's College University of London and an M.Sc. in economics from London Business School.

Scott Biller, Ph.D. joined Agios in September 2010 as chief scientific officer, with more than 25 years of drug discovery and development experience. Most recently, from 2003 to September 2010, he was vice president and head of global discovery chemistry at the Novartis Institutes for Biomedical Research (NIBR). Prior to that, Dr. Biller held the positions of vice president, pharmaceutical candidate optimization at the Bristol Myers Squibb or BMS, Pharmaceutical Research Institute and executive director of drug discovery chemistry for the BMS research site in Lawrenceville, New Jersey. Among his other key leadership positions at BMS, Dr. Biller was the executive director of metabolic diseases chemistry. He contributed to robust pipelines at both BMS and Novartis, culminating in two medicines launched worldwide (Onglyza ® for the treatment of Type 2 diabetes and Juxtapid® for familial hypercholesterolemia) and three additional drugs reaching phase 3 clinical development. Dr. Biller earned a S.B. degree in chemistry at MIT, a Ph.D. in organic chemistry at Caltech and was an NIH Postdoctoral Fellow at Columbia University in natural product synthesis.

Glenn Goddard joined Agios in July 2010 as vice president, finance, and brings more than 10 years of experience in emerging private and public platform-based biopharmaceutical companies. Prior to joining Agios, Mr. Goddard worked from 2004 to 2010 at Archemix, where he most recently served as the vice president of finance. During his time at Archemix he oversaw all aspects of financial operations. Prior to Archemix, he was the corporate controller of ImmunoGen, Inc., a publicly traded oncology-focused biopharmaceutical company. During his time at ImmunoGen, Mr. Goddard was responsible for external financial reporting, financial planning and tax compliance, and initiated the company's Sarbanes-Oxley compliance efforts. Earlier in his career, he was an audit supervisor within the Technology, Communication and Entertainment group of Ernst & Young, LLP and an audit manager at Feeley & Driscoll, P.C. Mr. Goddard is a graduate of Bentley College, where he earned a B.S. in accountancy, and is a certified public accountant in the Commonwealth of Massachusetts.

Shin-San Michael Su, Ph.D. is one of our founding scientists and has served as senior vice president, research & development since 2012. Dr. Su brings more than 20 years of organization, project management and scientific experience in the biotechnology industry to Agios. Most recently, from 2004 to 2006 he served as general director and vice president of the Biomedical Engineering Research Laboratory (BEL) at ITRI in Taiwan. Prior to that, he spent 14 years in a number of roles, concluding his tenure as program executive and vice president of the Novartis kinase collaboration for Vertex Pharmaceuticals, a publicly-traded a pharmaceutical company. Dr. Su earned his Ph.D. in biochemistry at Duke University and was a Helen Hay Whitney Fellow at Harvard University.

Lewis C. Cantley, *Ph.D.* has served as a member of our board of directors since August 2007. Dr. Cantley has served as a director of the Cancer Center at Weill Cornell Medical College and New York-Presbyterian Hospital since October 2012. Prior to that, from 1992 to 2012 Dr. Cantley was a professor of systems biology at Harvard Medical School and chief of the division of Signal Transduction at Beth Israel Deaconess Medical Center, a major teaching hospital of Harvard Medical School in Boston. From 2007 to 2012, Dr. Cantley served as director of the Cancer Center at Beth Israel Deaconess Medical Center. Dr. Cantley is a member of the American Academy of Arts and Sciences and the National Academy of Sciences, and serves on the editorial boards of the journals *Cell* and the *Journal of Cell Biology*. Dr. Cantley is the recipient of the 2005 Pezcoller Foundation-American Association for Cancer Research International Award for Cancer Research, for his leadership in the field of signal transduction, including the discovery of PI3K. Dr. Cantley received his B.S. in chemistry from West Virginia Wesleyan College, and obtained a Ph.D. in biophysical chemistry from Cornell University. Dr. Cantley's qualifications to sit on our board of directors include his position as a foremost expert in understanding the biochemical pathways linking cancer and metabolism.

Douglas G. Cole, M.D. has served as a member of our board of directors since December 2007. Dr. Cole has been a general partner of Flagship Ventures, where he has focused on life science investments, since 2001. He currently serves on the boards of directors of publicly-traded biopharmaceutical companies Tetraphase Pharmaceuticals, Inc. and Receptos, Inc., and on the boards of directors of several private biopharmaceutical companies, including Ensemble Therapeutics, Concert Pharmaceuticals, Inc., Quanterix Corporation, Selecta Biosciences, Inc., Avedro, Inc., and Syros Pharmaceuticals Inc. In the past five years Dr. Cole has served on the boards of Seventh Sense Biosystems, Inc., Resolvyx Pharmaceuticals, Inc., AVEO Pharmaceuticals, Inc., Zalicus, Inc. (formerly CombinatoRx), CGI Pharmaceuticals, and Morphotek Inc. Dr. Cole holds a B.A. in English from Dartmouth College and an M.D. from the University of Pennsylvania School of Medicine. We believe Dr. Cole's qualifications to sit on our board of directors include his substantial experience as an investor in early stage biopharmaceutical and life sciences companies, as well as his experience of serving on the board of directors for several biopharmaceutical companies.

Perry Karsen has served as a member of our board of directors since November 2011. Mr. Karsen currently serves as the chief executive officer of the Celgene Cellular Therapeutics division of Celgene Corporation, a publicly-traded global biopharmaceutical company, and as executive vice president of Celgene Corporation. Mr. Karsen served as chief operations officer of Celgene from July 2010 to May 2013, and as senior vice president and head of worldwide business development of Celgene from 2004 to 2009. Between February 2009 and July 2010, Mr. Karsen was chief executive officer of Pearl Therapeutics, a privately held biotechnology company. Prior to his tenure with Celgene, Mr. Karsen held executive positions at Human Genome Sciences, Bristol-Myers Squibb, Genentech and Abbott Laboratories. In addition, Mr. Karsen served as a general partner at Pequot Ventures. Mr. Karsen serves as a member of the boards of directors of the Biotechnology Industry Organization (BIO), BayBio and the Life Sciences Foundation. Mr. Karsen has a Masters of Management degree from Northwestern University's Kellogg Graduate School of Management, a Masters in Teaching of Biology from Duke University, and a B.S. in Biological Sciences from the University of Illinois, Urbana-Champaign. Mr. Karsen brings to his service as a director his significant executive leadership experience, including his experience as an executive at some of the largest and most successful multi-national pharmaceutical companies, as well as his membership on boards of directors of various trade organizations.

John M. Maraganore, Ph.D. has served as a member of our board of directors since November 2011. Since December 2002, Dr. Maraganore has served as the chief executive officer and as a director of Alnylam Pharmaceuticals, Inc., a publicly-traded biopharmaceutical company. From December 2002 to December 2007, Dr. Maraganore served as president of Alnylam. From April 2000 to December 2002, Dr. Maraganore served as senior vice president, strategic product development with Millennium. Before Millennium, he served as director of molecular biology and director of market and business development at Biogen, Inc. (now Biogen Idec, Inc.), a publicly-traded company. Prior to Biogen, Dr. Maraganore was a scientist at ZymoGenetics, Inc. and The Upjohn Company. Dr. Maraganore is also chairman of Regulus Therapeutics, Inc., a publicly-traded company, and a director of bluebird bio, Inc. and Tempero Pharmaceuticals. In addition, he is a venture partner at Third Rock Ventures, L.P., where he participates in a limited capacity focusing on guiding strategy for Third Rock and its portfolio companies. He is also a member of the Immunology Advisory Council of Harvard Medical School and a member of the board of directors of the Biotechnology Industry Organization. Dr. Maraganore holds an M.S. and a Ph.D. in Biochemistry and Molecular Biology from the University of Chicago and a B.A. in Biological Sciences from the University of Chicago. Dr. Maraganore has over 25 years of experience in the biotechnology industry, bringing to our board critical scientific, research and development, and general management expertise.

Robert T. Nelsen has served as a member of our board of directors since December 2007. Mr. Nelsen was a co-founder of ARCH Venture Partners, a venture capital firm, and has served in various capacities for ARCH and affiliated entities since July 1986. He is currently a managing director of ARCH Venture Corporation. Mr. Nelsen has played a significant role in the early sourcing, financing and development of more than 30 companies. Mr. Nelsen is a director of Ikaria, Inc., Kythera Biopharmaceuticals, Inc., Sapphire Energy, Inc., Fate Therapeutics, Inc., Ensemble Therapeutics Corporation, NeurogesX, Inc., Syros Pharmaceuticals Inc., and serves as chairman of the board of Hua Medicine. Mr. Nelsen also serves as a Trustee of the Fred Hutchinson Cancer Research Institute, the Institute for Systems Biology, and is a director of the National Venture Capital

Association. Mr. Nelsen previously served on the boards of Illumina, Inc, Caliper Life Sciences, Inc, Adolor Corporation, Receptos, Inc., and entities affiliated with deCode Genetics, Inc, among others. Mr. Nelsen received a B.S. with majors in biology and economics from the University of Puget Sound and an M.B.A. from the University of Chicago. We believe Mr. Nelsen is qualified to sit on our board of directors due to his extensive experience as an investor in, and director of, early stage biopharmaceutical and life sciences companies.

Kevin P. Starr has served as a member of our board of directors since June 2008. Since April 2007, Mr. Starr has been a Partner of Third Rock Ventures, a venture capital firm. From January 2003 to March 2007, Mr. Starr was an entrepreneur. From December 2001 to December 2002, Mr. Starr served as chief operating officer of Millennium. He also served as Millennium's chief financial officer from December 1998 to December 2002. Mr. Starr currently serves on the board of directors of Alnylam. Mr. Starr also serves on the boards of Zafgen, Inc., PanOptica, Inc., MyoKardia, Inc., Global Blood Therapeutics, Inc., Afferent Pharmaceuticals, and SAGE Therapeutics. Mr. Starr received an M.S. in corporate finance from Boston College and a B.A. in mathematics and business from Colby College. Mr. Starr's qualifications to serve on our board of directors include executive management roles with responsibility over key financial and business planning functions, including extensive experience in the oversight of financial audits, the design and implementation of financial controls, and corporate governance best practices. In addition, as an entrepreneur and venture capitalist, Mr. Starr has focused on the formation, development and business strategy of multiple start-up companies.

Marc Tessier-Lavigne, Ph.D. has served as a member of our board of directors since September 2011. Dr. Tessier-Lavigne has served as president of the Rockefeller University, as well as professor and head of the Laboratory of Brain Development and Repair, since 2011. Previously, he was employed at Genentech Inc. from 2003 to 2011, where he became executive vice president for research and chief scientific officer, and directed 1,400 people in disease research and drug discovery in cancer, immune disorders, infectious diseases and neurodegenerative diseases. Prior to his tenure at Genentech, Dr. Tessier-Lavigne was an investigator with the Howard Hughes Medical Institute from 1994 to 2003 and a professor at Stanford University and the University of California, San Francisco from 1991 to 2003. He is a member of the Board of Directors of Pfizer Inc. and Regeneron Pharmaceuticals Inc. He is a member of the National Academy of Sciences and its Institute of Medicine, and a fellow of the Royal Society (UK), the Royal Society of Canada, the American Academy of Arts and Sciences, the American Association for the Advancement of Science, and the Academy of Medical Sciences (UK). Dr. Tessier-Lavigne earned undergraduate degrees from McGill University and from Oxford University, where he was a Rhodes Scholar. He received his Ph.D. from University College London, and conducted postdoctoral work at the MRC Developmental Neurobiology Unit in London and at Columbia University. Dr. Tessier-Lavigne's qualifications to sit on our board of directors include his pioneering research, his deep scientific knowledge and his reputation as an exceptional leader in the biotechnology industry.

Board composition

Our board of directors is currently authorized to have nine members. Upon the closing of this offering, our board of directors will consist of eight directors and one vacancy. In accordance with the terms of our certificate of incorporation and bylaws that will become effective upon the closing of this offering, our board of directors will be divided into three classes, class I, class II and class III, with members of each class serving staggered three-year terms. Upon the closing of this offering, the members of the classes will be divided as follows:

- the class I directors will be Dr. Cantley and Mr. Karsen, and their term will expire at the annual meeting of stockholders to be held in 2014;
- the class II directors will be Drs. Cole and Maraganore and Mr. Starr, and their term will expire at the annual meeting of stockholders to be held in 2015; and
- the class III directors will be Drs. Schenkein and Tessier-Lavigne and Mr. Nelsen, and their term will expire at the annual meeting of stockholders to be held in 2016.

Upon the expiration of the term of a class of directors, directors in that class will be eligible to be elected for a new three-year term at the annual meeting of stockholders in the year in which their term expires. In accordance

with the terms of our certificate of incorporation and bylaws that will become effective upon the closing of this offering, our directors may be removed only for cause by the affirmative vote of the holders of 75% or more of our voting stock.

We have no formal policy regarding board diversity. Our priority in selection of board members is identification of members who will further the interests of our stockholders through his or her established record of professional accomplishment, the ability to contribute positively to the collaborative culture among board members, knowledge of our business and understanding of the competitive landscape.

Director independence

Rule 5605 of the NASDAQ Listing Rules requires a majority of a listed company's board of directors to be comprised of independent directors within one year of listing. In addition, the NASDAQ Listing Rules require that, subject to specified exceptions, each member of a listed company's audit, compensation and nominating and corporate governance committees be independent and that audit committee members also satisfy independence criteria set forth in Rule 10A-3 under the Securities Exchange Act of 1934, as amended, or the Exchange Act.

Under Rule 5605(a)(2) of the NASDAQ Listing Rules, a director will only qualify as an "independent director" if, in the opinion of our board of directors, that person does not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. In order to be considered independent for purposes of Rule 10A-3 of the Exchange Act, a member of an audit committee of a listed company may not, other than in his or her capacity as a member of the audit committee, the board of directors, or any other board committee, accept, directly or indirectly, any consulting, advisory, or other compensatory fee from the listed company or any of its subsidiaries or otherwise be an affiliated person of the listed company or any of its subsidiaries.

In June 2013, our board of directors undertook a review of the composition of our board of directors and its committees and the independence of each director. Based upon information requested from and provided by each director concerning his background, employment and affiliations, including family relationships, our board of directors has determined that each of our directors, with the exception of Drs. Schenkein and Cantley and Mr. Karsen, is an "independent director" as defined under Rule 5605(a)(2) of the NASDAQ Listing Rules. Our board of directors also determined that Drs. Cole and Maraganore and Mr. Starr, who will comprise our audit committee following this offering, Drs. Maraganore and Tessier-Lavigne and Mr. Nelsen, who will comprise our compensation committee following this offering, and Dr. Cole and Mr. Starr, who will be members of our nominating and corporate governance committee following this offering, satisfy the independence standards for such committees established by the Securities and Exchange Commission and the NASDAQ Listing Rules, as applicable. In making such determinations, our board of directors considered the relationships that each such non-employee director has with our company and all other facts and circumstances our board of directors deemed relevant in determining independence, including the beneficial ownership of our capital stock by each non-employee director.

There are no family relationships among any of our directors or executive officers.

Board committees

Our board has established three standing committees—audit, compensation, and nominating and corporate governance—each of which will, upon the closing of this offering, operate under a charter that has been approved by our board.

Audit committee

The members of our audit committee are Drs. Cole and Maraganore and Mr. Starr. Dr. Maraganore is the chair of the audit committee. Our board of directors has determined that Mr. Starr qualifies as an audit committee financial expert within the meaning of SEC regulations and the NASDAQ Listing Rules. In making this

determination, our board has considered the formal education and nature and scope of his previous experience, coupled with past and present service on various audit committees. Our audit committee assists our board of directors in its oversight of our accounting and financial reporting process and the audits of our financial statements. Following this offering, our audit committee's responsibilities will include:

- appointing, approving the compensation of, and assessing the independence of our registered public accounting firm;
- overseeing the work of our registered public accounting firm, including through the receipt and consideration of reports from such firm;
- reviewing and discussing with management and the registered public accounting firm our annual and quarterly financial statements and related disclosures;
- monitoring our internal control over financial reporting, disclosure controls and procedures and code of business conduct and ethics;
- overseeing our internal audit function;
- discussing our risk management policies;
- establishing policies regarding hiring employees from the registered public accounting firm and procedures for the receipt and retention of accounting related complaints and concerns;
- meeting independently with our internal auditing staff, registered public accounting firm and management;
- reviewing and approving or ratifying any related person transactions; and
- preparing the audit committee report required by SEC rules.

Compensation committee

The members of our compensation committee are Drs. Maraganore and Tessier-Lavigne and Mr. Nelsen. Dr. Tessier-Lavigne is the chair of the compensation committee. Our compensation committee assists our board of directors in the discharge of its responsibilities relating to the compensation of our executive officers. Following this offering, the compensation committee's responsibilities will include:

- reviewing and approving corporate goals and objectives relevant to CEO compensation;
- reviewing and approving, or making recommendations to our board with respect to, the compensation of our chief executive officer and our other executive officers;
- overseeing an evaluation of our senior executives;
- overseeing and administering our cash and equity incentive plans;
- reviewing and making recommendations to our board with respect to director compensation;
- reviewing and discussing with management our "Compensation Discussion and Analysis"; and
- preparing the compensation committee report required by SEC rules.

Nominating and corporate governance committee

The members of our nominating and corporate governance committee are Drs. Cantley and Cole and Mr. Starr. Mr. Starr is the chair of the nominating and corporate governance committee. Following this offering, the nominating and corporate governance committee's responsibilities will include:

- identifying individuals qualified to become board members;
- recommending to our board the persons to be nominated for election as directors and to each committee of our board of directors;

- reviewing and making recommendations to the board with respect to management succession planning;
- developing and recommending corporate governance principles to the board; and
- overseeing periodic evaluations of the board.

We believe that the composition of our nominating and corporate governance committee will meet the requirements for independence under current NASDAQ and SEC rules and regulations. Our board of directors has determined that Dr. Cole and Mr. Starr are independent as independence is currently defined in applicable NASDAQ listing standards. Although the board of directors determined that Dr. Cantley does not satisfy the independence standards, under NASDAQ Marketplace Rule 5615(b)(1), we are permitted to phase in our compliance with the independent nominating and corporate governance committee requirements set forth in NASDAQ Marketplace Rule 5605(e) as follows: (1) one independent member at the time of listing, (2) a majority of independent members within 90 days of listing and (3) all independent members within one year of listing. Within one year of our listing on the NASDAQ Global Select Market, we expect that our nominating and corporate governance committee will comply with the independence requirements under the NASDAQ Marketplace Rules.

Compensation committee interlocks and insider participation

During 2012, the members of our compensation committee were John M. Maraganore, Robert T. Nelsen, and Kevin P. Starr. Mr. Starr, who will cease to serve as a member of our compensation committee upon the closing of this offering, was formerly our interim chief executive officer. No other current or former member of our compensation committee is or has been a current or former officer or employee of Agios. None of our executive officers served as a director or a member of a compensation committee (or other committee serving an equivalent function) of any other entity, one of whose executive officers served as a director or member of our compensation committee during the fiscal year ended December 31, 2012.

Code of ethics and code of conduct

We have adopted a written code of business conduct and ethics that applies to our directors, officers and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. We intend to post on our website, www.agios.com, a current copy of the code and all disclosures that are required by law or NASDAQ stock market listing standards concerning any amendments to, or waivers from, any provision of the code.

Executive compensation

This section discusses the material elements of our executive compensation policies and decisions and the most important factors relevant to an analysis of these policies and decisions. It provides qualitative information regarding the manner and context in which compensation is awarded to and earned by our executive officers named in the "Summary compensation table" below and is intended to place in perspective the data presented in the following tables and the corresponding narrative.

Summary compensation table

The following table sets forth information regarding compensation earned by our chief executive officer and our other executive officers during the fiscal years ending December 31, 2011 and 2012. We sometimes refer to these executive officers as our named executive officers elsewhere in this prospectus.

Name and principal position	Year	Salary ($)	Option awards ($)(1)	Non-equity incentive plan compensation ($)(2)	All other compensation ($)(3)	Total ($)
David P. Schenkein, M.D.(4)	2012	$ 425,000	$ 134,513	$ 136,000	$ 2,764	$ 698,277
Chief Executive Officer	2011	$ 425,000	$ 13,462	$ 170,000	$ 2,764	$ 611,226
Duncan Higgons	2012	$ 350,008	$ 117,699	$ 98,002	$ 2,665	$ 568,374
Chief Operating Officer	2011	$ 350,008	$ 5,387	$ 122,503	$ 2,665	$ 480,563
Scott Biller, Ph.D.	2012	$ 376,000	$ 117,699	$ 105,280	$ 3,052	$ 602,031
Chief Scientific Officer	2011	$ 376,000	—	$ 131,600	$ 2,881	$ 510,481
Glenn Goddard	2012	$ 253,707	$ 53,805	$ 30,445	$ 2,264	$ 340,221
Vice President, Finance	2011	$ 244,537	$ 5,864	$ 40,000	$ 2,235	$ 292,636

(1) Amounts listed represent the aggregate fair value amount computed as of the grant date of the option awards granted during 2011 and 2012 in accordance with FASB ASC Topic 718. Assumptions used in the calculation of these amounts are included in Note 9, Share-Based Payments, of the Notes to our Consolidated Financial Statements.

(2) Amounts represent awards to our named executive officers under our annual performance-based cash incentive program. See "—Annual performance-based cash incentives" for a description of that program. Annual cash incentive compensation for 2012 was earned in 2012 and paid in 2012. Annual cash incentive compensation for 2011 was earned in 2011 and paid in 2012.

(3) Amounts represent the dollar value of group life insurance premiums paid during the fiscal year with respect to life insurance for the named executive officer, as well as premiums paid by us for short- and long-term disability insurance policies consistent with those provided to all of our employees.

(4) Dr. Schenkein also serves as a member of our board of directors but does not receive any additional compensation for his service as a director.

Base salary

Base salaries are used to recognize the experience, skills, knowledge and responsibilities required of our executive officers. Base salaries for our executive officers typically are established through arm's length negotiation at the time the executive officer is hired, taking into account the position for which the executive officer is being considered and the executive officer's qualifications, prior experience and prior salary. None of our executive officers is currently party to an employment agreement that provides for automatic or scheduled increases in base salary. However, on an annual basis, our compensation committee reviews and evaluates, with input from our chief executive officer, the need for adjustment of the base salaries of our executive officers based on changes and expected changes in the scope of an executive officer's responsibilities, including promotions, the individual contributions made by and performance of the executive officer during the prior fiscal year, the executive officer's performance over a period of years, overall labor market conditions, the relative ease or

difficulty of replacing the executive with a well-qualified person, our overall growth and development as a company and general salary trends in our industry and among our peer group and where the executive officer's salary falls in the salary range presented by that data. In making decisions regarding salary increases, we may also draw upon the experience of members of our board of directors with other companies. No formulaic base salary increases are provided to our executive officers.

In each of 2012 and 2011, we paid base salaries to Dr. Schenkein, Mr. Higgons and Dr. Biller of $425,000, $350,008, and $376,000, respectively. We paid base salaries of $253,707 and $244,537 to Mr. Goddard in 2012 and 2011, respectively.

Annual performance-based cash incentives

We have designed our annual performance-based cash incentive program to emphasize pay-for-performance and to reward our executive officers for the achievement of the preceding year's performance guided by specified annual corporate and individual objectives. Historically, each executive officer has been eligible, at our board of directors' discretion, to receive an annual performance-based cash incentive, which we refer to as an annual cash incentive, in an amount corresponding to a percentage of his base salary. The amount of the annual cash incentive has been determined by our board of directors, based upon the recommendation of the compensation committee, by looking at the totality of anticipated and unanticipated achievements by us and the individual executive officer in the preceding year, including our performance against specific scientific, research, clinical, operational and financial corporate objectives. In recent years, these annual corporate objectives have primarily focused on the advancement of our lead programs.

Our compensation committee has historically targeted annual cash incentive levels for our executives below industry average for companies at the same life stage and approximate headcount. Our compensation committee has authority to adjust the incentive percentage each year in connection with its review of our and the executive officer's performance.

In 2012, we awarded cash incentives to Dr. Schenkein, Mr. Higgons, Dr. Biller and Mr. Goddard in the amounts of $136,000, $98,002, $105,280 and $30,445, respectively, in each case based on corporate and individual accomplishments with respect to research, preclinical and operational objectives. In 2011, we awarded cash incentives to Dr. Schenkein, Mr. Higgons, Dr. Biller and Mr. Goddard in the amounts of $170,000, $122,503, $131,600 and $40,000, respectively, in each case based on corporate and individual accomplishments with respect to research and operational objectives.

Equity incentive awards

Our equity award program is the primary vehicle for offering long-term incentives to our executives. While we do not currently have any equity ownership guidelines for our executives, we believe that equity grants provide our executives with a strong link to our long-term performance, create an ownership culture and help to align the interests of our executives and our stockholders. Because our executives benefit from stock options only if our stock price increases relative to the stock option's exercise price through the creation of shareholder value, we believe stock options provide meaningful incentives to our executives to achieve increases in the value of our stock over time. In addition, the vesting feature of our equity grants contributes to executive retention by providing an incentive to our executives to remain employed by us during the vesting period. Prior to this offering, our executives were eligible to participate in the 2007 stock incentive plan, as amended, or the 2007 Plan. During 2012, all stock options were granted pursuant to the 2007 Plan. Following the closing of this offering, our employees and executive officers will be eligible to receive stock options and other stock-based awards pursuant to the 2013 stock incentive plan, or the 2013 Plan.

We use stock options to compensate our executive officers in the form of initial grants in connection with the commencement of employment, generally on an annual basis thereafter, and also at various times, often but not

necessarily annually, if we have performed as expected or better. Prior to this offering, the award of such stock options to our executive officers has been made upon the recommendation of the compensation committee and the approval of our board of directors. None of our executive officers is currently party to an employment agreement that provides for automatic award of stock options. We grant stock options to our executive officers with both time-based and performance-based vesting. The options that we grant to our executive officers with time-based vesting typically become exercisable as to 25% of the shares underlying the option on the first anniversary of the grant date, and as to an additional 1/48th of the shares underlying the option monthly thereafter. The options that we grant to our executive officers with performance-based vesting become exercisable upon the attainment of certain preclinical, clinical and regulatory milestone events recommended by the compensation committee and approved by our board of directors. Vesting and exercise rights cease shortly after termination of employment except in the case of death or disability; provided that, for certain of our executive officers, in the case of termination without cause or for good reason either before or after a change in control, a portion or all of the shares underlying unvested awards will accelerate and become exercisable. Prior to the exercise of an option, the holder has no rights as a stockholder with respect to the shares subject to such option, including no voting rights and no right to receive dividends or dividend equivalents.

In determining the size of the annual stock option grants to recommend for our executives, our compensation committee has historically considered industry data including information regarding comparative stock ownership and equity grants received by other executives in our industry. Our compensation committee has targeted equity ownership levels for our executive officers between the 50th and 75th percentile of the industry average for companies at the same life size, stage, approximate headcount and valuation. In addition, our compensation committee has considered our corporate performance, the potential for enhancing the creation of value for our stockholders, the amount of equity previously awarded to the executive officers and the vesting terms of such prior awards.

We have historically granted stock options with exercise prices that are equal to the fair market value of our common stock on the date of grant as determined by our board of directors, based on a number of objective and subjective factors. The exercise price of all stock options granted after the closing of this offering will be equal to the fair market value of shares of our common stock on the date of grant, which will be determined by reference to the closing market price of our common stock on the date of grant.

In 2012, we granted options to purchase 72,727, 63,636, 63,636 and 29,090 shares of our common stock to Dr. Schenkein, Mr. Higgons, Dr. Biller and Mr. Goddard, respectively. In 2011, we granted options to purchase 36,363, 14,545, and 10,909 shares of our common stock to Dr. Schenkein, Mr. Higgons and Mr. Goddard, respectively. In each case these grants were based on the executive officer's existing equity incentive holdings, level of responsibility within our company and our subjective assessment of the executive officer's individual performance and our overall corporate performance, in each case without reference to any specific metric.

In April 2013, our board of directors granted option awards to our named executive officers, pursuant to our 2007 Plan as follows:

Name	Option award (#)	Grant date fair value(1)
David P. Schenkein, M.D.	136,363	$ 957,062
Duncan Higgons	68,181	$ 478,531
Scott Biller, Ph.D.	68,181	$ 478,531
Glenn Goddard	14,545	$ 97,888

(1) See Note 9, Share-based Payments, of the Notes to our Consolidated Financial Statements regarding assumptions underlying the valuation of equity awards.

For more information on the terms of employment and compensation of our named executive officers, see "Employment, severance and change in control arrangements" below.

2012 Outstanding equity awards at fiscal year-end

The following table sets forth information concerning outstanding equity awards for each of our named executive officers at December 31, 2012:

	Option awards					Stock awards	
Name	Number of securities underlying unexercised options exercisable (#)	Number of securities underlying unexercised options unexercisable (#)	Equity incentive plan awards: number of securities underlying unexercised unearned options (#)	Option exercise price ($)	Option expiration date	Number of shares or units of stock that have not vested (#)	Market value of shares or units of stock that have not vested ($)(1)
David P. Schenkein, M.D.(2)							
						90,909(3)	$1,636,362
	226,777	20,616(4)		$ 0.31	8/12/2019		
	316,531	63,306(5)		$ 0.31	8/12/2019		
	9,090		27,272(6)	$ 0.47	3/1/2021		
			72,727(7)	$ 2.34	4/5/2022		
Duncan Higgons(2)							
						18,938(8)	$ 340,884
	187,554	42,950(9)		$ 0.31	8/12/2019		
	41,666	3,788(4)		$ 0.31	8/12/2019		
	7,403	861(10)		$ 0.31	8/12/2019		
	33,333	3,030(4)		$ 0.31	3/25/2020		
	909		2,727(6)	$ 0.47	3/1/2021		
	5,227	5,681(11)		$ 0.47	3/1/2021		
			63,636(7)	$ 2.34	4/5/2022		
Scott Biller, Ph.D.(2)							
			24,000(12)	$ 0.47	12/6/2020		
			12,363(13)	$ 0.47	12/6/2020		
	122,727	95,454(14)		$ 0.47	12/6/2020		
			63,636(7)	$ 2.34	4/5/2022		
Glenn Goddard							
	27,461	17,992(15)		$ 0.47	8/11/2020		
	3,409	7,500(16)		$ 0.69	9/14/2021		
			29,090(7)	$ 2.34	4/5/2022		

(1) There was no public market for our common stock at December 31, 2012. We have estimated the market value of the unvested stock awards based on the initial public offering price of $18.00 per share.

(2) If the executive officer's employment is terminated by us without cause or by such named executive officer for good reason, as defined in his respective offer letter, prior to a change in control, the vesting of such named executive officer's option and restricted stock awards shall accelerate, such that (a) in the case of such a termination of the employment of Dr. Schenkein, all shares under any such awards held by him shall vest and (b) in the case of such a termination of the employment of Mr. Higgons or Dr. Biller, 25% of the original number of shares under any such awards held by him shall vest. The vesting of any option or restricted stock award held by such named executive officer shall be partially accelerated upon a change of control, such that 75% of the then unvested shares under any such award shall become vested. In addition, if such named executive officer's employment is terminated by us or our acquiror without cause or by such named executive officer for good reason within 18 months following a change of control, all of such named executive officer's option and restricted stock awards shall vest in full. See "Employment agreements, severance and change in control arrangements" below.

(3) The unvested shares are scheduled to vest and become free of the Company's repurchase rights in approximately equal monthly installments through August 1, 2013.

(4) The unvested shares are scheduled to vest in approximately equal monthly installments through June 3, 2013.

(5) The unvested shares are scheduled to vest in approximately equal monthly installments through August 1, 2013.

(6) The unvested shares are scheduled to vest as to 33% of the unvested shares upon the FDA's approval of our first IND application, with the remaining 67% vesting in approximately equal monthly installments over the following two years.
(7) The shares underlying this option vest as follows: 25% upon the identification of our second preclinical development candidate, as determined by our board of directors; 50% upon receipt of evidence of clinical efficacy or achievement of a pharmacodynamic endpoint, in each case, as defined within a clinical trial protocol with respect to any development candidate; and 25% on the first anniversary of the first date that both of the aforementioned milestones were achieved. On April 30, 2013, our board of directors determined that the first such milestone was achieved as of March 18, 2013, and 25% of the shares underlying the option vested.
(8) The unvested shares are scheduled to vest in approximately equal monthly installments through May 15, 2013.
(9) The unvested shares are scheduled to vest in approximately equal monthly installments through May 18, 2013.
(10) The unvested shares are scheduled to vest in approximately equal monthly installments through May 18, 2013.
(11) The unvested shares are scheduled to vest in approximately equal monthly installments through January 31, 2015.
(12) The unvested shares commence vesting upon the acceptance by Celgene of two development candidates under our collaboration agreement, at which point the shares will vest as follows: 25% immediately, with monthly vesting for the remaining unvested shares over the following three years. On April 30, 2013, our board of directors determined that this milestone was achieved as of March 18, 2013, and 25% of the shares underlying the option vested.
(13) The unvested shares commence vesting upon the closing of a significant new strategic collaboration, as determined by our board of directors, at which point the shares underlying this option will vest as follows: 25% immediately, with monthly vesting for the remaining unvested shares over the following three years.
(14) The unvested shares are scheduled to vest in approximately equal monthly installments through September 20, 2014.
(15) The unvested shares are scheduled to vest in approximately equal monthly installments through July 1, 2014.
(16) The unvested shares are scheduled to vest in approximately equal monthly installments through September 15, 2015.

For information on potential payments to our named executive officers in connection with their termination or a change in control, as provided in their respective offer letters, see "Employment agreements, severance and change in control arrangements" below.

Employment, severance and change in control arrangements

Offer letters

We have entered into employment offer letters with each of our executive officers pursuant to which such executive officer is employed "at will," meaning he or we may terminate the employment arrangement at any time. Such offer letters establish the executive officer's title, initial compensation arrangements, eligibility for benefits made available to employees generally, and, in the case of Drs. Schenkein and Biller and Mr. Higgons, also provide for certain benefits upon termination of employment under specified conditions. The following summarizes such termination benefits:

Benefits provided upon termination without cause or for good reason

Under the terms of the offer letters we have entered into with each of Drs. Schenkein and Biller and Mr. Higgons, subject to the execution and effectiveness of a release of claims against us, if such executive officer's employment is terminated by us without cause or by such executive officer for good reason, as defined in such offer letters, prior to a change of control, as defined in such offer letters, we will be obligated to (i) pay an amount equal to his then-current monthly base salary for a period of 12 months and his annual incentive cash incentive, (ii) continue to provide such executive officer with health and dental insurance consistent with the then-current benefit plans provided by us for a period of 12 months and (iii) accelerate the vesting of such

executive officer's option and restricted stock awards, such that (a) in the case of such a termination of the employment of Dr. Schenkein, all shares under any such awards held by him shall vest and (b) in the case of such a termination of the employment of Mr. Higgons or Dr. Biller, 25% of the original number of shares under any such awards held by him shall vest.

Benefits provided upon a change in control

Under the terms of the offer letters we have entered into with each of Drs. Schenkein and Biller and Mr. Higgons, the vesting of any option or restricted stock award held by such executive officers shall be partially accelerated upon a change of control, such that 75% of the then unvested shares under any such award shall become vested. In addition, if such executive officer's employment is terminated by us or our acquiror without cause or by such executive officer for good reason within 18 months following a change of control, all of such executive officer's option and restricted stock awards shall vest in full.

Other agreements

We have entered into non-competition, non-solicitation, confidentiality and assignment agreements with each of our executive officers. Under the non-competition, non-solicitation, confidentiality and assignment agreements, each executive officer has agreed (i) not to compete with us during his employment and for a period of one year after the termination of his employment, (ii) not to solicit our employees or customers during his employment and for a period of one year after the termination of his employment, (iii) to protect our confidential and proprietary information, and (iv) to assign to us related intellectual property that is developed during the course of his employment and for a period of six months after the termination of his employment, that results from tasks assigned by us or that results from the use of our property, premises, or confidential information.

Equity and non-equity incentive plans

2013 Stock incentive plan

In June 2013, our board of directors adopted, and in July 2013 our stockholders approved, the 2013 Plan. The 2013 Plan provides for the grant of incentive stock options, non-statutory stock options, stock appreciation rights, restricted stock awards, restricted stock units and other stock-based awards. Upon effectiveness of the 2013 Plan, the number of shares of our common stock that will be reserved for issuance under the 2013 Plan will be the sum of (1) 909,090 shares plus (2) the number of shares (up to 3,844,993 shares) equal to the sum of the number of shares of our common stock then available for issuance under the 2007 Plan, and the number of shares of our common stock subject to outstanding awards under the 2007 Plan, that expire, terminate or are otherwise surrendered, cancelled, forfeited or repurchased by us at their original issuance price pursuant to a contractual repurchase right plus (3) an annual increase, to be added on the first day of each fiscal year, beginning with the fiscal year ending December 31, 2014 and continuing until the expiration of the 2013 Plan, equal to the lesser of (i) 2,000,000 shares of our common stock, (ii) 4% of the outstanding shares on such date or (iii) an amount determined by our board of directors.

Our employees, officers, directors, consultants and advisors are eligible to receive awards under the 2013 Plan. However, incentive stock options may only be granted to our employees.

Pursuant to the terms of the 2013 Plan, our board of directors administers the 2013 Plan and, subject to any limitations in the 2013 Plan, selects the recipients of awards and determines:

- the number of shares of our common stock covered by options and the dates upon which the options become exercisable;

- the type of options to be granted;
- the duration of options, which may not be in excess of ten years;
- the exercise price of options; and
- the number of shares of our common stock subject to any stock appreciation rights, restricted stock awards, restricted stock units or other stock-based awards and the terms and conditions of such awards, including conditions for repurchase, issue price and repurchase price.

If our board of directors delegates authority to an executive officer to grant awards under the 2013 Plan, the executive officer has the power to make awards to all of our employees, except executive officers. Our board of directors will fix the terms of the awards to be granted by such executive officer, including the exercise price of such awards, and the maximum number of shares subject to awards that such executive officer may make.

Upon a merger or other reorganization event, our board of directors may, in its sole discretion, take any one or more of the following actions pursuant to the 2013 Plan as to some or all outstanding awards other than restricted stock:

- provide that all outstanding awards shall be assumed, or substantially equivalent awards shall be substituted, by the acquiring or successor corporation (or an affiliate thereof);
- upon written notice to a participant, provide that all of the participant's unexercised awards will terminate immediately prior to the consummation of such reorganization event unless exercised by the participant;
- provide that outstanding awards shall become exercisable, realizable or deliverable, or restrictions applicable to an award shall lapse, in whole or in part, prior to or upon such reorganization event;
- in the event of a reorganization event pursuant to which holders of shares of our common stock will receive a cash payment for each share surrendered in the reorganization event, make or provide for a cash payment to the participants with respect to each award held by a participant equal to (i) the number of shares of common stock subject to the vested portion of the award (after giving effect to any acceleration of vesting that occurs upon or immediately prior to such reorganization event) multiplied by (ii) the excess, if any, of the cash payment for each share surrendered in the reorganization event over the exercise, measurement or purchase price of such award and any applicable tax withholdings, in exchange for the termination of such award;
- provide that, in connection with a liquidation or dissolution, awards shall convert into the right to receive liquidation proceeds; and/or
- any combination of the foregoing.

In the case of certain restricted stock units, no assumption or substitution is permitted, and the restricted stock units will instead be settled in accordance with the terms of the applicable restricted stock unit agreement.

Upon the occurrence of a reorganization event other than a liquidation or dissolution, the repurchase and other rights with respect to outstanding restricted stock will continue for the benefit of the successor company and will, unless the board of directors may otherwise determine, apply to the cash, securities or other property into which shares of our common stock are converted or exchanged pursuant to the reorganization event. Upon the occurrence of a reorganization event involving a liquidation or dissolution, all restrictions and conditions on each outstanding restricted stock award will automatically be deemed terminated or satisfied, unless otherwise provided in the agreement evidencing the restricted stock award.

At any time, our board of directors may, in its sole discretion, provide that any award under the 2013 Plan will become immediately exercisable in full or in part, free of some or all restrictions or conditions, or otherwise realizable in full or in part.

No award may be granted under the 2013 Plan on or after July 10, 2023. Our board of directors may amend, suspend or terminate the 2013 Plan at any time, except that stockholder approval will be required to comply with applicable law or stock market requirements.

2007 Stock incentive plan

The 2007 Plan was first adopted by our board of directors and first approved by our stockholders in September 2007 and was amended in June 2008, August 2009, September 2010 and March 2012. The 2007 Plan provides for the grant of incentive stock options within the meaning of Section 422 of the Internal Revenue Code, non-statutory stock options, stock awards, restricted stock awards and stock appreciation rights. Our employees, officers, directors, consultants and advisors are eligible to receive awards and stock appreciation rights under the 2007 Plan. However, incentive stock options may only be granted to our employees. The terms of awards are set forth in the applicable award agreements. Pursuant to the terms of the 2007 Plan, our board of directors, or a committee appointed by our board, administers the 2007 Plan. Our board of directors may delegate authority to one or more of our officers to grant awards under the 2007 Plan, in which case such officer will have the power to make awards to all of our employees, except executive officers. Our board of directors will fix the terms of the awards to be granted by such officer, including the exercise price of such awards and the maximum number of shares subject to awards that such officer may make.

As of May 31, 2013, (i) there were 5,079,642 shares of our common stock reserved for issuance under the 2007 Plan, subject to adjustment as provided below; (ii) there were outstanding options to purchase an aggregate of 3,695,065 shares of common stock at a weighted average exercise price of $2.23 per share; and (iii) there were outstanding 76,719 shares of unvested restricted common stock. Upon the closing of this offering, we will grant no further stock options or other awards under the 2007 Plan. However, any shares of common stock reserved for issuance under the 2007 Plan that remain available for issuance and any shares of common stock subject to awards under the 2007 Plan that expire, terminate, or are otherwise surrendered, canceled, forfeited or repurchased without having been fully exercised or resulting in any common stock being issued will be available for issuance under the 2013 Plan up to a specified number of shares.

In the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event, or any dividend or distribution to holders of our common stock other than an ordinary cash dividend:

- the number and class of securities available under the 2007 Plan;
- the number and class of securities and exercise price per share of each outstanding option under the 2007 Plan;
- the number of shares subject to and the repurchase price per share subject to each outstanding restricted stock award under the 2007 Plan; and/or
- the terms of each other outstanding award under the 2007 Plan

shall be equitably adjusted by the administrator (or substitute awards may be made, if applicable).

Upon a reorganization event, as defined in the 2007 Plan, the administrator may, in the case of awards under the 2007 Plan other than restricted stock awards, take one or more of the following actions as to all or any, or any portion of, outstanding awards, other than restricted stock awards:

- arrange for or provide that each outstanding award will be assumed or a substantially similar award will be substituted by the acquiring or succeeding corporation (or an affiliate thereof);
- provide, upon notice to the participant, that unexercised awards will terminate immediately prior to the consummation of such transaction unless exercised within a specified period of time following the date of such notice;
- provide that outstanding awards will become vested or exercisable, or restrictions applicable to such awards will lapse, in full or in part, at or immediately prior to such event;

- in the event of a reorganization event under the terms of which holders of our common stock will receive a cash payment per share surrendered in the transaction, make or provide for an equivalent cash payment in exchange for the termination of such equity awards;
- provide that in the event of a liquidation or dissolution, awards will convert into the right to receive liquidation proceeds; or
- any combination of the foregoing.

Upon a reorganization event, as defined in the 2007 Plan, other than a liquidation or dissolution, the repurchase and other rights we may have under each outstanding restricted stock award under the 2007 Plan shall inure to the benefit of our successor and shall, unless the administrator determines otherwise, apply to the cash, securities or other property which our common stock was converted into or exchanged for pursuant to such reorganization event in the same manner and to the same extent as they applied to the common stock subject to such restricted stock award. Upon a reorganization event involving a liquidation or dissolution, except to the extent specifically provided to the contrary in the instrument evidencing any restricted stock award under the 2007 Plan or any other agreement between a participant and us, all restrictions and conditions on all restricted stock awards then outstanding shall automatically be deemed terminated or satisfied.

The administrator may at any time provide that any award under the 2007 Plan shall become immediately exercisable in full or in part, free of some or all restrictions or conditions, or otherwise realizable in full or in part. The administrator may amend, modify or terminate any outstanding award under the 2007 Plan, including but not limited to, substituting another award of the same or a different type, changing the date of exercise or realization, and converting an incentive stock option to a nonstatutory stock option, subject in certain cases to the participant's consent.

2013 Employee stock purchase plan

In June 2013, our board of directors adopted, and in July 2013 our stockholders approved, the 2013 employee stock purchase plan, or the 2013 ESPP. The 2013 ESPP will be administered by our board of directors or by a committee appointed by our board of directors. The 2013 ESPP initially provides participating employees with the opportunity to purchase up to an aggregate of 327,272 shares of our common stock. The number of shares of our common stock reserved for issuance under the 2013 ESPP will automatically increase on the first day of each fiscal year, commencing on January 1, 2014 and ending on January 1, 2023, in an amount equal to the lowest of (i) 509,090 shares of our common stock, (ii) 1% of the total number of shares of our common stock outstanding on the first day of the applicable year, or (iii) an amount determined by our board of directors. The 2013 ESPP provides for six-month offering periods, commencing if and when approved by our board of directors, during which eligible employees may elect to have a specified percentage of their compensation withheld through payroll deductions for the purpose of purchasing shares at the end of the period. All of our employees or employees of any designated subsidiary, as defined in the 2013 ESPP, are eligible to participate in the 2013 ESPP, provided that:

- such person is customarily employed by us or a designated subsidiary for more than 20 hours a week and for more than five months in a calendar year;
- such person has been employed by us or by a designated subsidiary for at least six months prior to enrolling in the 2013 ESPP; and
- such person was our employee or an employee of a designated subsidiary on the first day of the applicable offering period under the 2013 ESPP.

No employee is eligible to purchase shares of our common stock that would result in the employee owning 5% or more of the total combined voting power or value of our stock immediately after such purchase. In addition under the 2013 ESPP, no employee may purchase common stock under the plan in excess of $25,000 for each calendar year, or such lesser amount as determined by our board of directors.

We expect to make one or more offerings to our employees to purchase stock under the 2013 ESPP. Offering periods under the 2013 ESPP will commence at such time or times as our board of directors may determine. Payroll deductions made during each offering period will be held for the purchase of our common stock at the end of the offering period.

On the commencement date of each offering period, each eligible employee may authorize up to a maximum of ten percent of his or her compensation to be deducted by us during the offering period. Each employee who continues to be a participant in the 2013 ESPP on the last business day of the offering period is deemed to have purchased shares, to the extent of accumulated payroll deductions within the 2013 ESPP ownership limits. Under the terms of the 2013 ESPP, the purchase price shall be determined by our board of directors for each offering period and will be at least 85% of the applicable closing price. If our board of directors does not make a determination of the purchase price, the purchase price will be 85% of the lesser of the closing price of our common stock on the first business day of the offering period or the last business day of the offering period. Our board of directors may, in its discretion, choose a different period of 12 months or less for each offering period.

An employee who is not a participant on the last day of the offering period is not entitled to purchase shares under the 2013 ESPP, and the employee's accumulated payroll deductions will be refunded. An employee's rights under the 2013 ESPP terminate upon voluntary withdrawal from an offering under the 2013 ESPP at any time, or when the employee ceases employment for any reason.

We will be required to make equitable adjustments in connection with the 2013 ESPP and any outstanding awards to reflect stock splits, reverse stock splits, stock dividends, recapitalizations, combination of shares, reclassification of shares, spin-offs and other similar changes in capitalization.

Our board of directors may at any time, and from time to time, amend or suspend the 2013 ESPP. We will obtain stockholder approval for any amendment if such approval is required by Section 423 of the Internal Revenue Code. Further, our board of directors may not make any amendment that would cause the 2013 ESPP to fail to comply with Section 423 of the Internal Revenue Code. Upon termination, we will refund all amounts in the accounts of participating employees that have not been used to purchase shares.

401(k) retirement plan

We maintain a 401(k) retirement plan that is intended to be a tax-qualified defined contribution plan under Section 401(k) of the Internal Revenue Code. In general, all of our employees are eligible to participate, beginning on the first day of the month following commencement of their employment. The 401(k) plan includes a salary deferral arrangement pursuant to which participants may elect to reduce their current compensation by up to the statutorily prescribed limit, equal to $17,500 in 2013, and have the amount of the reduction contributed to the 401(k) plan. Participants that will turn age 50 in 2013 are also eligible to make "catch-up" contributions, which in 2013 may be up to an additional $5,500 above the statutory limit.

2012 Director compensation

The following table sets forth information concerning the compensation for our non-employee directors during the fiscal year ended December 31, 2012:

Name	Fees earned or paid in cash ($)	Option awards ($)(1)	Total ($)
Lewis C. Cantley, Ph.D.(2)	—	—	—
Douglas G. Cole, M.D.	—	—	—
Perry Karsen	—	—	—
John M. Maraganore, Ph.D.	$ 35,000	$ 42,135(3)	$ 77,135
Robert T. Nelsen	—	—	—
Kevin P. Starr	—	—	—
Marc Tessier-Lavigne, Ph.D.	$ 20,000	$ 21,067(4)	$ 41,067

(1) Amounts listed represent the aggregate fair value amount computed as of the grant date of the option awards granted during 2012 in accordance with FASB ASC Topic 718. Assumptions used in the calculation of these amounts are included in Note 9, Share-based Payments, of the Notes to our Consolidated Financial Statements.

(2) Excludes $175,000 in annual compensation paid to Dr. Cantley pursuant to a consulting agreement under which Dr. Cantley serves as a special scientific consultant to us, with a commitment of one day per week. As of December 31, 2012, Dr. Cantley held 363,636 shares of our common stock and options to purchase 145,454 shares of our common stock.

(3) Represents an option to purchase 8,727 shares granted to Dr. Maraganore during 2012 for service on our board of directors. The shares subject to this option vest in full on December 4, 2013. Pursuant to an early exercise provision in the option agreement, Dr. Maraganore exercised this option on December 21, 2012 and received 8,727 shares of restricted stock, which shares vest in full on December 4, 2013. As of December 31, 2012, Dr. Maraganore held 36,000 shares of our common stock.

(4) Represents an option to purchase 4,363 shares granted to Dr. Tessier-Lavigne during 2012 for service on our board of directors. The shares subject to this option vest in full on December 4, 2013. As of December 31, 2012, Dr. Tessier-Lavigne held 45,454 shares of our common stock and options to purchase 4,363 shares of our common stock.

Dr. Schenkein, one of our directors who also serves as our chief executive officer, does not receive any additional compensation for his service as a director.

Prior to December 4, 2012, the compensation of our non-employee directors was established through arm's length negotiation at the time the director was elected, taking into account the responsibilities of each director and the director's qualifications and prior experience and industry data for such positions. This compensation was reviewed and recommended by our compensation committee and approved by our board of directors.

Dr. Maraganore was appointed to our board of directors as a non-employee director and chairperson of our compensation committee in June 2010. His annual cash compensation was set at $35,000, and he was awarded an option to purchase 27,272 shares of common stock. On December 4, 2012, he was awarded an option to purchase an additional 8,727 shares of common stock.

Dr. Tessier-Lavigne was appointed to our board of directors in September 2011 as an independent director and chairperson of the scientific sub-committee. His cash compensation was set at $16,000, and he was awarded an option to purchase 45,454 shares of our common stock. On December 4, 2012, he was awarded an option to purchase an additional 4,363 shares of common stock.

On December 4, 2012, our board of directors, upon the recommendation of our compensation committee, established the following compensation guidelines for non-employee board members:

- each non-employee director receives an option to purchase 21,818 shares of common stock upon his or her election to the board;
- each non-employee director receives an option to purchase 3,636 shares of common stock on the anniversary of his or her election to the board;
- each non-employee director receives $8,750 per calendar quarter; and
- each non-employee director who serves as chairperson of a committee of the board receives additional equity compensation as follows:
  - the chairperson of the audit committee receives an annual grant of an option to purchase 1,454 shares of common stock; and
  - the chairperson of each of the nominating and corporate governance committee and compensation committee receives an annual grant of an option to purchase 727 shares of common stock.

The stock options granted to our non-employee directors have an exercise price equal to the fair market value of our common stock on the date of grant, expire ten years after the date of grant, and are subject to the director's continued service on our board.

To the extent that a non-employee director has other responsibilities, such director may receive additional compensation to the extent as deemed necessary by our board of directors.

Each member of our board of directors receives reimbursement for reasonable travel and other expenses incurred in connection with attending meetings of the board of directors, consistent with our employee travel expense reimbursement guidelines. Pursuant to a consulting agreement, Dr. Cantley serves as a special scientific consultant to us, with a commitment of one day per week, for which he is paid $175,000 annually. See "Certain relationships and related person transactions—Cantley consulting agreement."

Limitation of liability and indemnification

Our certificate of incorporation, which will become effective upon the closing of this offering, limits the personal liability of directors for breach of fiduciary duty to the maximum extent permitted by the Delaware General Corporation Law and provides that no director will have personal liability to us or to our stockholders for monetary damages for breach of fiduciary duty or other duty as a director. However, these provisions do not eliminate or limit the liability of any of our directors:

- for any breach of the director's duty of loyalty to us or our stockholders;
- for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law;
- for voting or assenting to unlawful payments of dividends, stock repurchases or other distributions; or
- for any transaction from which the director derived an improper personal benefit.

Any amendment to or repeal of these provisions will not eliminate or reduce the effect of these provisions in respect of any act, omission or claim that occurred or arose prior to such amendment or repeal. If the Delaware General Corporation Law is amended to provide for further limitations on the personal liability of directors of corporations, then the personal liability of our directors will be further limited to the greatest extent permitted by the Delaware General Corporation Law.

In addition, our certificate of incorporation, which will become effective upon the closing of this offering, provides that we must indemnify our directors and officers and we must advance expenses, including attorneys' fees, to our directors and officers in connection with legal proceedings, subject to very limited exceptions.

We maintain a general liability insurance policy that covers certain liabilities of our directors and officers arising out of claims based on acts or omissions in their capacities as directors or officers. In addition, we have entered into indemnification agreements with our directors and executive officers. These indemnification agreements require us, among other things, to indemnify each such director and executive officer for some expenses, including attorneys' fees, judgments, fines and settlement amounts incurred by him in any action or proceeding arising out of his service as one of our directors or executive officers.

Certain of our non-employee directors may, through their relationships with their employers, be insured and/or indemnified against certain liabilities incurred in their capacity as members of our board of directors.

Insofar as indemnification for liabilities arising under the Securities Act of 1933, as amended, or the Securities Act, may be permitted to directors, executive officers or persons controlling us, in the opinion of the SEC, such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

Certain relationships and related person transactions

Since January 1, 2010, we have engaged in the following transactions with our directors and executive officers and holders of more than 5% of our voting securities, and affiliates of our directors, executive officers and 5% stockholders. We believe that all of the transactions described below were made on terms no less favorable to us than could have been obtained from unaffiliated third parties.

Collaboration with Celgene, series B convertible preferred stock financing and concurrent private placement

In April 2010, we entered into a collaboration agreement with Celgene Corporation. In October 2011, we amended this collaboration agreement. See "Business—Collaboration with Celgene." Pursuant to the collaboration, we received an upfront payment of $121.2 million in April 2010 and a payment of $20.0 million in October 2011 in consideration of entering into an amendment to extend the discovery phase of the agreement.

Simultaneously with entering into the collaboration agreement, in April 2010, we issued and sold 5,190,551 shares of our series B convertible preferred stock to Celgene at a purchase price per share of $1.70 for an aggregate purchase price of $8.8 million. In connection with such sale of shares of our series B preferred stock to Celgene, we were granted the right to require Celgene to purchase, either in our initial public offering or, at our determination, in a concurrent private placement, at a per share purchase price equal to the public offering price, a number of shares of our common stock having an aggregate purchase price equal to the lesser of 10% of the total gross proceeds for the shares sold in the public offering or $10 million. If we do not exercise this option to issue and sell the shares to Celgene, then Celgene has the right to elect to purchase, at a per share purchase price equal to the public offering price, a number of shares of our common stock having an aggregate purchase price equal to 10% of the total gross proceeds for the shares sold in the public offering.

An affiliate of Celgene has agreed to purchase $12.75 million of our common stock in a private placement concurrent with this offering at a price per share equal to the initial public offering price. The sale of such shares of common stock are being issued pursuant to Section 4(2) under the Securities Act relating to transactions not involving any public offering, and will not be registered under the Securities Act. The closing of the offering to which this prospectus relates is not conditioned upon the closing of the concurrent private placement.

After giving effect to the sale of (i) shares of series B preferred stock to Celgene as described herein, (ii) shares of series C-2 preferred stock to an affiliate of Celgene, as further described below, (iii) shares to an affiliate of Celgene in the concurrent private placement and (iv) shares to the public in this offering, Celgene will be the beneficial owner of 15.7% of our outstanding common stock.

Perry Karsen, a member of our board of directors, is an executive vice president of Celgene Corporation.

Series C-1 convertible preferred stock and series C-2 convertible preferred stock financing

During November 2011, we issued and sold an aggregate of 7,395,829 shares of our series C-1 convertible preferred stock and 8,486,560 shares of our series C-2 convertible preferred stock, each at a purchase price per share of $4.9111, for an aggregate purchase price of approximately $78.0 million.

The following table sets forth the number of shares of series C-1 convertible preferred stock or series C-2 convertible preferred stock that were issued to holders of more than 5% of our voting securities and their affiliates in connection with the series C-1 convertible preferred stock and series C-2 convertible preferred stock financing and the aggregate cash purchase price paid by such entities.

Purchaser(1)	Shares of series C-1 convertible preferred stock	Shares of series C-2 convertible preferred stock	Purchase price
ARCH Venture Fund VII, L.P.(2)	—	617,031	$ 3,030,301
Flagship Ventures Fund 2007, L.P.(3)	—	617,031	$ 3,030,301
Third Rock Ventures, L.P.(4)	—	802,141	$ 3,939,395
Entities affiliated with Fidelity Management & Research Company(5)	6,377,730	—	$ 31,321,670
Celgene European Investment Company LLC(6)	—	5,839,496	$28,678,349

(1) See “Principal stockholders” for more information about shares held by these entities.

(2) Robert T. Nelsen, a member of our board of directors, is a managing director of ARCH Venture Partners VII, LLC, the sole general partner of ARCH Venture Partners VII, L.P., the sole general partner of ARCH Venture Fund VII, L.P.

(3) Douglas Cole, a member of our board of directors, is a member of Flagship Ventures 2007 General Partner LLC, the sole general partner of Flagship Ventures Fund 2007 L.P. (the “Fund”). Dr. Cole does not have either voting or investment control over the Fund’s shares and he disclaims beneficial ownership of the Fund’s shares, except to the extent of his pecuniary interest therein. Dr. Cole does not own shares in his individual capacity.

(4) Kevin Starr, a member of our board of directors, is a partner of Third Rock Ventures. Mr. Starr may be deemed to have voting and investment power over the shares held by Third Rock Ventures, L.P. Mr. Starr disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein.

(5) Consists of (a) 50,916 shares of series C-1 convertible preferred stock purchased by Fidelity Select Portfolios: Pharmaceuticals Portfolio, (b) 229,509 shares of series C-1 convertible preferred stock purchased by Fidelity Select Portfolios: Biotechnology Portfolio, (c) 13,990 shares of series C-1 convertible preferred stock purchased by Fidelity Advisor Series VII: Fidelity Advisor Biotechnology Fund, (d) 2,036,659 shares of series C-1 convertible preferred stock purchased by Fidelity Mt. Vernon Street Trust: Fidelity Growth Company Fund, (e) 3,363,446 shares of series C-1 convertible preferred stock purchased by Fidelity Contrafund: Fidelity Advisor New Insights Fund, (f) 353,944 shares of series C-1 convertible preferred stock purchased by Fidelity Securities Fund: Fidelity Small Cap Opportunities Fund, and (g) 329,266 shares of series C-1 convertible preferred stock purchased by Fidelity Capital Trust: Fidelity Small Cap Independence Fund.

(6) Perry Karsen, a member of our board of directors, is an executive vice president of Celgene Corporation, the parent corporation of Celgene European Investment Company LLC.

Registration rights

We are a party to a second amended and restated investor rights agreement with holders of our series A convertible preferred stock, series B convertible preferred stock, series C-1 convertible preferred stock and series C-2 convertible preferred stock, including some of our directors, executive officers and 5% stockholders and their affiliates and entities affiliated with our directors. The investor rights agreement provides these holders the right, following the completion of this offering, to demand that we file a registration statement or request that their shares be covered by a registration statement that we are otherwise filing. An affiliate of Celgene will also be entitled to registration rights with respect to shares of our common stock purchased by it in the concurrent private placement. See “Description of capital stock—Registration rights” for additional information regarding these registration rights.

Severance and change in control agreements

See the "Executive compensation—Employment, severance and change in control arrangements" section of this prospectus for a further discussion of these arrangements.

Schenkein loan

In August 2009, we lent $500,000 to David Schenkein, M.D., our chief executive officer and a member of our board of directors, to assist with his relocation expenses in connection with the commencement of Dr. Schenkein's employment with us. The principal and interest under such loan was repaid in full in November 2010.

Cantley consulting agreement

In July 2010, we entered into a consulting agreement with Lewis C. Cantley, Ph.D., a member of our board of directors, under which Dr. Cantley is paid $175,000 annually to serve as a special scientific consultant to us, with a commitment of one day per week.

Foundation Medicine

In March 2013, we entered into a master services agreement with Foundation Medicine. Under that agreement, Foundation Medicine has agreed, on a non-exclusive basis, to provide mutation analysis for the clinical trials in our IDH1 and IDH2 programs. Nothing has been paid to date under this agreement, and we do not expect to incur meaningful costs under this agreement until 2014. Dr. Schenkein, our chief executive officer and a director, is a director of Foundation Medicine.

Indemnification of officers and directors

Our certificate of incorporation that will be effective as of the closing date of this offering provides that we will indemnify our directors and officers to the fullest extent permitted by Delaware law. In addition, we have entered into indemnification agreements with each of our directors and executive officers that may be broader in scope than the specific indemnification provisions contained in the Delaware General Corporation Law. See the "Executive compensation —Limitation of liability and indemnification" section of this prospectus for a further discussion of these arrangements.

Policies and procedures for related person transactions

In June 2013, our board of directors adopted written policies and procedures for the review of any transaction, arrangement or relationship in which we are a participant, the amount involved exceeds $120,000, and one of our executive officers, directors, director nominees or 5% stockholders (or their immediate family members), each of whom we refer to as a "related person," has a direct or indirect material interest.

If a related person proposes to enter into such a transaction, arrangement or relationship, which we refer to as a "related person transaction," the related person must report the proposed related person transaction to our principal financial officer. The policy calls for the proposed related person transaction to be reviewed and, if deemed appropriate, approved by the audit committee. Whenever practicable, the reporting, review and approval will occur prior to entry into the transaction. If advance review and approval is not practicable, the committee will review, and, in its discretion, may ratify the related person transaction. The policy also permits the chairman of the committee to review and, if deemed appropriate, approve proposed related person transactions that arise between committee meetings, subject to ratification by the committee at its next meeting. Any related person transactions that are ongoing in nature will be reviewed annually.

A related person transaction reviewed under the policy will be considered approved or ratified if it is authorized by the committee after full disclosure of the related person's interest in the transaction. As appropriate for the circumstances, the committee will review and consider:

- the related person's interest in the related person transaction;
- the approximate dollar value of the amount involved in the related person transaction;
- the approximate dollar value of the amount of the related person's interest in the transaction without regard to the amount of any profit or loss;
- whether the transaction was undertaken in the ordinary course of our business;
- whether the terms of the transaction are no less favorable to us than terms that could have been reached with an unrelated third party;
- the purpose of, and the potential benefits to us of, the transaction; and
- any other information regarding the related person transaction or the related person in the context of the proposed transaction that would be material to investors in light of the circumstances of the particular transaction.

The committee may approve or ratify the transaction only if the committee determines that, under all of the circumstances, the transaction is in or is not inconsistent with our best interests. The committee may impose any conditions on the related person transaction that it deems appropriate.

In addition to the transactions that are excluded by the instructions to the SEC's related person transaction disclosure rule, our board of directors has determined that the following transactions do not create a material direct or indirect interest on behalf of related persons and, therefore, are not related person transactions for purposes of this policy:

- interests arising solely from the related person's position as an executive officer of another entity (whether or not the person is also a director of such entity), that is a participant in the transaction, where (a) the related person and all other related persons own in the aggregate less than a 10% equity interest in such entity, (b) the related person and his or her immediate family members are not involved in the negotiation of the terms of the transaction and do not receive any special benefits as a result of the transaction, (c) the amount involved in the transaction equals less than the greater of $1 million dollars or 2% of the annual consolidated gross revenues of the other entity that is a party to the transaction, and (d) the amount involved in the transaction equals less than 2% of our annual consolidated gross revenues; and
- a transaction that is specifically contemplated by provisions of our charter or bylaws.

The policy provides that transactions involving compensation of executive officers shall be reviewed and approved by the compensation committee in the manner specified in its charter.

Principal stockholders

The following table sets forth information with respect to the beneficial ownership of our common stock, as of May 31, 2013 by:

- each person known by us to beneficially own more than 5% of our common stock;
- each of our directors;
- each of our named executive officers; and
- all of our executive officers and directors as a group.

The column entitled "Shares beneficially owned prior to offering—Percentage" is based on a total of 23,530,399 shares of our common stock outstanding as of May 31, 2013, assuming the automatic conversion of all outstanding shares of our preferred stock into an aggregate of 19,731,564 shares of our common stock upon the closing of this offering. The column entitled "Shares beneficially owned after offering—Percentage" is based on shares of our common stock to be outstanding after this offering, including the shares of our common stock that we are selling in this offering and the shares of our common stock that we are selling to an affiliate of Celgene in the concurrent private placement, but not including any additional shares issuable upon exercise of outstanding options.

The number of shares beneficially owned by each stockholder is determined under rules issued by the Securities and Exchange Commission and includes voting or investment power with respect to securities. Under these rules, beneficial ownership includes any shares as to which the individual or entity has sole or shared voting power or investment power. In computing the number of shares beneficially owned by an individual or entity and the percentage ownership of that person, shares of common stock subject to options or other rights held by such person that are currently exercisable or will become exercisable within 60 days as of May 31, 2013 are considered outstanding, although these shares are not considered outstanding for purposes of computing the percentage ownership of any other person. Unless otherwise indicated, the address of all listed stockholders is c/o Agios Pharmaceuticals, Inc., 38 Sidney Street, 2 nd Floor, Cambridge, MA 02139. Each of the stockholders listed has sole voting and investment power with respect to the shares beneficially owned by the stockholder unless noted otherwise, subject to community property laws where applicable.

	Shares beneficially owned prior to offering		Shares beneficially owned after offering	
Name of beneficial owner	Number	Percentage	Number	Percentage
5% stockholders				
Third Rock Ventures, L.P.(1)	5,564,413	23.65%	5,564,413	18.47%
Entities affiliated with Celgene Corporation(2)	4,010,926	17.05%	4,719,259	15.66%
ARCH Venture Fund VII, L.P.(3)	3,860,736	16.41%	3,860,736	12.81%
Flagship Ventures Fund 2007, L.P.(4)	3,860,736	16.41%	3,860,736	12.81%
Entities affiliated with Fidelity Management & Research Company(5)	2,319,171	9.86%	2,319,171	7.70%
Named executive officers and directors				
David P. Schenkein, M.D.(6)	1,009,771	4.18%	1,009,771	3.28%
Duncan Higgons(7)	453,084	1.90%	453,084	1.49%
Scott Biller, Ph.D.(8)	178,454	*	178,454	*
Glenn Goddard(9)	46,362	*	46,362	*
Lewis C. Cantley, Ph.D.(10)	486,362	2.06%	486,362	1.61%

Name of beneficial owner	Shares beneficially owned prior to offering		Shares beneficially owned after offering	
	Number	Percentage	Number	Percentage
Douglas G. Cole, M.D.(11)	—	—	—	—
Perry Karsen(12)	—	—	—	—
John M. Maraganore, Ph.D.	36,000	*	36,000	*
Robert T. Nelsen(13)	3,860,736	16.41%	3,860,736	12.81%
Kevin P. Starr(14)	5,564,413	23.65%	5,564,413	18.47%
Marc Tessier-Lavigne, Ph.D.	45,454	*	45,454	*
All executive officers and directors as a group (11 persons)(15)	11,680,636	46.99%	11,680,636	37.14%

* Less than 1%.

(1) Consists of (a) 4,727,272 shares of common stock issuable upon conversion of series A convertible preferred stock held by Third Rock Ventures, L.P. ("TRV LP"), (b) 291,687 shares of common stock issuable upon conversion of series C-2 convertible preferred stock held by TRV LP, and (c) 545,454 shares of common stock held by TRV LP. Each of Third Rock Ventures GP, LP ("TRV GP"), the general partner of TRV LP, and Third Rock Ventures GP, LLC ("TRV LLC"), the general partner of TRV GP, may be deemed to have voting and dispositive power over the shares held by TRV LP. Investment decisions with respect to the shares held by TRV LP are made by an investment committee at TRV GP comprised of Mark Levin, Kevin Starr, Bob Tepper, Neil Exter, Kevin Gillis, Lou Tartaglia, Craig Muir, Cary Pfeffer, Alexis Borisy and Craig Greaves. No stockholder, director, officer, manager, member or employee of TRV GP or TRV LLC has beneficial ownership (within the meaning of Rule 13d-3 promulgated under the Exchange Act) of any shares held by TRV LP. Mr. Starr, a member of our board of directors, is a partner of TRV LP and may be deemed to have voting and investment power over the shares held by TRV LP. Mr. Starr disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. The address of TRV LP is 29 Newbury Street, Suite 401, Boston, MA 02142.

(2) Consists of (a) 1,887,473 shares of common stock issuable upon conversion of series B convertible preferred stock held by Celgene European Investment Company LLC ("Celgene LLC"), and (b) 2,123,453 shares of common stock issuable upon conversion of series C-2 convertible preferred stock held by Celgene LLC. The number of shares beneficially owned after the offering also includes shares issuable in the concurrent private placement of $12.75 million of our common stock to Celgene Alpine Investment Co., LLC ("Celgene Alpine LLC") at the completion of this offering at the public offering price of $18.00 per share. Celgene LLC and Celgene Alpine LLC are wholly-owned subsidiaries of Celgene. The address for Celgene is 86 Morris Avenue, Summit, NJ 07901.

(3) Consists of (a) 3,636,362 shares of common stock issuable upon conversion of series A convertible preferred stock held by ARCH Venture Fund VII, L.P. ("ARCH VII"), and (b) 224,374 shares of common stock issuable upon conversion of series C-2 convertible preferred stock held by ARCH VII. ARCH Venture Partners VII, L.P. (the "GPLP"), as the sole general partner of ARCH VII and may be deemed to beneficially own certain of the shares held by ARCH VII. The GPLP disclaims beneficial ownership of all shares held by ARCH VII in which the GPLP does not have an actual pecuniary interest. ARCH Venture Partners VII, LLC (the "GPLLC"), as the sole general partner of the GPLP, may be deemed to beneficially own certain of the shares held by ARCH VII. The GPLLC disclaims beneficial ownership of all shares held by ARCH VII in which it does not have an actual pecuniary interest. The managing directors of the GPLLC, Robert T. Nelsen, Keith Crandell and Clinton Bybee (together, the "Managing Directors"), are deemed to have voting and dispositive power over the shares held by ARCH VII, and may be deemed to beneficially own certain of the shares held by ARCH VII. Mr. Nelsen, a member of our board of directors is one of the Managing Directors. The Managing Directors disclaim beneficial ownership of all shares held by ARCH VII in which they do not have an actual pecuniary interest. The address for ARCH VII is 8725 West Higgins Road, Suite 290, Chicago, IL 60631.

(4) Consists of (a) 3,636,362 shares of common stock issuable upon conversion of series A convertible preferred stock held by Flagship Ventures Fund 2007, L.P. ("Flagship 2007"), and (b) 224,374 shares of common stock issuable upon conversion of series C-2 convertible preferred stock held by Flagship 2007. Flagship Ventures 2007 General Partner, LLC ("Flagship 2007 LLC") is the general partner of Flagship 2007 and Noubar B. Afeyan Ph.D. and Edwin M. Kania, Jr. are the managers of Flagship 2007 LLC. Flagship 2007 LLC, Dr. Afeyan and Mr. Kania may be deemed to share voting and investment power with respect to all shares held by Flagship 2007. Flagship 2007 LLC, Dr. Afeyan and Mr. Kania expressly disclaim beneficial ownership of the securities listed above except to the extent of any pecuniary interest therein. Douglas G. Cole, M.D., a member of our board of directors, is a member of Flagship 2007 LLC, the sole general partner of Flagship 2007. Dr. Cole does not have either voting or investment control over Flagship 2007's shares and he disclaims beneficial ownership of Flagship 2007's shares, except to the extent of his pecuniary interest therein. The address for Flagship 2007 is One Memorial Drive, 7th Floor, Cambridge, MA 02142.

(5) Consists of (a) 18,514 shares of common stock issuable upon conversion of series C-1 convertible preferred stock held by Fidelity Select Portfolios: Pharmaceuticals Portfolio, (b) 83,457 shares of common stock issuable upon conversion of series C-1 convertible preferred stock held by Fidelity Select Portfolios: Biotechnology Portfolio, (c) 5,087 shares of common stock issuable upon conversion of series C-1 convertible preferred stock held by Fidelity Advisor Series VII: Fidelity Advisor Biotechnology Fund, (d) 740,603 shares of common stock issuable upon conversion of series C-1 convertible preferred stock held by Fidelity Mt. Vernon Street Trust: Fidelity Growth Company Fund, (e) 1,223,071 shares of common stock issuable upon conversion of series C-1 convertible preferred stock held by Fidelity Contrafund: Fidelity Advisor New Insights Fund, (f) 128,706 shares of common stock issuable upon conversion of series C-1 convertible preferred stock held by Fidelity Securities Fund: Fidelity Series Small Cap Opportunities Fund, and (g) 119,733 shares of common stock issuable upon conversion of series C-1 convertible preferred stock held by Fidelity Capital Trust: Fidelity Stock Selector Small Cap Fund. Fidelity Management & Research Company ("Fidelity") a wholly-owned subsidiary of FMR LLC and an investment adviser registered under Section 203 of the Investment Advisers Act of 1940, is the beneficial owner of 2,319,171 shares of series C-1 convertible preferred stock as a result of acting as investment adviser to various investment companies registered under Section 8 of the Investment Company Act of 1940. Edward C. Johnson 3d and FMR LLC, through its control of Fidelity and the funds, each has sole power to dispose of the 6,377,730 shares owned by the funds. Members of the family of Edward C. Johnson 3d, chairman of FMR LLC, are the predominant owners, directly or through trusts, of Series B voting common shares of FMR LLC, representing 49% of the voting power of FMR LLC. The Johnson family group and all other Series B shareholders have entered into a shareholders' voting agreement under which all Series B voting common shares will be voted in accordance with the majority vote of Series B voting common shares. Accordingly, through their ownership of voting common shares and the execution of the shareholders' voting agreement, members of the Johnson family may be deemed, under the Investment Company Act of 1940, to form a controlling group with respect to FMR LLC. Neither FMR LLC nor Edward C. Johnson 3d, chairman of FMR LLC, has the sole power to vote or direct the voting of the shares owned directly by the Fidelity Funds, which power resides with the Funds' Boards of Trustees. Fidelity carries out the voting of the shares under written guidelines established by the Funds' Boards of Trustees. The address for Fidelity is 82 Devonshire Street, V13H, Boston, MA 02109.

(6) Consists of (a) 635,227 shares of common stock issuable upon the exercise of options exercisable within 60 days after May 31, 2013, (b) 187,272 shares of common stock held by the David P. Schenkein 2004 Revocable Trust, and (c) 187,272 shares of common stock held by the Amy P. Schenkein 2004 Revocable Trust, of which Amy P. Schenkein, Dr. Schenkein's wife, is trustee.

(7) Consists of (a) 343,994 shares of common stock issuable upon the exercise of options exercisable within 60 days after May 31, 2013 and (b) 109,090 shares of common stock.

(8) Consists of 178,454 shares of common stock issuable upon the exercise of options exercisable within 60 days after May 31, 2013.

(9) Consists of 46,362 shares of common stock issuable upon the exercise of options exercisable within 60 days after May 31, 2013.

(10) Includes 122,726 shares of common stock issuable upon the exercise of options exercisable within 60 days after May 31, 2013.
(11) Dr. Cole does not own shares in his individual capacity. He is a member of Flagship 2007 LLC, the sole general partner of Flagship 2007. Dr. Cole does not have either voting or investment control over Flagship 2007's shares and he disclaims beneficial ownership of Flagship 2007's shares, except to the extent of his pecuniary interest therein.
(12) Mr. Karsen does not own shares in his individual capacity. He is an executive vice president of Celgene. Celgene LLC and Celgene Alpine LLC are wholly-owned subsidiaries of Celgene. Mr. Karsen does not have either voting or investment control over Celgene LLC's or Celgene Alpine LLC's shares and he disclaims beneficial ownership of Celgene LLC's and Celgene Alpine LLC's shares, except to the extent of his pecuniary interest therein, if any.
(13) Consists of the shares described in note (3) above. Mr. Nelsen is a managing director of ARCH Venture Partners VII, LLC, which is the sole general partner of ARCH Venture Partners VII, L.P., which is the sole general partner of ARCH Venture Fund VII, L.P., and as such may be deemed to beneficially own such shares. Mr. Nelsen disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein.
(14) Consists of the shares described in note (1) above. Mr. Starr is a partner of Third Rock Ventures, L.P. and may be deemed to have voting and investment power over the shares held by Third Rock Ventures, L.P. Mr. Starr disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein.
(15) Includes 1,326,763 shares of common stock issuable upon the exercise of options exercisable within 60 days after May 31, 2013.

Description of capital stock

General

Following the closing of this offering, our authorized capital stock will consist of 125,000,000 shares of common stock, par value $0.001 per share, and 25,000,000 shares of preferred stock, par value $0.001 per share.

The following description of our capital stock and provisions of our certificate of incorporation and by-laws are summaries and are qualified by reference to the certificate of incorporation and by-laws that will become effective upon the closing of this offering. Copies of these documents have been filed with the Securities and Exchange Commission as exhibits to our registration statement, of which this prospectus forms a part. The description of our common stock reflects changes to our capital structure that will occur upon the closing of this offering.

As of May 31, 2013, we had issued and outstanding:

- 3,798,835 shares of our common stock held of record by 68 stockholders;
- 33,188,889 shares of our series A convertible preferred stock that are convertible into 12,068,682 shares of our common stock;
- 5,190,551 shares of our series B convertible preferred stock that are convertible into 1,887,473 shares of our common stock; and
- 15,882,389 shares of our series C convertible preferred stock that are convertible into 5,775,409 shares of our common stock, consisting of 7,395,829 shares of our series C-1 convertible preferred stock that are convertible into 2,689,388 shares of our common stock and 8,486,560 shares of our series C-2 convertible preferred stock that are convertible into 3,086,021 shares of our common stock.

Upon the closing of this offering, all of the outstanding shares of our preferred stock will automatically convert into an aggregate of 19,731,564 shares of our common stock.

Common stock

Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. An election of directors by our stockholders shall be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. Holders of common stock are entitled to receive proportionately any dividends as may be declared by our board of directors, subject to any preferential dividend rights of any series of preferred stock that we may designate and issue in the future.

In the event of our liquidation or dissolution, the holders of common stock are entitled to receive proportionately our net assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any outstanding preferred stock. Holders of common stock have no preemptive, subscription, redemption or conversion rights. Our outstanding shares of common stock are, and the shares offered by us in this offering will be, when issued and paid for, validly issued, fully paid and nonassessable. The rights, preferences and privileges of holders of common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Preferred stock

Under the terms of our certificate of incorporation that will become effective upon the closing of this offering, our board of directors is authorized to direct us to issue shares of preferred stock in one or more series without stockholder approval. Our board of directors has the discretion to determine the rights, preferences, privileges and restrictions, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation preferences, of each series of preferred stock.

The purpose of authorizing our board of directors to issue preferred stock and determine its rights and preferences is to eliminate delays associated with a stockholder vote on specific issuances. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions, future financings and other corporate purposes, could have the effect of making it more difficult for a third party to acquire, or could discourage a third party from seeking to acquire, a majority of our outstanding voting stock. Upon the closing of this offering, there will be no shares of preferred stock outstanding, and we have no present plans to issue any shares of preferred stock.

Options

As of May 31, 2013, options to purchase 3,695,065 shares of our common stock at a weighted average exercise price of $2.23 per share were outstanding.

Registration rights

We have entered into a second amended and restated investor rights agreement, dated November 16, 2011, which we refer to as the investor rights agreement, with certain holders of shares of our common stock and preferred stock. Upon the completion of this offering, holders of a total of 20,439,897 shares of our common stock will have the right to require us to register these shares under the Securities Act of 1933, as amended, or Securities Act, and to participate in future registrations of securities by us, under the circumstances described below. In addition, an affiliate of Celgene will also have these same registration rights with respect to shares acquired in the concurrent private placement. After registration pursuant to these rights, these shares will become freely tradable without restriction under the Securities Act. If not otherwise exercised, the rights described below will expire five years after the closing of this offering.

Demand registration rights

Beginning six months after the closing of this offering, subject to specified limitations set forth in the investor rights agreement, at any time, the holders of a majority of the then outstanding shares having rights under the investor rights agreement, which we refer to as registrable shares, may at any time demand in writing that we register all or a portion of the registrable shares under the Securities Act if the total amount of registrable shares registered have an aggregate offering price of at least $5 million (based on the then current market price). We are not obligated to file a registration statement pursuant to this provision on more than two occasions.

In addition, subject to specified limitations set forth in the investor rights agreement, at any time after we become eligible to file a registration statement on Form S-3, holders of at least 25% of the registrable shares then outstanding may request that we register their registrable securities on Form S-3 for purposes of a public offering if the total amount of registrable shares registered have an aggregate offering price of at least $5 million (based on the then current market price). We are not obligated to file a registration statement pursuant to this provision on more than two occasions in any 12-month period.

Incidental registration rights

If, at any time after the closing of this offering, we propose to file a registration statement to register any of our securities under the Securities Act, either for our own account or for the account of any of our stockholders, other than pursuant to the demand registration rights described above and other than pursuant to a Form S-4 or Form S-8, the holders of our registrable securities are entitled to notice of registration and, subject to specified exceptions, we will be required upon the holder’s request to use our best efforts to register their then held registrable securities.

In the event that any registration in which the holders of registrable shares participate pursuant to our investor rights agreement is an underwritten public offering, we agree to enter into an underwriting agreement containing customary representation and warranties and covenants, including without limitation customary provisions with respect to indemnification of the underwriters of such offering.

In the event that any registration in which the holders of registrable shares participate pursuant to our investor rights agreement is an underwritten public offering, we will use our best efforts to include the requested registrable shares to be included, but may be limited by market conditions.

Expenses

Pursuant to the investor rights agreement, we are required to pay all registration and filing fees, exchange listing fees, printing expenses, fees and expenses of one counsel to represent the selling stockholders, state Blue Sky fees and expenses, and the expense of any special audits incident to or required by any such registration, but excluding underwriting discounts, selling commissions and the fees and expenses of selling stockholders' own counsel (other than the counsel selected to represent all selling stockholders). We are not required to pay registration expenses if a demand registration request under the investor rights agreement is withdrawn at the request of holders who exercise their demand right to register the registrable securities, unless the withdrawal is due to discovery of a materially adverse change in our business.

The investor rights agreement contains customary cross-indemnification provisions, pursuant to which we are obligated to indemnify the selling stockholders in the event of material misstatements or omissions in the registration statement attributable to us, and they are obligated to indemnify us for material misstatements or omissions in the registration statement attributable to them.

Delaware anti-takeover law and certain charter and by-law provisions

Delaware law

We are subject to Section 203 of the Delaware General Corporation Law. Subject to certain exceptions, Section 203 prevents a publicly held Delaware corporation from engaging in a "business combination" with any "interested stockholder" for three years following the date that the person became an interested stockholder, unless the interested stockholder attained such status with the approval of our board of directors or unless the business combination is approved in a prescribed manner or the interested stockholder acquired at least 85% of our outstanding voting stock in the transaction in which it became an interested stockholder. A "business combination" includes, among other things, a merger or consolidation involving us and the "interested stockholder" and the sale of more than 10% of our assets. In general, an "interested stockholder" is any entity or person beneficially owning 15% or more of our outstanding voting stock and any entity or person affiliated with or controlling or controlled by such entity or person.

Staggered board; removal of directors

Our certificate of incorporation and our bylaws that will be effective following this offering divide our board of directors into three classes with staggered three-year terms. In addition, such certificate of incorporation and bylaws provide that a director may be removed only for cause and only by the affirmative vote of the holders of at least 75% of the votes that all our stockholders would be entitled to cast in an annual election of directors. Under our certificate of incorporation and bylaws, any vacancy on our board of directors, including a vacancy resulting from an enlargement of our board of directors, may be filled only by vote of a majority of our directors then in office. Furthermore, our certificate of incorporation provides that the authorized number of directors may be changed only by the resolution of our board of directors.

The classification of our board of directors and the limitations on the removal of directors and filling of vacancies could make it more difficult for a third party to acquire, or discourage a third party from seeking to acquire, control of our company.

Super-majority voting

The Delaware General Corporation Law provides generally that the affirmative vote of a majority of the shares entitled to vote on any matter is required to amend a corporation's certificate of incorporation or by-laws, unless a corporation's certificate of incorporation or by-laws, as the case may be, requires a greater percentage. Our by-laws may be amended or repealed by a majority vote of our board of directors or the affirmative vote of the holders of at least 75% of the votes that all our stockholders would be entitled to cast in an annual election of directors. In addition, the affirmative vote of the holders of at least 75% of the votes which all our stockholders would be entitled to cast in an election of directors is required to amend or repeal or to adopt any provisions inconsistent with any of the provisions of our certificate of incorporation described in the prior two paragraphs.

Stockholder action; special meeting of stockholders; advance notice requirements for stockholder proposals and director nominations

Our certificate of incorporation and our bylaws provide that any action required or permitted to be taken by our stockholders at an annual meeting or special meeting of stockholders may only be taken if it is properly brought before such meeting and may not be taken by written action in lieu of a meeting. Our certificate of incorporation and our bylaws also provide that, except as otherwise required by law, special meetings of the stockholders can only be called by our chairman of the board, our president or chief executive officer or our board of directors. In addition, our bylaws establish an advance notice procedure for stockholder proposals to be brought before an annual meeting of stockholders, including proposed nominations of candidates for election to our board of directors. Stockholders at an annual meeting may only consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of our board of directors, or by a stockholder of record on the record date for the meeting, who is entitled to vote at the meeting and who has delivered timely written notice in proper form to our secretary of the stockholder's intention to bring such business before the meeting. These provisions could have the effect of delaying until the next stockholder meeting stockholder actions that are favored by the holders of a majority of our outstanding voting securities. These provisions also could discourage a third party from making a tender offer for our common stock, because even if it acquired a majority of our outstanding voting stock, it would be able to take action as a stockholder, such as electing new directors or approving a merger, only at a duly called stockholders meeting and not by written consent.

Authorized but unissued shares

The authorized but unissued shares of common stock and preferred stock are available for future issuance without stockholder approval, subject to any limitations imposed by the listing standards of The NASDAQ Global Select Market. These additional shares may be used for a variety of corporate finance transactions, acquisitions and employee benefit plans. The existence of authorized but unissued and unreserved common stock and preferred stock could make more difficult or discourage an attempt to obtain control of us by means of a proxy contest, tender offer, merger or otherwise.

Transfer agent and registrar

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company, LLC.

The NASDAQ Global Select Market

Our common stock has been approved for listing on The NASDAQ Global Select Market under the symbol "AGIO."

Shares eligible for future sale

Immediately prior to this offering, there was no public market for our common stock. Future sales of substantial amounts of common stock in the public market, or the perception that such sales may occur, could adversely affect the market price of our common stock. Although our common stock has been approved for listing on The NASDAQ Global Select Market, we cannot assure you that there will be an active public market for our common stock.

Upon the closing of this offering and the concurrent private placement to an affiliate of Celgene, we will have outstanding an aggregate of 30,127,620 shares of common stock, assuming the issuance of 5,888,888 shares of common stock offered by us in this offering and 708,333 shares of common stock offered by us in the concurrent private placement and no exercise of options after May 31, 2013. Of these shares, all shares sold in this offering will be freely tradable without restriction or further registration under the Securities Act, except for any shares purchased by our "affiliates," as that term is defined in Rule 144 under the Securities Act, whose sales would be subject to the Rule 144 resale restrictions described below, other than the holding period requirement.

The remaining 24,238,732 shares of common stock will be "restricted securities," as that term is defined in Rule 144 under the Securities Act and will further be subject to either restrictions on transfer under the lock-up agreements described below or restrictions on transfer for a period of 180 days from the effectiveness of the registration statement of which this prospectus forms a part under stock option and restricted stock agreements entered into between us and the holders of those shares. Following the expiration of these restrictions, these shares will become eligible for public sale if they are registered under the Securities Act or if they qualify for an exemption from registration under Rules 144 or 701 under the Securities Act, which are summarized below. These restricted securities are eligible for public sale only if they are registered under the Securities Act or if they qualify for an exemption from registration under Rules 144 or 701 under the Securities Act, which are summarized below.

In addition, of the 3,695,065 shares of our common stock that were subject to stock options outstanding as of May 31, 2013, options to purchase 2,086,828 shares of common stock were vested as of May 31, 2013 and, upon exercise, these shares will be eligible for sale subject to the lock-up agreements described below and Rules 144 and 701 under the Securities Act.

Lock-up agreements

We and each of our directors and executive officers and holders of substantially all of our outstanding capital stock, who collectively own 23,092,943 shares of our common stock, based on shares outstanding as of May 31, 2013, have agreed that, without the prior written consent of J.P. Morgan Securities LLC and Goldman, Sachs & Co. on behalf of the underwriters, we and they will not, subject to limited exceptions, during the period ending 180 days after the date of this prospectus, subject to extension in specified circumstances:

- offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for our common stock, or publicly disclose the intention to make any offer, sale, pledge or disposition; or
- enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of the common stock or such other securities,

whether any transaction described above is to be settled by delivery of our common stock or such other securities, in cash or otherwise.

These agreements are subject to certain exceptions, and also subject to extensions for up to an additional 34 days, as described in the section of this prospectus entitled "Underwriting."

Upon the expiration of the applicable lock-up periods, substantially all of the shares subject to such lock-up restrictions will become eligible for sale, subject to the limitations discussed above.

Rule 144

Affiliate resales of restricted securities

In general, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is an affiliate of ours, or who was an affiliate at any time during the 90 days before a sale, who has beneficially owned shares of our common stock for at least six months would be entitled to sell in "broker's transactions" or certain "riskless principal transactions" or to market makers, a number of shares within any three-month period that does not exceed the greater of:

- 1% of the number of shares of our common stock then outstanding, which will equal approximately 301,276 shares immediately after this offering and the concurrent private placement; or
- the average weekly trading volume in our common stock on The NASDAQ Global Select Market during the four calendar weeks preceding the filing of a notice on Form 144 with respect to such sale.

Affiliate resales under Rule 144 are also subject to the availability of current public information about us. In addition, if the number of shares being sold under Rule 144 by an affiliate during any three-month period exceeds 5,000 shares or has an aggregate sale price in excess of $50,000, the seller must file a notice on Form 144 with the Securities and Exchange Commission and NASDAQ concurrently with either the placing of a sale order with the broker or the execution directly with a market maker.

Non-affiliate resales of restricted securities

In general, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is not an affiliate of ours at the time of sale, and has not been an affiliate at any time during the 90 days preceding a sale, and who has beneficially owned shares of our common stock for at least six months but less than a year, is entitled to sell such shares subject only to the availability of current public information about us. If such person has held our shares for at least one year, such person can resell under Rule 144(b)(1) without regard to any Rule 144 restrictions, including the 90-day public company requirement and the current public information requirement.

Non-affiliate resales are not subject to the manner of sale, volume limitation or notice filing provisions of Rule 144.

Rule 701

In general, under Rule 701, any of an issuer's employees, directors, officers, consultants or advisors who purchases shares from the issuer in connection with a compensatory stock or option plan or other written agreement before the effective date of a registration statement under the Securities Act is entitled to sell such shares 90 days after such effective date in reliance on Rule 144. An affiliate of the issuer can resell shares in reliance on Rule 144 without having to comply with the holding period requirement, and non-affiliates of the issuer can resell shares in reliance on Rule 144 without having to comply with the current public information and holding period requirements.

The Securities and Exchange Commission has indicated that Rule 701 will apply to typical stock options granted by an issuer before it becomes subject to the reporting requirements of the Exchange Act, along with the shares acquired upon exercise of such options, including exercises after an issuer becomes subject to the reporting requirements of the Exchange Act.

Equity plans

We intend to file one or more registration statements on Form S-8 under the Securities Act to register all shares of common stock subject to outstanding stock options and common stock issued or issuable under our stock plans. We expect to file the registration statement covering shares offered pursuant to our stock plans shortly

after the date of this prospectus, permitting the resale of such shares by nonaffiliates in the public market without restriction under the Securities Act and the sale by affiliates in the public market, subject to compliance with the resale provisions of Rule 144.

Registration rights

Upon the closing of this offering and the concurrent private placement, the holders of 20,439,897 shares of common stock or their transferees will be entitled to various rights with respect to the registration of these shares under the Securities Act. In addition, an affiliate of Celgene will also have the same registration rights with respect to shares acquired in the concurrent private placement. Registration of these shares under the Securities Act would result in these shares becoming fully tradable without restriction under the Securities Act immediately upon the effectiveness of the registration, except for shares purchased by affiliates. See “Description of Capital Stock—Registration Rights” for additional information. Shares covered by a registration statement will be eligible for sale in the public market upon the expiration or release from the terms of the lock-up agreement.

Material U.S. tax considerations for non-U.S. holders of common stock

The following is a general discussion of material U.S. federal income and estate tax considerations relating to the ownership and disposition of our common stock by a non-U.S. holder. For purposes of this discussion, the term "non-U.S. holder" means a beneficial owner of our common stock that is not, for U.S. federal income tax purposes:

- an individual who is a citizen or resident of the United States;
- a corporation, or other entity treated as a corporation for U.S. federal income tax purposes, created or organized in or under the laws of the United States or of any political subdivision of the United States;
- an estate the income of which is subject to U.S. federal income taxation regardless of its source; or
- a trust, if a U.S. court is able to exercise primary supervision over the administration of the trust and one or more U.S. persons have authority to control all substantial decisions of the trust or if the trust has a valid election to be treated as a U.S. person under applicable U.S. Treasury Regulations.

An individual may be treated as a resident instead of a nonresident of the United States in any calendar year for U.S. federal income tax purposes if the individual was present in the United States for at least 31 days in that calendar year and for an aggregate of at least 183 days during the three-year period ending with the current calendar year. For purposes of this calculation, all of the days present in the current year, one-third of the days present in the immediately preceding year and one-sixth of the days present in the second preceding year are counted. Residents are taxed for U.S. federal income tax purposes as if they were U.S. citizens.

This discussion is based on current provisions of the U.S. Internal Revenue Code of 1986, as amended, which we refer to as the Code, existing and proposed U.S. Treasury Regulations promulgated thereunder, current administrative rulings and judicial decisions, all as in effect as of the date of this prospectus and all of which are subject to change or to differing interpretation, possibly with retroactive effect. Any change could alter the tax consequences to non-U.S. holders described in this prospectus. In addition, the Internal Revenue Service, or the IRS, could challenge one or more of the tax consequences described in this prospectus.

We assume in this discussion that each non-U.S. holder holds shares of our common stock as a capital asset (generally, property held for investment). This discussion does not address all aspects of U.S. federal income and estate taxation that may be relevant to a particular non-U.S. holder in light of that non-U.S. holder's individual circumstances nor does it address any aspects of U.S. state, local or non-U.S. taxes. This discussion also does not consider any specific facts or circumstances that may apply to a non-U.S. holder and does not address the special tax rules applicable to particular non-U.S. holders, such as:

- insurance companies;
- tax-exempt organizations;
- financial institutions;
- brokers or dealers in securities;
- regulated investment companies;
- pension plans;
- controlled foreign corporations;
- passive foreign investment companies;
- owners that hold our common stock as part of a straddle, hedge, conversion transaction, synthetic security or other integrated investment; and
- certain U.S. expatriates.

In addition, this discussion does not address the tax treatment of partnerships or persons who hold their common stock through partnerships or other entities that are pass-through entities for U.S. federal income tax purposes. A partner in a partnership or other pass-through entity that will hold our common stock should consult his, her or its own tax advisor regarding the tax consequences of the ownership and disposition of our common stock through a partnership or other pass-through entity, as applicable.

Prospective investors should consult their own tax advisors regarding the U.S. federal, state, local and non-U.S. income and other tax considerations of acquiring, holding and disposing of our common stock.

Dividends

If we pay distributions on our common stock, those distributions generally will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. If a distribution exceeds our current and accumulated earnings and profits, the excess will be treated as a tax-free return of the non-U.S. holder's investment, up to such holder's tax basis in the common stock. Any remaining excess will be treated as capital gain, subject to the tax treatment described below under the heading "Gain on Disposition of Common Stock." Any such distribution made after December 31, 2013 will also be subject to the discussion below under the heading "Withholding and Information Reporting Requirements—FATCA."

Dividends paid to a non-U.S. holder generally will be subject to withholding of U.S. federal income tax at a 30% rate or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence. If we determine, at a time reasonably close to the date of payment of a distribution on our common stock, that the distribution will not constitute a dividend because we do not anticipate having current or accumulated earnings and profits, we intend not to treat such distribution as subject to withholding of any U.S. federal income tax as permitted by U.S. Treasury Regulations.

Dividends that are treated as effectively connected with a trade or business conducted by a non-U.S. holder within the United States, and, if an applicable income tax treaty so provides, that are attributable to a permanent establishment or a fixed base maintained by the non-U.S. holder within the United States, are generally exempt from the 30% withholding tax if the non-U.S. holder satisfies applicable certification and disclosure requirements. However, such U.S. effectively connected income, net of specified deductions and credits, is taxed at the same graduated U.S. federal income tax rates applicable to U.S. persons (as defined in the Code). Any U.S. effectively connected income received by a non-U.S. holder that is a corporation may also, under certain circumstances, be subject to an additional "branch profits tax" at a 30% rate or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence.

A non-U.S. holder of our common stock who claims the benefit of an applicable income tax treaty between the United States and such holder's country of residence generally will be required to provide a properly executed IRS Form W-8BEN (or successor form) and satisfy applicable certification and other requirements. Non-U.S holders are urged to consult their own tax advisors regarding their entitlement to benefits under a relevant income tax treaty.

A non-U.S. holder that is eligible for a reduced rate of U.S. withholding tax under an income tax treaty may obtain a refund or credit of any excess amounts withheld by timely filing an appropriate claim with the IRS.

Gain on disposition of common stock

A non-U.S. holder generally will not be subject to U.S. federal income tax on gain recognized on a disposition of our common stock unless:

- the gain is effectively connected with the non-U.S. holder's conduct of a trade or business in the United States, and, if an applicable income tax treaty so provides, the gain is attributable to a permanent establishment or fixed base maintained by the non-U.S. holder in the United States; in these cases, the non-

U.S. holder will be taxed on a net income basis at the regular graduated rates and in the manner applicable to U.S. persons, and, if the non-U.S. holder is a foreign corporation, an additional branch profits tax at a rate of 30%, or a lower rate as may be specified by an applicable income tax treaty, may also apply;

- the non-U.S. holder is an individual present in the United States for 183 days or more in the taxable year of the disposition and certain other requirements are met, in which case the non-U.S. holder will be subject to a 30% tax (or such lower rate as may be specified by an applicable income tax treaty) on the net gain derived from the disposition, which may be offset by U.S.—source capital losses of the non-U.S. holder, if any; or
- we are or have been, at any time during the five-year period preceding such disposition (or the non-U.S. holder's holding period, if shorter) a "U.S. real property holding corporation" unless our common stock is regularly traded on an established securities market and the non-U.S. holder held no more than 5% of our outstanding common stock, directly or indirectly, during the shorter of the 5-year period ending on the date of the disposition or the period that the non-U.S. holder held our common stock. Generally, a corporation is a "U.S. real property holding corporation" if the fair market value of its "U.S. real property interests" equals or exceeds 50% of the sum of the fair market value of its worldwide real property interests plus its other assets used or held for use in a trade or business. Although there can be no assurance, we believe that we are not currently, and we do not anticipate becoming, a "U.S. real property holding corporation" for U.S. federal income tax purposes. No assurance can be provided that our common stock will be regularly traded on an established securities market for purposes of the rule described above.

Information reporting and backup withholding

The gross amount of the distributions on our common stock paid to each non-U.S. holder and the tax withheld, if any, with respect to such distributions must be reported annually to the IRS. Non-U.S. holders may have to comply with specific certification procedures to establish that the holder is not a U.S. person (as defined in the Code) in order to avoid backup withholding at the applicable rate, currently 28%, with respect to dividends on our common stock. Generally, a holder will comply with such procedures if it provides a properly executed IRS Form W-8BEN (or other applicable Form W-8) or otherwise meets documentary evidence requirements for establishing that it is a non-U.S. holder, or otherwise establishes an exemption. Dividends paid to non-U.S. holders subject to withholding of U.S. federal income tax, as described above under the heading "Dividends," will generally be exempt from backup withholding.

Information reporting and backup withholding generally will apply to the proceeds of a disposition of our common stock by a non-U.S. holder effected by or through the U.S. office of any broker, U.S. or foreign, unless the holder certifies its status as a non-U.S. holder and satisfies certain other requirements, or otherwise establishes an exemption. Generally, information reporting and backup withholding will not apply to a payment of disposition proceeds to a non-U.S. holder where the transaction is effected outside the United States through a non-U.S. office of a broker. However, for information reporting purposes, dispositions effected through a non-U.S. office of a broker with substantial U.S. ownership or operations generally will be treated in a manner similar to dispositions effected through a U.S. office of a broker. Non-U.S. holders should consult their own tax advisors regarding the application of the information reporting and backup withholding rules to them.

Copies of information returns may be made available to the tax authorities of the country in which the non-U.S. holder resides or is incorporated under the provisions of a specific treaty or agreement.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules from a payment to a non-U.S. holder can be refunded or credited against the non-U.S. holder's U.S. federal income tax liability, if any, provided that an appropriate claim is timely filed with the IRS.

Withholding and information reporting requirements—FATCA

Recently enacted legislation (commonly referred to as "FATCA") will impose U.S. federal withholding tax of 30% on payments of dividends on, and gross proceeds from the sale or disposition of, our common stock if paid

to a foreign entity unless (i) in the case of a foreign entity that is a "foreign financial institution" (as defined under FATCA), the foreign entity undertakes certain due diligence, reporting, withholding, and certification obligations, (ii) in the case of a foreign entity that is not a foreign financial institution, the foreign entity identifies certain of its U.S. investors, or (iii) the foreign entity is otherwise exempt under FATCA. Although this legislation is effective with respect to amounts paid after December 31, 2012, under applicable U.S. Treasury Regulations, withholding under FATCA will only apply (1) to payments of dividends on our common stock made after December 31, 2013 and (2) to payments of gross proceeds from a sale or other disposition of our common stock made after December 31, 2016. Under certain circumstances, a non-U.S. holder may be eligible for refunds or credits of such taxes.

Prospective investors should consult their own tax advisors regarding the possible impact of the FATCA rules on their investment in our common stock and on the entities through which they hold our common stock including, without limitation, the process and deadlines for meeting the applicable requirements to prevent the imposition of the 30% withholding tax under FATCA.

Federal estate tax

Common stock owned or treated as owned by an individual (including by reason of holding interests in certain entities) who is a non-U.S. holder (as specially defined for U.S. federal estate tax purposes) at the time of death will be included in the individual's gross estate for U.S. federal estate tax purposes and, therefore, may be subject to U.S. federal estate tax, unless an applicable estate tax or other treaty provides otherwise.

The preceding discussion of material U.S. federal tax considerations is for general information only. It is not tax advice. Prospective investors should consult their own tax advisors regarding the particular U.S. federal, state, local and non-U.S. tax consequences of purchasing, holding and disposing of our common stock, including the consequences of any proposed changes in applicable laws.

Underwriting

We are offering the shares of common stock described in this prospectus through a number of underwriters. J.P. Morgan Securities LLC and Goldman, Sachs & Co. are acting as joint book-running managers of the offering and as representatives of the underwriters. We have entered into an underwriting agreement with the underwriters. Subject to the terms and conditions of the underwriting agreement, we have agreed to sell to the underwriters, and each underwriter has severally agreed to purchase, at the public offering price less the underwriting discounts and commissions set forth on the cover page of this prospectus, the number of shares of common stock listed next to its name in the following table:

Name	Number of shares
J.P. Morgan Securities LLC	2,355,555
Goldman, Sachs & Co.	2,061,111
Cowen and Company, LLC	736,111
Leerink Swann LLC	736,111
Total	5,888,888

The underwriters are committed to purchase all the common shares offered by us if they purchase any shares. The underwriting agreement also provides that if an underwriter defaults, the purchase commitments of non-defaulting underwriters may also be increased or the offering may be terminated.

The underwriters propose to offer the common shares directly to the public at the initial public offering price set forth on the cover page of this prospectus and to certain dealers at that price less a concession not in excess of $0.756 per share. After the initial public offering of the shares, the offering price and other selling terms may be changed by the underwriters. Sales of shares made outside of the United States may be made by affiliates of the underwriters. The representatives have advised us that the underwriters do not intend to confirm discretionary sales in excess of 5% of the common shares offered in this offering. The offering of the shares by the underwriters is subject to receipt and acceptance and subject to the underwriters' right to reject any order in whole or in part.

The underwriters have an option to buy up to 883,333 additional shares of common stock from us to cover sales of shares by the underwriters which exceed the number of shares specified in the table above. The underwriters have 30 days from the date of this prospectus to exercise this over-allotment option. If any shares are purchased with this over-allotment option, the underwriters will purchase shares in approximately the same proportion as shown in the table above. If any additional shares of common stock are purchased, the underwriters will offer the additional shares on the same terms as those on which the shares are being offered.

The underwriting fee is equal to the public offering price per share of common stock less the amount paid by the underwriters to us per share of common stock. The underwriting fee is $1.26 per share. The following table shows the per share and total underwriting discounts and commissions to be paid to the underwriters assuming both no exercise and full exercise of the underwriters' option to purchase additional shares.

	Without over-allotment exercise	With full over-allotment exercise
Per Share	$ 1.26	$ 1.26
Total	$7,419,999	$8,532,999

We estimate that the total expenses of this offering, including registration, filing and listing fees, printing fees and legal and accounting expenses, but excluding the underwriting discounts and commissions, will be approximately $2.3 million. We have agreed to reimburse the underwriters $27,000 for expenses related to any filing with, and the clearance of this offering by, the Financial Industry Regulatory Authority, Inc.

A prospectus in electronic format may be made available on the web sites maintained by one or more underwriters, or selling group members, if any, participating in the offering. The underwriters may agree to allocate a number of shares to underwriters and selling group members for sale to their online brokerage account holders. Internet distributions will be allocated by the representatives to underwriters and selling group members that may make Internet distributions on the same basis as other allocations.

We have agreed that we will not (i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase or otherwise transfer or dispose of, directly or indirectly, or file with the Securities and Exchange Commission a registration statement under the Securities Act relating to, any shares of our common stock or securities convertible into or exchangeable or exercisable for any shares of our common stock, or publicly disclose the intention to make any offer, sale, pledge, disposition or filing, or (ii) enter into any swap or other arrangement that transfers all or a portion of the economic consequences associated with the ownership of any shares of our common stock or any such other securities (regardless of whether any of these transactions are to be settled by the delivery of shares of our common stock or such other securities, in cash or otherwise), in each case without the prior written consent of J.P. Morgan Securities LLC and Goldman, Sachs & Co. for a period of 180 days after the date of this prospectus, other than (A) the shares of our common stock to be sold hereunder, (B) any shares of our common stock issued upon the exercise of options granted under company stock plans or warrants described as outstanding in this prospectus, (C) any options and other awards granted under company stock plans, (D) our filing of a registration statement on Form S-8 or a successor form thereto relating to the shares of our common stock granted pursuant to or reserved for issuance under company stock plans and (E) shares of our common stock or other securities issued in connection with a transaction that includes a commercial relationship (including joint ventures, marketing or distribution arrangements, collaboration agreements or intellectual property license agreements) or any acquisition of assets or not less than a majority or controlling portion of the equity of another entity; provided that the aggregate number of shares of our common stock issued pursuant to clause (E) shall not exceed 5.0% of the total number of outstanding shares of our common stock immediately following the issuance and sale of the underwritten shares pursuant to the underwriting agreement; provided, further, the recipient of any such shares of our common stock and securities issued pursuant to clauses (B), (C) or (E) during the 180-day restricted period described above shall enter into an agreement substantially in the form described below. Notwithstanding the foregoing, if (1) during the last 17 days of the 180-day restricted period, we issue an earnings release or material news or a material event relating to our company occurs; or (2) prior to the expiration of the 180-day restricted period, we announce that we will release earnings results during the 16-day period beginning on the last day of the 180-day restricted period, the restrictions described above shall continue to apply until the expiration of the 18-day period beginning on the issuance of the earnings release or the occurrence of the material news or material event.

Our directors and executive officers, and substantially all of our shareholders have entered into lock-up agreements with the underwriters prior to the commencement of this offering pursuant to which each of these persons or entities, for a period of 180 days after the date of this prospectus, may not, without the prior written consent of J.P. Morgan Securities LLC and Goldman, Sachs & Co., (1) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for our common stock (including, without limitation, common stock or such other securities which may be deemed to be beneficially owned by such directors, officers and shareholders in accordance with the rules and regulations of the SEC and securities which may be issued upon exercise of a stock option or warrant), or publicly disclose the intention to make any offer, sale, pledge or disposition, (2) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of our common stock or such other securities, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of our common stock or such other securities, in cash or otherwise or (3) make any demand for or exercise any right with respect to the registration of any shares of our common stock or any security convertible into or exercisable or exchangeable for our common stock, in each case subject to certain exceptions, including (A) transfers of shares of our common stock or other securities as

bona fide gifts, (B) transfers or dispositions of shares of our common stock or other securities to any trust for the direct or indirect benefit of the director, officer or shareholder or the immediate family of such person in a transaction not involving a disposition for value, (C) transfers or dispositions of shares of our common stock or other securities to any corporation, partnership, limited liability company or other entity all of the beneficial ownership interests of which are held by the director, officer or shareholder or the immediate family of such person in a transaction not involving a disposition for value, (D) transfers or dispositions of shares of our common stock or other securities by will, other testamentary document or intestate succession to the legal representative, heir, beneficiary or a member of the immediate family of the director, officer or shareholder, and (E) distributions of shares of our common stock or other securities to partners, members or stockholders of the shareholder. In the case of any transfer, disposition or distribution pursuant to clause (A), (B), (C), (D) or (E), each transferee, donee or distributee must execute and deliver to J.P. Morgan Securities LLC and Goldman, Sachs & Co. a lock-up agreement. In addition, in the case of any transfer, disposition or distribution pursuant to clause (A), (B), (C), (D) or (E), no filing by any party under the Exchange Act, or other public announcement may be required or voluntarily made in connection with such transfer, disposition or distribution, other than a filing on a Form 5 made after the expiration of the 180-day restricted period referred to above. In addition, notwithstanding the foregoing restrictions, the director, officer or shareholder may (i) transfer such person's shares of our common stock or any security convertible into or exercisable or exchangeable for our common stock to us pursuant to any contractual arrangement in effect on the date of the lock-up agreement that provides for the repurchase of such person's common stock or such other securities by us or in connection with such person's termination of employment with us, provided that no filing by any party under the Exchange Act, or other public announcement may be required or voluntarily made in connection with such transfer, other than a filing on a Form 5 made after the expiration of the 180-day restricted period referred to above, (ii) establish a trading plan pursuant to Rule 10b5-1 under the Exchange Act for the transfer of common stock, provided that such plan does not provide for any transfers of common stock, and no filing with the SEC or other public announcement shall be required or voluntarily made by the director, officer or shareholder or any other person in connection therewith, in each case during the 180-day restricted period or any extension thereof pursuant to the lock-up agreement, and (iii) transfer or dispose of shares of our common stock on the open market following the offering, provided that no filing by any party under the Exchange Act, or other public announcement reporting a reduction in the beneficial ownership of common stock held by the director, officer or shareholder may be required or voluntarily made in connection with such transfer, other than a filing on a Form 5 made after the expiration of the 180-day restricted period referred to above. Notwithstanding the foregoing, if (1) during the last 17 days of the 180-day restricted period, we issue an earnings release or material news or a material event relating to our company occurs; or (2) prior to the expiration of the 180-day restricted period, we announce that we will release earnings results during the 16-day period beginning on the last day of the 180-day restricted period, the restrictions described above shall continue to apply until the expiration of the 18-day period beginning on the issuance of the earnings release or the occurrence of the material news or material event.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act of 1933.

Our common stock has been approved for listing on The NASDAQ Global Select Market under the symbol "AGIO."

In connection with this offering, the underwriters may engage in stabilizing transactions, which involves making bids for, purchasing and selling shares of common stock in the open market for the purpose of preventing or retarding a decline in the market price of the common stock while this offering is in progress. These stabilizing transactions may include making short sales of the common stock, which involves the sale by the underwriters of a greater number of shares of common stock than they are required to purchase in this offering, and purchasing shares of common stock on the open market to cover positions created by short sales. Short sales may be "covered" shorts, which are short positions in an amount not greater than the underwriters' over-allotment option referred to above, or may be "naked" shorts, which are short positions in excess of that amount. The underwriters may close out any covered short position either by exercising their over-allotment option, in whole or in part, or

by purchasing shares in the open market. In making this determination, the underwriters will consider, among other things, the price of shares available for purchase in the open market compared to the price at which the underwriters may purchase shares through the over-allotment option. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the common stock in the open market that could adversely affect investors who purchase in this offering. To the extent that the underwriters create a naked short position, they will purchase shares in the open market to cover the position.

The underwriters have advised us that, pursuant to Regulation M of the Securities Act of 1933, they may also engage in other activities that stabilize, maintain or otherwise affect the price of the common stock, including the imposition of penalty bids. This means that if the representatives of the underwriters purchase common stock in the open market in stabilizing transactions or to cover short sales, the representatives can require the underwriters that sold those shares as part of this offering to repay the underwriting discount received by them.

These activities may have the effect of raising or maintaining the market price of the common stock or preventing or retarding a decline in the market price of the common stock, and, as a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. If the underwriters commence these activities, they may discontinue them at any time. The underwriters may carry out these transactions on The NASDAQ Global Select Market, in the over-the-counter market or otherwise.

Prior to this offering, there has been no public market for our common stock. The initial public offering price will be determined by negotiations between us and the representatives of the underwriters. In determining the initial public offering price, we and the representatives of the underwriters expect to consider a number of factors including:

- the information set forth in this prospectus and otherwise available to the representatives;
- our prospects and the history and prospects for the industry in which we compete;
- an assessment of our management;
- our prospects for future earnings;
- the general condition of the securities markets at the time of this offering;
- the recent market prices of, and demand for, publicly traded common stock of generally comparable companies; and
- other factors deemed relevant by the underwriters and us.

Neither we nor the underwriters can assure investors that an active trading market will develop for our shares of common stock, or that the shares will trade in the public market at or above the initial public offering price.

The underwriters and their respective affiliates are full-service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, investment research, principal investment, hedging, financing and brokerage activities. Certain of the underwriters and their affiliates have provided in the past to us and our affiliates and may provide from time to time in the future certain commercial banking, financial advisory, investment banking and other services for us and such affiliates in the ordinary course of their business, for which they have received and may continue to receive customary fees and commissions. In addition, in the ordinary course of their various business activities, the underwriters and their respective affiliates, officers, directors and employees may purchase, sell or hold a broad array of investments and actively trade securities, derivatives, loans, commodities, currencies, credit default swaps and other financial instruments for their own account and for the accounts of their customers, and such investment and trading activities may involve or relate to our assets, securities and/or instruments (directly, as collateral securing other obligations or otherwise) and/or persons and entities with relationships with us. The underwriters and their respective affiliates may also communicate independent investment recommendations,

market color or trading ideas and/or publish or express independent research views in respect of such assets, securities or instruments and may at any time hold, or recommend to clients that they should acquire, long and/or short positions in such assets, securities and instruments.

Selling restrictions

General

Other than in the United States, no action has been taken by us or the underwriters that would permit a public offering of the securities offered by this prospectus in any jurisdiction where action for that purpose is required. The securities offered by this prospectus may not be offered or sold, directly or indirectly, nor may this prospectus or any other offering material or advertisements in connection with the offer and sale of any such securities be distributed or published in any jurisdiction, except under circumstances that will result in compliance with the applicable rules and regulations of that jurisdiction. Persons into whose possession this prospectus comes are advised to inform themselves about and to observe any restrictions relating to the offering and the distribution of this prospectus. This prospectus does not constitute an offer to sell or a solicitation of an offer to buy any securities offered by this prospectus in any jurisdiction in which such an offer or a solicitation is unlawful.

United Kingdom

Each underwriter has represented and agreed that:

(1) it has only communicated or caused to be communicated and will only communicate or cause to be communicated an invitation or inducement to engage in investment activity (within the meaning of Section 21 of the FSMA) received by it in connection with the issue or sale of our common shares in circumstances in which Section 21(1) of the FSMA does not apply to us; and

(2) it has complied and will comply with all applicable provisions of the FSMA with respect to anything done by it in relation to our common shares in, from or otherwise involving the United Kingdom.

European Economic Area

In relation to each Member State of the European Economic Area which has implemented the Prospectus Directive (each, a "Relevant Member State"), an offer to the public of any shares which are the subject of the offering contemplated by this prospectus (the "Shares") may not be made in that Relevant Member State, except that an offer to the public in that Relevant Member State of any Shares may be made at any time under the following exemptions under the Prospectus Directive, if they have been implemented in that Relevant Member State:

(1) to any legal entity which is a qualified investor as defined in the Prospectus Directive;

(2) to fewer than 100 or, if the Relevant Member State has implemented the relevant provision of the 2010 PD Amending Directive, 150, natural or legal persons (other than qualified investors as defined in the Prospectus Directive), as permitted under the Prospectus Directive, subject to obtaining the prior consent of the representatives for any such offer; or

(3) in any other circumstances falling within Article 3(2) of the Prospectus Directive,

provided that no such offer of Shares shall result in a requirement for the publication by us or any underwriter of a prospectus pursuant to Article 3 of the Prospectus Directive.

For the purposes of this provision, the expression an "offer to the public" in relation to any Shares in any Relevant Member State means the communication in any form and by any means of sufficient information on the

terms of the offer and any Shares to be offered so as to enable an investor to decide to purchase any Shares, as the same may be varied in that Member State by any measure implementing the Prospectus Directive in that Member State, the expression "Prospectus Directive" means Directive 2003/71/EC (and amendments thereto, including the 2010 PD Amending Directive, to the extent implemented in the Relevant Member State), and includes any relevant implementing measure in the Relevant Member State, and the expression "2010 PD Amending Directive" means Directive 2010/73/EU.

Hong Kong

The shares may not be offered or sold by means of any document other than (i) in circumstances which do not constitute an offer to the public within the meaning of the Companies Ordinance (Cap.32, Laws of Hong Kong), or (ii) to "professional investors" within the meaning of the Securities and Futures Ordinance (Cap.571, Laws of Hong Kong) and any rules made thereunder, or (iii) in other circumstances which do not result in the document being a "prospectus" within the meaning of the Companies Ordinance (Cap.32, Laws of Hong Kong), and no advertisement, invitation or document relating to the shares may be issued or may be in the possession of any person for the purpose of issue (in each case whether in Hong Kong or elsewhere), which is directed at, or the contents of which are likely to be accessed or read by, the public in Hong Kong (except if permitted to do so under the laws of Hong Kong) other than with respect to shares which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" within the meaning of the Securities and Futures Ordinance (Cap. 571, Laws of Hong Kong) and any rules made thereunder.

Singapore

This prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the shares may not be circulated or distributed, nor may the shares be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than (i) to an institutional investor under Section 274 of the Securities and Futures Act, Chapter 289 of Singapore (the "SFA"), (ii) to a relevant person, or any person pursuant to Section 275(1A), and in accordance with the conditions, specified in Section 275 of the SFA or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the shares are subscribed or purchased under Section 275 by a relevant person which is: (a) a corporation (which is not an accredited investor) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or (b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary is an accredited investor, shares, debentures and units of shares and debentures of that corporation or the beneficiaries' rights and interest in that trust shall not be transferable for 6 months after that corporation or that trust has acquired the shares under Section 275 except: (1) to an institutional investor under Section 274 of the SFA or to a relevant person, or any person pursuant to Section 275(1A), and in accordance with the conditions, specified in Section 275 of the SFA; (2) where no consideration is given for the transfer; or (3) by operation of law.

Japan

The securities have not been and will not be registered under the Financial Instruments and Exchange Law of Japan (the Financial Instruments and Exchange Law) and each underwriter has agreed that it will not offer or sell any securities, directly or indirectly, in Japan or to, or for the benefit of, any resident of Japan (which term as used herein means any person resident in Japan, including any corporation or other entity organized under the laws of Japan), or to others for re-offering or resale, directly or indirectly, in Japan or to a resident of Japan, except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the Financial Instruments and Exchange Law and any other applicable laws, regulations and ministerial guidelines of Japan.

Legal matters

The validity of the shares of common stock offered hereby will be passed upon for us by Wilmer Cutler Pickering Hale and Dorr LLP, Boston, Massachusetts. Davis Polk & Wardwell LLP, New York, New York, has acted as counsel for the underwriters in connection with certain legal matters related to this offering.

Experts

Our consolidated financial statements as of December 31, 2011 and 2012, and for the years then ended, appearing in this prospectus and the related registration statement have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their report thereon appearing elsewhere herein, and are included in reliance on such report given on the authority of such firm as experts in accounting and auditing.

Where you can find more information

We have filed with the Securities and Exchange Commission a registration statement on Form S-1 under the Securities Act with respect to the shares of common stock offered hereby. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement or the exhibits and schedules filed therewith. For further information about us and the common stock offered hereby, we refer you to the registration statement and the exhibits and schedules filed thereto. Statements contained in this prospectus regarding the contents of any contract or any other document that is filed as an exhibit to the registration statement are not necessarily complete, and each such statement is qualified in all respects by reference to the full text of such contract or other document filed as an exhibit to the registration statement. Upon completion of this offering, we will be required to file periodic reports, proxy statements, and other information with the Securities and Exchange Commission pursuant to the Securities Exchange Act of 1934. You may read and copy this information at the Public Reference Room of the Securities and Exchange Commission, 100 F Street, N.E., Room 1580, Washington, D.C. 20549. You may obtain information on the operation of the public reference rooms by calling the Securities and Exchange Commission at 1-800-SEC-0330. The Securities and Exchange Commission also maintains an Internet website that contains reports, proxy statements and other information about registrants, like us, that file electronically with the Securities and Exchange Commission. The address of that site is *www.sec.gov*.

Agios Pharmaceuticals, Inc.

Index to Consolidated Financial Statements

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders
Agios Pharmaceuticals, Inc.

We have audited the accompanying consolidated balance sheets of Agios Pharmaceuticals, Inc. (the "Company") as of December 31, 2011 and 2012, and the related consolidated statements of operations, comprehensive loss, convertible preferred stock and stockholders' deficit, and cash flows for the years then ended. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. We were not engaged to perform an audit of the Company's internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Agios Pharmaceuticals, Inc. at December 31, 2011 and 2012, and the consolidated results of its operations and its cash flows for the years then ended in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP

Boston, Massachusetts
May 23, 2013, except for Note 12b, as to which the date is July 11, 2013

Agios Pharmaceuticals, Inc.

Consolidated Balance Sheets
(in thousands, except share and per share data)

	December 31, 2011	December 31, 2012	March 31, 2013	Pro forma March 31, 2013
			(unaudited)	
Assets				
Current assets:				
Cash and cash equivalents	$ 117,661	$ 91,297	$ 83,377	$ 83,377
Marketable securities	61,507	36,679	32,374	32,374
Prepaid expenses and other current assets	794	922	1,350	1,350
Deferred tax assets	10,623	1,246	1,246	1,246
Total current assets	190,585	130,144	118,347	118,347
Property and equipment, net	3,222	3,565	4,092	4,092
Restricted cash	571	571	571	571
Deferred tax assets, net of current portion	37	2,706	2,706	2,706
Other assets	55	22	137	137
Total assets	$ 194,470	$137,008	$ 125,853	$ 125,853
Liabilities, convertible preferred stock, and stockholders' (deficit) equity				
Current liabilities:				
Accounts payable	$ 3,573	$ 3,308	$ 4,737	$ 4,737
Accrued expenses	1,545	1,708	2,026	2,026
Income taxes payable	17,867	4,875	5,051	5,051
Deferred revenue	25,072	25,072	25,072	25,072
Deferred rent	46	85	94	94
Restricted stock liability	55	65	51	51
Total current liabilities	48,158	35,113	37,031	37,031
Deferred revenue, net of current portion	82,711	57,639	51,371	51,371
Deferred rent, net of current portion	428	343	318	318
Restricted stock liability, net of current portion	33	15	13	13
Commitments and contingencies *(Note 6)*				
Series A convertible preferred stock, $0.001 par value; 33,188,889 shares authorized, issued and outstanding at December 31, 2011 and 2012, and March 31, 2013 (unaudited) and no shares issued and outstanding pro forma (unaudited) *(Note 7); aggregate liquidation preference of $40,973 and $41,471 at December 31, 2012 and March 31, 2013 (unaudited), respectively*	32,940	32,940	32,940	—
Series B convertible preferred stock, $0.001 par value; 5,190,551 shares authorized, issued and outstanding at December 31, 2011 and 2012, and March 31, 2013 (unaudited) and no shares issued and outstanding pro forma (unaudited) (*Note 7); aggregate liquidation preference of $10,232 and $10,362 at December 31, 2012 and March 31, 2013 (unaudited), respectively*	5,681	5,681	5,681	—
Series C convertible preferred stock, $0.001 par value; 15,882,389 shares authorized, issued and outstanding at December 31, 2011 and 2012, and March 31, 2013 (unaudited) and no shares issued and outstanding pro forma (unaudited) *(Note 7); aggregate liquidation preference of $83,252 and $84,422 at December 31, 2012 and March 31, 2013 (unaudited), respectively*	77,301	77,301	77,301	—
Stockholders' (deficit) equity:				
Common stock, $0.001 par value; 75,000,000, 78,300,000, and 78,300,000 shares authorized at December 31, 2011 and 2012, and March 31, 2013 (unaudited), respectively, and 3,197,420, 3,616,101, and 3,681,670 shares issued and outstanding at December 31, 2011 and 2012, and March 31, 2013 (unaudited) respectively, and 23,413,234 shares issued and outstanding pro forma (unaudited)	3	3	3	23
Additional paid-in capital	1,127	2,012	2,461	118,363
Accumulated other comprehensive income (loss)	23	(2)	(1)	(1)
Accumulated deficit	(53,935)	(74,037)	(81,265)	(81,265)
Total stockholders' (deficit) equity	(52,782)	(72,024)	(78,802)	37,120
Total liabilities, convertible preferred stock, and stockholders' (deficit) equity	$ 194,470	$137,008	$ 125,853	$ 125,853

See accompanying notes.

Agios Pharmaceuticals, Inc.

Consolidated Statements of Operations
(in thousands, except share and per share data)

	Years Ended December 31,		Three Months Ended March 31,	
	2011	2012	2012	2013
			(unaudited)	
Collaboration revenue	$ 21,803	$ 25,072	$ 6,268	$ 6,268
Grant revenue	34	34	—	—
Total revenue	21,837	25,106	6,268	6,268
Operating expenses:				
Research and development	31,253	41,037	9,551	11,462
General and administrative	7,215	7,064	1,981	1,852
Total operating expenses	38,468	48,101	11,532	13,314
Loss from operations	(16,631)	(22,995)	(5,264)	(7,046)
Interest income	132	69	26	8
Loss before provision (benefit) for income taxes	(16,499)	(22,926)	(5,238)	(7,038)
Provision (benefit) for income taxes	7,207	(2,824)	(607)	190
Net loss	(23,706)	(20,102)	(4,631)	(7,228)
Cumulative preferred stock dividends	(3,100)	(7,190)	(1,798)	(1,798)
Net loss applicable to common stockholders	$ (26,806)	$ (27,292)	$ (6,429)	$ (9,026)
Net loss per share applicable to common stockholders – basic and diluted	$ (8.90)	$ (8.02)	$ (1.98)	$ (2.47)
Weighted-average number of common shares used in net loss per share applicable to common stockholders – basic and diluted	3,013,366	3,401,719	3,246,844	3,658,016
Pro forma net loss per share applicable to common stockholders – basic and diluted (unaudited)		$ (1.18)		$ (0.39)
Pro forma weighted average number of common shares used in net loss per share applicable to common stockholders – basic and diluted (unaudited)		23,133,283		23,389,580

See accompanying notes.

Agios Pharmaceuticals, Inc.

Consolidated Statements of Comprehensive Loss
(in thousands)

	Years Ended December 31,		Three Months Ended March 31,	
	2011	2012	2012	2013
			(unaudited)	
Net loss	$ (23,706)	$ (20,102)	$ (4,631)	$ (7,228)
Other comprehensive income (loss):				
Unrealized gain (loss) on available-for-sale securities	31	(25)	(2)	(1)
Comprehensive loss	$ (23,675)	$ (20,127)	$ (4,633)	$ (7,229)

See accompanying notes.

Agios Pharmaceuticals, Inc.

Consolidated Statements of Convertible Preferred Stock and Stockholders' (Deficit) Equity
(in thousands, except share amounts)

	Series A Convertible Preferred Stock		Series B Convertible Preferred Stock		Series C Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Accumulated Other Comprehensive (Loss) Income	Accumulated Deficit	Total Stockholders' (Deficit) Equity
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount				
Balance at December 31, 2010	33,188,889	32,940	5,190,551	5,681	—	—	2,837,967	$ 3	643	(8)	(30,229)	(29,591)
Unrealized gain on marketable securities	—	—	—	—	—	—	—	—	—	31	—	31
Net loss	—	—	—	—	—	—	—	—	—	—	(23,706)	(23,706)
Issuance of series C convertible preferred stock, net of issuance costs of $698.7	—	—	—	—	15,882,389	77,301	—	—	—	—	—	—
Stock-based compensation expense	—	—	—	—	—	—	—	—	371	—	—	371
Vesting of restricted stock	—	—	—	—	—	—	181,818	—	56	—	—	56
Issuance of common stock upon exercise of stock options	—	—	—	—	—	—	177,635	—	57	—	—	57
Balance at December 31, 2011	33,188,889	$ 32,940	5,190,551	$ 5,681	15,882,389	$ 77,301	3,197,420	$ 3	$ 1,127	$ 23	$ (53,935)	$ (52,782)
Unrealized loss on marketable securities	—	—	—	—	—	—	—	—	—	(25)	—	(25)
Net loss	—	—	—	—	—	—	—	—	—	—	(20,102)	(20,102)
Stock-based compensation expense	—	—	—	—	—	—	—	—	742	—	—	742
Vesting of restricted stock	—	—	—	—	—	—	183,713	—	56	—	—	56
Issuance of common stock upon exercise of stock options	—	—	—	—	—	—	234,968	—	87	—	—	87
Balance at December 31, 2012	33,188,889	$ 32,940	5,190,551	$ 5,681	15,882,389	$ 77,301	3,616,101	$ 3	$ 2,012	$ (2)	$ (74,037)	$ (72,024)
Unrealized gain on marketable securities (unaudited)	—	—	—	—	—	—	—	—	—	1	—	1
Net loss (unaudited)	—	—	—	—	—	—	—	—	—	—	(7,228)	(7,228)
Stock-based compensation expense (unaudited)	—	—	—	—	—	—	—	—	424	—	—	424
Vesting of restricted stock (unaudited)	—	—	—	—	—	—	50,001	—	16	—	—	16
Issuance of common stock upon exercise of stock options (unaudited)	—	—	—	—	—	—	15,568	—	9	—	—	9
Balance at March 31, 2013 (unaudited)	**33,188,889**	**$ 32,940**	**5,190,551**	**$ 5,681**	**15,882,389**	**$ 77,301**	**3,681,670**	**$ 3**	**$ 2,461**	**$ (1)**	**$ (81,265)**	**$ (78,802)**
Conversion of convertible preferred stock into common stock (unaudited)	(33,188,889)	$(32,940)	(5,190,551)	$ (5,681)	(15,882,389)	$(77,301)	19,731,564	$ 20	$ 115,902	—	—	$ 115,922
Pro forma balance at March 31, 2013 (unaudited)	—	$ —	—	$ —	—	$ —	23,413,234	$ 23	$ 118,363	$ (1)	$ (81,265)	$ 37,120

See accompanying notes.

Agios Pharmaceuticals, Inc.

Consolidated Statements of Cash Flows
(in thousands)

	Years Ended December 31,		Three Months Ended March 31,	
	2011	2012	2012	2013
			(unaudited)	
Operating activities				
Net loss	$ (23,706)	$ (20,102)	$ (4,631)	$ (7,228)
Adjustments to reconcile net loss to net cash used in operating activities:				
Depreciation	801	1,179	264	349
Net loss on disposal of fixed assets	—	10	—	—
Stock-based compensation expense	371	742	98	424
Deferred rent	243	(46)	(5)	(15)
Deferred taxes	(10,660)	6,707	1,505	—
Amortization (accretion) of premium (discount) on investments	391	287	88	(5)
Changes in operating assets and liabilities:				
Prepaid expenses and other assets	(63)	(94)	(172)	(544)
Accounts payable	809	(322)	(1,457)	829
Accrued expenses and other liabilities	525	156	189	301
Income taxes payable	17,867	(12,993)	(5,585)	176
Deferred revenue	(1,797)	(25,072)	(6,268)	(6,268)
Net cash used in operating activities	(15,219)	(49,548)	(15,974)	(11,981)
Investing activities				
Purchases of marketable securities	(105,936)	(88,524)	(26,394)	(15,915)
Proceeds from maturities and sales of marketable securities	85,482	113,041	36,804	20,226
Purchases of property and equipment	(1,906)	(1,475)	(21)	(275)
Net cash (used in) provided by investing activities	(22,360)	23,042	10,389	4,036
Financing activities				
Net proceeds from issuance of Series C convertible preferred stock	77,301	—	—	—
Net proceeds from stock option exercises and issuance of common and restricted common stock	57	142	38	25
Net cash provided by financing activities	77,358	142	38	25
Net increase (decrease) in cash and cash equivalents	39,779	(26,364)	(5,547)	(7,920)
Cash and cash equivalents at beginning of the period	77,882	117,661	117,661	91,297
Cash and cash equivalents at end of the period	$ 117,661	$ 91,297	$ 112,114	$ 83,377
Supplemental cash flow information				
Cash paid for income taxes	$ —	$ 3,549	$ 3,500	$ —

See accompanying notes.

Agios Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements

Information as of March 31, 2013 and for the three months ended March 31, 2012 and 2013 is unaudited.

1. Nature of Business

Agios Pharmaceuticals, Inc. ("Agios" or "the Company") is a biopharmaceutical company committed to the fundamental transformation of patients' lives through scientific leadership in the field of cancer metabolism and inborn errors of metabolism. The Company has built a set of core capabilities in the field of cellular metabolism, with the goal of making transformative, first or best in class medicines. The Company's therapeutic areas of focus are cancer and inborn errors of metabolism, which are a broad group of more than 600 rare genetic diseases caused by mutations, or defects, of single metabolic genes. In both of these areas, the Company is seeking to unlock the biology of cellular metabolism to create transformative therapies. The Company was incorporated in Delaware on August 7, 2007, and is located in Cambridge, Massachusetts.

Liquidity

The Company has an accumulated deficit as of December 31, 2012 of approximately $74.0 million and will require substantial additional capital for research and product development. The future success of the Company is dependent on its ability to develop its product candidates and ultimately upon its ability to attain profitable operations. The Company is subject to a number of risks similar to other life science companies, including, but not limited to, successful discovery and development of its drug candidates, raising additional capital, development by its competitors of new technological innovations, protection of proprietary technology and market acceptance of the Company's products. At December 31, 2012, the Company believes its cash, cash equivalents and marketable securities, totaling approximately $128.0 million, are sufficient to fund operations for a period of at least 12 months from the balance sheet date.

2. Summary of Significant Accounting Policies

Principles of Consolidation

The Company's consolidated financial statements include the Company's accounts and the accounts of the Company's wholly owned subsidiary, Agios Securities Corporation. All intercompany transactions have been eliminated in consolidation. The consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States ("GAAP").

Unaudited Interim Financial Statements

The unaudited interim financial statements as of March 31, 2013 and for the three months ended March 31, 2012 and 2013 and the related interim information contained within the notes to the consolidated financial statements are unaudited. The unaudited interim financial statements have been prepared on the same basis as the annual financial statements and, in the opinion of management, reflect all adjustments, which include only normal recurring adjustments, necessary to present fairly the Company's consolidated financial position as of March 31, 2013 and its results of operations and cash flows for the three months ended March 31, 2012 and 2013. The consolidated results of operations and cash flows for the three months ended March 31, 2013 are not necessarily indicative of the results to be expected for the year ending December 31, 2013 or for any other future annual or interim period.

Unaudited Pro Forma Financial Information

On May 20, 2013, the Company's board of directors authorized the management of the Company to submit on a confidential basis a registration statement with the Securities and Exchange Commission ("SEC") for the Company to sell shares of its common stock (the "Common Stock") to the public. Upon the closing of a qualified initial public offering, all of the Company's outstanding convertible preferred stock will automatically convert into Common Stock. The unaudited pro forma consolidated balance sheet and statement of convertible preferred stock and stockholders' equity as of March 31, 2013 assumes the conversion of all outstanding convertible preferred stock into shares of Common Stock upon the completion of this proposed offering.

Unaudited pro forma net loss per share applicable to common stockholders is computed using the weighted-average number of common shares outstanding after giving effect to the conversion of all convertible preferred stock into shares of the Common Stock as if such conversion had occurred at the beginning of the period presented, or the date of original issuance, if later. Accordingly, the pro forma basic and diluted net loss per share attributable to common stockholders does not include the effects of the cumulative preferred stock dividends.

Use of Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires the Company's management to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. Actual results could differ from those estimates.

The Company utilizes significant estimates and assumptions in determining the fair value of its Common Stock. The board of directors 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 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 initial public offering or sale of the Company.

The Company utilized various valuation methodologies in accordance with the framework of the American Institute of Certified Public Accountants, or AICPA, *Audit and Accounting Practice Aid Series: Valuation of Privately Held Company Equity Securities Issued as Compensation* , or the AICPA Practice Aid, to estimate the fair value of its common stock and in performing retrospective valuation analyses for certain grant dates in 2012. The methodologies included the Option Pricing Method utilizing the Backsolve Method (a form of the market approach defined in the AICPA Practice Aid) and the Probability-Weighted Expected Return Method based upon the probability of occurrence of certain future liquidity events such as an initial public offering or sale of the Company. Each valuation methodology includes estimates and assumptions that require the Company's judgment. Significant changes to the key assumptions used in the valuations could result in different fair values of Common Stock at each valuation date.

Revenue Recognition

The Company recognizes revenue in accordance with Accounting Standards Codification ("ASC") 605, *Revenue Recognition*. Accordingly, revenue is recognized for each unit of accounting when all of the following criteria are met:

- Persuasive evidence of an arrangement exists,
- Delivery has occurred or services have been rendered,
- The seller's price to the buyer is fixed or determinable, and
- Collectability is reasonably assured.

Agios Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements (continued)

The Company's revenues have been generated from a Discovery and Development Collaboration and License Agreement with Celgene Corporation ("the Celgene Agreement") and from research grant agreements. Revenue related to research grant agreements is recognized as the underlying services are performed.

For multiple-element arrangements entered into prior to January 1, 2011 and not materially modified thereafter, the Company continues to apply its prior accounting policy with respect to such arrangements. Under this policy, when evaluating multiple element arrangements, the Company considers whether the components of the arrangement should be accounted for individually as separate units of accounting if (1) the elements have stand-alone value, and (2) the Company is able to estimate the fair value of all undelivered elements under the arrangement.

In January 2011, the Company adopted the Financial Accounting Standards Board's ("FASB") Accounting Standards Update ("ASU") No. 2009-13, *Multiple-Element Revenue Arrangements*, on a prospective basis for all revenue arrangements entered into or materially modified after the adoption date. The Celgene Agreement was entered into prior to the effective date of this ASU and has not been materially modified, and is therefore not subject to this ASU.

Pursuant to ASU 2009-13, revenue arrangements where multiple products or services are sold together are evaluated to determine if each deliverable represents a separate unit of accounting based on the following criteria:

- Delivered item or items have value to the customer on a standalone basis, and
- If the arrangement includes a general right of return relative to the delivered item or items, delivery or performance of the undelivered item or items is considered probable and substantially in the control of the vendor.

The arrangement consideration is then allocated to each separately identified unit of accounting based on the relative selling price of each deliverable. The provisions of ASC 605-25, *Multiple-Element Arrangements* are then applied to each unit of accounting to determine the appropriate revenue recognition. In the event that a deliverable of a multiple element arrangement does not represent a separate unit of accounting, the Company recognizes revenue from the combined unit of accounting over the term of the related contract or as undelivered items are delivered, as appropriate.

In January 2011, the Company adopted the FASB's ASU No. 2010-17, *Revenue Recognition – Milestone Method*, on a prospective basis. ASU 2010-17 provides guidance in applying the milestone method of revenue recognition to research or development arrangements. Under this guidance, management may recognize revenue contingent upon the achievement of a milestone in its entirety in the period in which the milestone is achieved, only if the milestone meets all the criteria within the guidance to be considered substantive. In accordance with ASU 2010-17, at the inception of each arrangement that includes milestone payments, the Company evaluates each contingent payment on an individual basis to determine whether they are considered substantive milestones, specifically reviewing factors such as the degree of certainty in achieving the milestone, the research and development risk and other risks that must be overcome to achieve the milestone, as well as the level of effort and investment required and whether the milestone consideration is reasonable relative to all deliverables and payment terms in the arrangement. 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 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.

Revenues from milestones, if they are nonrefundable and deemed substantive, are recognized upon achievement of the milestones. To the extent that non-substantive milestones are achieved and the Company has remaining performance obligations, milestones are deferred and recognized as revenue over the estimated remaining performance period. The Company recognizes revenue associated with the non-substantive milestones upon achievement of the milestone if there are no undelivered elements and the Company has no remaining performance obligations.

Research and Development Costs

Research and development costs are expensed as incurred. Research and development costs include salaries and personnel-related costs, consulting fees, fees paid for contract research services, the costs of laboratory equipment and facilities, and other external costs.

Nonrefundable advance payments for goods or services to be received in the future for use in research and development activities are deferred and capitalized. The capitalized amounts are expensed as the related goods are delivered or the services are performed.

Stock-Based Compensation

The Company accounts for its stock-based compensation awards in accordance with ASC Topic 718, *Compensation – Stock Compensation* ("ASC 718"). ASC 718 requires all stock-based payments to employees, including grants of employee stock options, to be recognized in the consolidated statements of operations based on their grant date fair values. For stock options granted to employees and to members of the board of directors for their services on the board of directors, the Company estimates the grant date fair value of each option award 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. For awards subject to both performance and service-based vesting conditions, the Company recognizes stock-based compensation expense using an accelerated recognition method.

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, *Equity*. For equity instruments granted to non-employees, the Company recognizes stock-based compensation expense using an accelerated recognition method.

During the years ended December 31, 2011 and 2012, and the three months ended March 31, 2012 and 2013, the Company recorded stock-based compensation expense for employee and non-employee stock options and restricted stock, which was allocated as follows in the consolidated statements of operations (in thousands):

	Years Ended December 31,		Three Months Ended March 31,	
	2011	2012	2012	2013
Research and development expense	$253	$605	$66	$ 287
General and administrative expense	118	137	32	137
	$371	$ 742	$ 98	$ 424

No related tax benefits were recognized for the years ended December 31, 2011 and 2012 or for the three months ended March 31, 2012 and 2013.

Income Taxes

Income taxes are recorded in accordance with ASC 740, *Accounting for 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. The Company determines its deferred tax assets and liabilities based on differences between financial reporting and tax bases of assets and liabilities, which are measured using the enacted tax rates and laws that will be in effect when 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, 2011 and 2012 and March 31, 2013, the Company does not have any significant uncertain tax positions.

Comprehensive Income (Loss)

Comprehensive income (loss) is defined as the change in equity of a business enterprise during a period from transactions, and other events and circumstances from non-owner sources, and currently consists of net loss and changes in unrealized gains and losses on available-for-sale securities.

Cash and Cash Equivalents

The Company considers highly liquid investments with a maturity of three months or less when purchased to be cash equivalents. Cash equivalents, which consist primarily of money market funds, are stated at fair value.

Marketable Securities

Marketable securities at December 31, 2012 and March 31, 2013 consisted primarily of investments in U.S. Treasuries. Marketable securities at December 31, 2011 consisted primarily of investments in U.S. Treasuries and corporate debt. Management determines the appropriate classification of the securities at the time they are acquired and evaluates the appropriateness of such classifications at each balance sheet date. The Company classifies its marketable securities as available-for-sale pursuant to ASC 320, *Investments – Debt and Equity Securities*. Marketable securities are recorded at fair value, with unrealized gains and losses included as a component of accumulated other comprehensive income (loss) in stockholders' (deficit) equity and a component of total comprehensive loss in the consolidated statements of comprehensive loss, until realized. The fair value of these securities is based on quoted prices for identical or similar assets. Realized gains and losses are included in investment income on a specific-identification basis. There were no realized gains or losses on marketable securities for the year ended December 31, 2012 and the three months ended March 31, 2013 and 2012. The Company sold five securities during 2011 for gross proceeds of $13.0 million and recognized a gain of $1,000 for the year ended December 31, 2011.

The Company reviews marketable securities for other-than-temporary impairment whenever the fair value of a marketable security is less than the amortized cost and evidence indicates that a marketable security's carrying amount is not recoverable within a reasonable period of time. Other-than-temporary impairments of investments are recognized in the consolidated statements of operations if the Company has experienced a credit loss, has the

intent to sell the marketable security, or if it is more likely than not that the Company will be required to sell the marketable security before recovery of the amortized cost basis. Evidence considered in this assessment includes reasons for the impairment, compliance with the Company's investment policy, the severity and the duration of the impairment and changes in value subsequent to the end of the period.

Marketable securities at December 31, 2011 consist of the following (in thousands):

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Corporate debt securities	$ 20,819	$ 12	$ (1)	$ 20,830
Certificates of deposit	7,714	—	(5)	7,709
U.S. Treasuries	32,951	17	—	32,968
	$ 61,484	$ 29	$ (6)	$61,507

Marketable securities at December 31, 2012 consist of the following (in thousands):

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Certificates of deposit	$ 7,386	$ —	$ (2)	$ 7,384
U.S. Treasuries	29,294	1	—	29,295
	$ 36,680	$ 1	$ (2)	$ 36,679

Marketable securities at March 31, 2013 consist of the following (in thousands):

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Certificates of deposit	$ 3,080	$ —	$ (1)	$ 3,079
U.S. Treasuries	29,295	1	(1)	29,295
	$ 32,375	$ 1	$ (2)	$ 32,374

All of the investments held at December 31, 2011 and 2012 and March 31, 2013 had maturities of less than one year.

At December 31, 2011, December 31, 2012 and March 31, 2013, the Company held 35, 30, and 14 debt securities that were in an unrealized loss position for less than one year, respectively. The aggregate fair value of debt securities in an unrealized loss position at December 31, 2011, December 31, 2012 and March 31, 2013 was $18.8 million, $13.7 million and $17.6 million, respectively. There were no individual securities that were in a significant unrealized loss position as of December 31, 2011 and 2012 and March 31, 2013. The Company evaluated its securities for other-than-temporary impairment and considered the decline in market value for the securities to be primarily attributable to current economic and market conditions. It is not more likely than not that the Company will be required to sell the securities, and the Company does not intend to do so prior to the recovery of the amortized cost basis. Based on this analysis, these marketable securities were not considered to be other-than-temporarily impaired as of December 31, 2011 and 2012 and March 31, 2013.

Agios Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements (continued)

Concentrations of Credit Risk

Financial instruments which potentially subject the Company to credit risk consist primarily of cash, cash equivalents and marketable securities. The Company holds these investments in highly rated financial institutions, and, by policy, limits the amounts of credit exposure to any one financial institution. These amounts at times may exceed federally insured limits. The Company has not experienced any credit losses in such accounts and does not believe it is exposed to any significant credit risk on these funds. The Company has no significant off-balance sheet concentrations of credit risk, such as foreign currency exchange contracts, option contracts or other hedging arrangements.

Fair Value Measurements

The Company records cash equivalents and marketable securities at fair value. ASC Topic 820, *Fair Value Measurements and Disclosures*, establishes a fair value hierarchy for those instruments measured at fair value that distinguishes between assumptions based on market data (observable inputs) and the Company's own assumptions (unobservable inputs). The hierarchy consists of three levels:

Level 1 – Unadjusted quoted prices in active markets for identical assets or liabilities.

Level 2 – Quoted prices for similar assets and liabilities in active markets, quoted prices in markets that are not active, or inputs which are observable, either directly or indirectly, for substantially the full term of the asset or liability.

Level 3 – Unobservable inputs that reflect the Company's own assumptions about the assumptions market participants would use in pricing the asset or liability in which there is little, if any, market activity for the asset or liability at the measurement date.

The following table summarizes the cash equivalents and marketable securities measured at fair value on a recurring basis as of December 31, 2011 (in thousands):

	Level 1	Level 2	Level 3	Total
Cash equivalents	$116,150	$ 480	$—	$116,630
Marketable securities:				
Corporate debt securities	—	20,830	—	20,830
Certificates of deposit	—	7,709	—	7,709
U.S. Treasuries	32,968	—	—	32,968
	$149,118	$29,019	$—	$178,137

The following table summarizes the cash equivalents and marketable securities measured at fair value on a recurring basis as of December 31, 2012 (in thousands):

	Level 1	Level 2	Level 3	Total
Cash equivalents	$ 89,062	$ —	$—	$ 89,062
Marketable securities:				
Certificates of deposit	—	7,384	—	7,384
U.S. Treasuries	29,295	—	—	29,295
	$118,357	$7,384	$—	$125,741

Agios Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements (continued)

The following table summarizes the cash equivalents and marketable securities measured at fair value on a recurring basis as of March 31, 2013 (in thousands):

	Level 1	Level 2	Level 3	Total
Cash equivalents	$ 82,417	$ 960	$ —	$ 83,377
Marketable securities:				
Certificates of deposit	—	3,079	—	3,079
U.S. Treasuries	29,295	—	—	29,295
	$111,712	$4,039	$ —	$115,751

Cash equivalents and marketable securities have been initially valued at the transaction price and subsequently valued, at the end of each reporting period, utilizing third party pricing services or other market observable data. The pricing services utilize industry standard valuation models, including both income and market based approaches and observable market inputs to determine value. The Company validates the prices provided by our third party pricing services by reviewing their pricing methods and obtaining market values from other pricing sources. After completing its validation procedures, the Company did not adjust or override any fair value measurements provided by the pricing services as of December 31, 2011, December 31, 2012 or March 31, 2013.

The carrying amounts reflected in the consolidated balance sheets for cash, prepaid expenses and other current assets, other assets, accounts payable, and accrued expenses approximate their fair values at December 31, 2011 and 2012 and March 31, 2013, due to their short-term nature.

There have been no changes to the valuation methods during the years ended December 31, 2011 and 2012 or the three months ended March 31, 2012 and 2013. The Company evaluates transfers between levels at the end of each reporting period. There were no transfers of assets or liabilities between Level 1 and Level 2 during the years ended December 31, 2011 and 2012 or the three months ended March 31, 2012 and 2013. The Company had no financial assets or liabilities that were classified as Level 3 at any point during the years ended December 31, 2011 or 2012 or the three months ended March 31, 2012 and 2013.

Property and Equipment

Property and equipment consist of laboratory equipment, computer equipment and software, leasehold improvements, furniture and fixtures, and office equipment. Property and equipment is stated at cost, and depreciated using the straight-line method over the estimated useful lives of the respective assets:

Laboratory equipment	5 years
Computer equipment and software	3 years
Leasehold improvements	Shorter of asset’s useful life or remaining term of lease
Furniture and fixtures	5 years
Office equipment	5 years

Costs of major additions and betterments are capitalized; maintenance and repairs, which do not improve or extend the life of the respective assets, are charged to expense as incurred. Upon retirement or sale, the cost of the disposed asset and the related accumulated depreciation are removed from the accounts and the resulting gain or loss is recognized.

Agios Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements (continued)

Impairment of Long-Lived Assets

The Company periodically evaluates its long-lived assets for potential impairment in accordance with ASC Topic 360, *Property, Plant and Equipment*. Potential impairment is assessed when there is evidence that events or changes in circumstances indicate that the carrying amount of an asset may not be recovered. Recoverability of these assets is assessed based on undiscounted expected future cash flows from the assets, considering a number of factors, including past operating results, budgets and economic projections, market trends and product development cycles. If impairments are identified, assets are written down to their estimated fair value. The Company has not recognized any impairment charges through March 31, 2013.

Segment and Geographic 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 decision maker view the Company's operations and manage its business as one operating segment. The Company operates in only one geographic segment.

Subsequent Events

The Company considered events or transactions occurring after the balance sheet date but prior to the date the consolidated financial statements are available to be issued for potential recognition or disclosure in its consolidated financial statements. Subsequent events have been evaluated through May 23, 2013, the date the consolidated financial statements were available to be issued.

Net Loss per Share Applicable to Common Stockholders

Basic net loss per share applicable to common stockholders is calculated by dividing net loss applicable to common stockholders by the weighted average shares outstanding during the period, without consideration for common stock equivalents. Net loss applicable to common stockholders is calculated by adjusting the net loss of the Company for cumulative preferred stock dividends. Diluted net loss per share applicable to common stockholders is calculated by adjusting weighted average shares outstanding for the dilutive effect of common stock equivalents outstanding for the period, determined using the treasury-stock method. For purposes of the dilutive net loss per share applicable to common stockholders calculation, preferred stock, stock options, and unvested restricted stock are considered to be common stock equivalents but are excluded from the calculation of diluted net loss per share applicable to common stockholders, as their effect would be anti-dilutive; therefore, basic and diluted net loss per share applicable to common stockholders were the same for all periods presented. The following common stock equivalents were excluded from the calculation of diluted net loss per share applicable to common stockholders for the periods indicated because including them would have had an anti-dilutive effect. The convertible preferred stock numbers shown in the table are on a common stock equivalent basis as a result of the reverse stock split described in Note 12, Subsequent Events.

	Years ended December 31,		Three Months Ended March 31,	
	2011	2012	2012	2013
Convertible preferred stock	19,731,564	19,731,564	19,731,564	19,731,564
Stock options	2,693,873	3,145,544	2,718,710	3,089,917
Unvested restricted stock	291,666	160,053	246,212	110,053
	22,717,103	23,037,161	22,696,486	22,931,534

Agios Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements (continued)

3. Collaboration Agreement

In April 2010, the Company entered into a collaboration agreement with Celgene Corporation, or Celgene, focused on cancer metabolism. This agreement was amended in October 2011, as described below. The goal of the collaboration is to discover, develop and commercialize disease-altering therapies in oncology based on the Company's cancer metabolism research platform. The Company is leading discovery, preclinical and early clinical development for all cancer metabolism programs under the collaboration. The discovery phase of the amended collaboration expires in April 2014, subject to Celgene's option to extend the discovery phase for up to an additional two years with additional funding to the Company. Celgene has the option to obtain exclusive rights for the further development and commercialization of certain of the programs, and the Company will retain rights to the others. The Company may elect to participate in a portion of sales activities for the medicines from such programs in the United States. In addition, for certain of the programs that Celgene chooses to license, the Company may elect to retain full rights to develop and commercialize medicines from these programs in the United States.

Pursuant to the collaboration, the Company is responsible for nominating development candidates, of which two must be confirmed by the Joint Research Committee ("JRC") during the discovery phase. During the three months ended December 31, 2012, the Company nominated its first development candidate, and during the three months ended March 31, 2013, the Company nominated its second development candidate, both of which have been confirmed by the JRC, pursuant to the agreement. The JRC will be dissolved and its activities and authority terminated upon the end of the discovery phase. For each development candidate, Celgene may elect to progress into preclinical development. If Celgene makes such an election, the Company will be required to conduct studies to meet the requirements for filing an Investigational New Drug application, or IND, or IND-enabling studies, and, following the successful completion as confirmed by the JRC, the Company will file an IND to commence clinical studies of such development candidate. If the FDA accepts the IND, Celgene may request that the Company conduct an initial phase 1 study, for which the Company would be entitled to receive a milestone payment of $5.0 million upon enrollment of the last patient in the phase 1 study, unless such program becomes a split licensed program, as described below.

Celgene may elect to convert each discovery program for which the Company has nominated a development candidate into a co-commercialized licensed program, the attributes of which are described below. The Company has the right, exercisable during a specified period following FDA acceptance of the applicable IND, to convert one of every three co-commercialized licensed programs into a split licensed program, for which the Company will retain the United States rights, other attributes of which are further described below. The Company's IDH2 program will not be a split licensed program.

The Company will retain the rights to the development candidate and certain other compounds for which Celgene does not elect to progress into preclinical development or convert into a co-commercialized licensed program. In addition, if the JRC or Celgene elects not to continue collaboration activities with respect to a particular target, either the Company or Celgene would have the right to independently undertake a discovery program on such target and would have rights to specified compounds from such program, subject to certain "buy-in" rights granted to the other party.

The agreement provides for three types of licensed programs as discussed above:

Co-Commercialized Licensed Programs: Celgene will lead and, following either IND acceptance by the FDA or, if Celgene requests us to conduct a phase 1 study, upon completion of such phase 1 study, will fund global development and commercialization. The Company has the right to participate in a portion of sales activities in the United States for products from co-commercialized programs in accordance with the applicable commercialization plan. The Company will be eligible to receive milestone payments and royalties arising from the licensed program.

Split Licensed Programs: Celgene will lead development and commercialization outside the United States and the Company will lead development and commercialization in the United States. The Company and Celgene will equally fund the global development costs of each split licensed program that are not specific to any particular region or country, Celgene will be responsible for development and commercialization costs specific to countries outside the United States, and the Company will be responsible for development and commercialization costs specific to the United States. The Company will retain profits generated in the United States and will also be eligible to receive milestone payments and royalties arising from net sales outside the United States. The Company will be obligated to pay Celgene royalties arising from net sales in the United States.

Buy-In Programs: If a party elects to independently undertake a discovery program, with respect to a particular target under the agreement, the party that is conducting the independent program that becomes a buy-in program will lead the development and commercialization of such program. The party that elects to buy in to such program will be responsible for funding a portion of development costs incurred after acceptance of an IND for a buy-in program compound, and the lead party will be responsible for all other development costs and all commercialization costs for products from such buy-in program. The commercializing party will be obligated to pay the buy-in party specified royalties on worldwide net sales.

In addition, Celgene may license certain discovery programs for which the Company did not nominate or the JRC did not confirm as a development candidate and for which Celgene will lead and fund global development and commercialization.

The term of the agreement will continue, unless earlier terminated by either party, until the expiration of the last-to-expire of all royalty terms with respect to all royalty-bearing products or the expiration of the option term if Celgene fails to extend the term of the agreement, does not select any compounds pursuant to the agreement, and there are no existing programs covered by the agreement.

Celgene may terminate the agreement for convenience in its entirety or with respect to one or more programs upon ninety days written notice to the Company. Either the Company or Celgene may terminate the agreement in its entirety or with respect to one or more programs, if the other party is in material breach and fails to cure such breach within the specified cure period; however, if such breach relates solely to a specific program, the non-breaching party may only terminate the agreement with respect to such program. Either the Company or Celgene may terminate the agreement in the event of specified insolvency events involving the other party.

Under the terms of the agreement, the Company received an upfront payment of approximately $121.2 million. In addition, Celgene purchased 5,190,551 shares of Series B convertible preferred stock (Series B Preferred Stock) at a price of $1.70 per share, resulting in net proceeds of approximately $8.8 million. The Company determined the price paid by Celgene for the Series B Preferred Stock represented a premium over the fair value of the Company's Series B Preferred Stock as determined by the implied value of the Series B Preferred Stock pursuant to a contemporaneous valuation analysis that allocated the equity value of the Company to the various classes of securities. The Company accounted for the $3.1 million premium as additional consideration under the agreement and the Series B Preferred Stock was recorded at its fair value of $5.7 million.

The Company identified several deliverables under the agreement, including the option to obtain a license or licenses and research and development services to be performed by the Company on behalf of Celgene, including manufacturing of clinical and preclinical supply through completion of phase 1 clinical trials. The Company concluded that the option to obtain a license does not have stand-alone value to Celgene apart from the related research and development services deliverables as there are no other vendors selling similar, competing products on a stand-alone basis, Celgene does not have the contractual right to resell the option to obtain a license, and Celgene is unable to use the license for its intended purpose without the Company's performance of research and

development services. In addition, the Company was not able to estimate the fair value of the undelivered items in the agreement. Accordingly, the Company has accounted for the deliverables as one unit of accounting. As such, a total of $124.3 million of revenue is being recognized on a straight-line basis over the period over which the Company expects to fulfill its performance obligations (the performance period), which was determined to be 6 years. The Company evaluates the performance period at each reporting period.

In October 2011, the agreement was amended to extend the term of the initial discovery period from three to four years, to April 2014. The amendment was not deemed to be a material modification to the arrangement since there were no changes in the deliverables or the total arrangement consideration, as the provisions of the original agreement provided Celgene with the option to extend the research period for the same consideration. Celgene made a payment to Agios of $20.0 million pursuant to the amendment. The payment was combined with the unamortized upfront payment and premium and is being recognized as revenue on a straight-line basis over the performance period. The Company may also be eligible to receive up to $40.0 million in extension payments to extend the discovery phase until April 2016.

The Company recorded revenue of approximately $21.8 million, $25.1 million, $6.3 million, and $6.3 million for the years ended December 31, 2011 and 2012 and the three months ended March 31, 2012 and 2013, respectively.

The Company is eligible to receive up to $120.0 million in potential milestone payments payable for each program selected by Celgene. The potential milestone payments for each such program are comprised of: (i) a $25.0 million milestone payment upon achievement of a specified clinical development milestone event, (ii) up to $70.0 million in milestone payments upon achievement of specified regulatory milestone events, and (iii) a $25.0 million milestone payment upon achievement of a specified commercial milestone event.

The Company is also eligible to receive additional milestone payments specific to co-commercialized licensed programs and split licensed programs. Each co-commercialized licensed program is eligible to receive a minimum one-time payment of $5.0 million upon the enrollment of the last patient in a phase 1 multiple ascending dose study. In addition, we are eligible to receive a substantive milestone payment of $22.5 million upon achievement of an early clinical development milestone event for certain co-commercialized licensed programs. The first split licensed program under the collaboration is eligible to receive a one-time payment of $25.0 million upon the dosing of the last patient in a Company-sponsored phase 2 clinical trial. The Company may also receive royalties at tiered, low to mid-teen percentage rates on sales and has the option to participate in the development and commercialization of certain products in the United States. As of March 31, 2013 the Company has not received any milestone or royalty payments under the agreement. The next potential milestone that the Company might be entitled to receive under this agreement is $5.0 million upon enrollment of the last patient in a phase 1 multiple ascending dose study, unless such program becomes a split licensed program.

The Company has concluded that certain of the clinical development and regulatory milestones that may be received under the Celgene Agreement, if the Company is involved in future product development and commercialization, are substantive. Factors considered in the evaluation of the milestones included the degree of risk associated with performance of the milestone, the level of effort and investment required, whether the milestone consideration was reasonable relative to the deliverables and whether the milestone was earned at least in part based on the Company's performance. Revenues from substantive milestones, if they are nonrefundable, are recognized as revenue upon successful accomplishment of the milestones. Clinical and regulatory milestones are deemed non-substantive if they are based solely on the collaborator's performance. Non-substantive milestones will be recognized when achieved to the extent the Company has no remaining performance obligations under the arrangement. Milestone payments earned upon achievement of commercial milestone events will be recognized when earned.

Agios Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements (continued)

4. Property and Equipment

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

	December 31,		March 31,
	2011	2012	2013
Laboratory equipment	$ 3,534	$ 4,903	$5,618
Computer equipment and software	820	902	982
Leasehold improvements	97	97	97
Furniture and fixtures	313	331	334
Office equipment	51	83	161
Total property and equipment	4,815	6,316	7,192
Less accumulated depreciation	(1,593)	(2,751)	(3,100)
Total property and equipment, net	$ 3,222	$ 3,565	$ 4,092

Depreciation expense for the years ended December 31, 2011 and 2012 and for the three months ended March 31, 2012 and 2013 was $0.8 million, $1.2 million, $0.3 million, and $0.3 million, respectively.

5. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consist of the following (in thousands):

	December 31,		March 31,
	2011	2012	2013
Accrued compensation	$ 979	$1,124	$ 850
Accrued contracted research costs	226	410	708
Accrued professional fees	163	109	455
Accrued other	177	65	13
Total	$1,545	$1,708	$2,026

6. Commitments and Contingencies

Operating Lease

On August 1, 2010, the Company entered into an operating lease for 38,536 square feet of office and laboratory space located at 38 Sidney Street, Cambridge, Massachusetts, which expires on April 14, 2016 (the “Lease”). At the end of the lease term, the Company has the option to extend the Lease for two additional consecutive terms of five years. The Lease agreement includes rent escalation clauses and a free rent period. The Company records rent expense on a straight-line basis over the effective term of the Lease, including any free rent periods. The Company was obligated to, and has provided, a standby letter of credit of $571,000 as security for the Lease. Accordingly, the Company classified $571,000 as restricted cash in the consolidated balance sheets as of December 31, 2011 and 2012, and March 31, 2013.

Rent expense for each of the years ended December 31, 2011 and 2012 was $2.2 million and rent expense for each of the three months ended March 31, 2012 and 2013 was $0.6 million. The operating lease requires the Company to share in prorated operating expenses and property taxes based upon actual amounts incurred; those amounts are not fixed for future periods and, therefore, are not included in the future commitments listed below.

Future annual minimum lease payments due under the operating lease at December 31, 2012 are as follows (in thousands):

Year ending December 31:	
2013	$2,270
2014	2,309
2015	2,347
2016	787
Total minimum lease payments	$7,713

The Trustees of the University of Pennsylvania

In August 2012, the Company entered into a license agreement with The Trustees of the University of Pennsylvania (Penn), pursuant to which Penn granted the Company a worldwide exclusive license to certain intellectual property rights for the development of diagnostic products to detect the metabolism of certain cancers. The Company is obligated to pay Penn up to $100,000 in milestone payments, contingent upon the issuance of certain patents. For each product developed under the agreement the Company has the right to elect to develop and commercialize the product or to grant Penn an exclusive license to develop and commercialize the product. Under the agreement, the applicable party will pay to the other party a royalty based on worldwide net sales of products. To date, there have been no milestones achieved or any sales of products licensed.

The term of the agreement will continue, unless earlier terminated by either party, until the expiration of the last-to-expire issued patent. Either party may terminate the agreement in the event of the failure of the other party to make required payments under the agreement or an uncured material breach by the other party. In addition, Penn may terminate the agreement if the Company becomes insolvent or challenges certain licensed patent rights.

Other License Agreements

The Company has entered into various cancelable license agreements for certain technology. None of the Company's lead product candidates utilize technology covered by these licenses. In consideration for the licensed rights the Company made up-front payments totaling $340,000 and issued a total of 162,545 shares of common stock to certain licensors. The Company is obligated to pay annual maintenance payments totaling $30,000 to certain of the licensors, which are recognized as research and development expense. The Company could be required to make patent-related, clinical development, regulatory and sales-based milestones of up to $0.2 million, $1.6 million, $5.3 million and $3.5 million, respectively, to the licensors. The license agreements also require the Company to remit royalties in amounts ranging from 0.5% to 2.5% based on net sales of products utilizing the licensed technology. The Company is also required to make payments in amounts ranging from 7.0% to 12.5% for non-royalty income received from any sublicense of the rights granted to the Company under the agreements. Total license expense incurred under the license agreements amounted to $30,000 during each of the years ended December 31, 2012 and 2011. The Company has not paid any milestones or royalties to date.

Legal Contingencies

The Company does not currently have any contingencies related to ongoing legal matters.

7. Convertible Preferred Stock

In 2008 and 2009, the Company sold a total of 33,188,889 shares of Series A convertible preferred stock to investors at $1.00 per share, resulting in aggregate proceeds of $33.1 million, including the conversion of the principal and interest on $2.0 million of convertible notes.

In April 2010, the Company executed a strategic collaboration agreement with Celgene Corporation (Note 3). In connection with the Celgene Agreement, the Company sold 5,190,551 shares of Series B convertible preferred stock (Series B Preferred Stock) to Celgene at $1.70 per share, resulting in aggregate proceeds of $8.8 million. The Company determined the fair value per share of the Series B Preferred Stock on the date of issuance to be $1.11 and has considered the premium paid over the fair value of the Series B Preferred Stock to be additional consideration under the Celgene Agreement. Refer to Note 3 for further discussion of the treatment of the implied premium on the Series B Preferred Stock.

In November 2011, the Company completed a Series C convertible preferred stock financing, pursuant to which the Company sold 15,882,389 shares of Series C convertible preferred stock to investors at $4.91 per share, resulting in aggregate proceeds of $78.0 million. The shares of Series C convertible preferred stock included 7,395,829 shares of Series C-1 convertible preferred stock (the C-1 Preferred Stock) and 8,486,560 shares of Series C-2 convertible preferred stock (the C-2 Preferred Stock) (collectively, the Series C Preferred Stock).

The Company assessed the Series A, B and C Preferred Stock (collectively, the "Preferred Stock") for any embedded derivatives that would require bifurcation from the Preferred Stock and receive separate accounting treatment. No embedded derivatives were identified that would require bifurcation.

The holders of the Preferred Stock have the following rights:

Conversion

Each share of Preferred Stock is initially convertible into one share of common stock. The conversion ratio is subject to adjustment for certain dilutive events, such as, but not limited to, stock splits and dividends. Conversion is at the option of the holder; however, it is automatic upon:

(a) the closing of the sale of shares of common stock to the public in a firm-commitment underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended, resulting in at least $30,000,000 of gross proceeds to the Company and with either (1) a price of at least $5.00 per share (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Common Stock) or (2) a listing of the common stock on a nationally recognized securities exchange or trading system; or

(b) at a date agreed to in writing by (1) the holders of at least 60% of the outstanding shares of Series A Preferred Stock, (2) the holders of a majority of the outstanding shares of Series B Preferred Stock and (3) the majority of the holders of the Series C-1 Preferred Stock.

The Company evaluated each series of its preferred stock and determined that each individual series is considered an equity host under ASC 815, *Derivatives and Hedging*. In making this determination, the Company's analysis followed the whole instrument approach which compares an individual feature against the entire preferred stock instrument which includes that feature. The Company's analysis was based on a consideration of the economic characteristics and risks of each series of preferred stock. More specifically, the Company evaluated all of the stated and implied substantive terms and features, including: (i) whether the

preferred stock included redemption features, (ii) how and when any redemption features could be exercised, (iii) whether the holders of preferred stock were entitled to dividends, (iv) the voting rights of the preferred stock and (v) the existence and nature of any conversion rights. As a result of the Company's conclusion that the preferred stock represents an equity host, the conversion feature of all series of preferred stock is considered to be clearly and closely related to the associated preferred stock host instrument. Accordingly, the conversion feature of all series of preferred stock is not considered an embedded derivative that requires bifurcation.

The Company accounts for potentially beneficial conversion features under ASC 470-20, *Debt with Conversion and Other Options*. At the time of each of the issuances of convertible preferred stock, the Company's common stock into which each series of the Company's preferred stock is convertible had an estimated fair value less than the effective conversion prices of the convertible preferred stock. Therefore, there was no intrinsic value on the respective commitment dates.

Dividends

The holders of Series A, Series B, and Series C Preferred Stock are entitled to receive cumulative dividends at the rate of $0.06, $0.10, and $0.294666 per share per annum, respectively, in preference to any dividends on common stock, when, as, and if declared by the Board of Directors. These dividends are cumulative and accrue whether or not declared. As of December 31, 2012, dividends accrued but unpaid were $7.8 million for Series A Preferred Stock, $1.4 million for Series B Preferred Stock, and $5.3 million for Series C Preferred Stock. As of March 31, 2013, dividends accrued but unpaid were $8.3 million for Series A Preferred Stock, $1.5 million for Series B Preferred Stock, and $6.4 million for Series C Preferred Stock. No dividends have been declared through March 31, 2013.

Voting

The holders of Series A, Series B, and Series C Preferred Stock are entitled to the number of votes equal to the number of common shares into which the Series A, Series B, and Series C Preferred Stock are convertible.

Liquidation

The holders of the Series C Preferred Stock are entitled to receive, upon the liquidation of the Company, including certain transactions deemed to be a liquidation, proceeds in proportion to their liquidation preference. Such liquidation preference is equal to the greater of the original Series C issue price of $4.91 per share, plus all declared or accrued, but unpaid dividends or such amount per share as would have been payable had such share been converted into common stock. Subsequent to the payment of the Series C Preferred Stock liquidation preference, the holders of the Series A and B Preferred Stock would receive liquidation proceeds in proportion to their liquidation preference. Such liquidation preference is equal to the greater of the original Series A and Series B issue price of $1.00 per share and $1.70 per share, respectively, plus all declared or accrued, but unpaid dividends or such amount per share as would have been payable had such share been converted into common stock. Subsequent to the liquidation preference payments to the holders of Preferred Stock, the remaining assets of the Company would be distributed to the holders of common stock.

8. Common Stock

The voting, dividend and liquidation rights of holders of shares of Common Stock are subject to and qualified by the rights, powers and preferences of the holders of shares of Preferred Stock. The Company's Common Stock has the following characteristics:

Agios Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements (continued)

Voting

The Holders of shares of Common Stock are entitled to one vote for each share of Common Stock held at all meetings of stockholders and written actions in lieu of meetings.

Dividends

The holders of shares of Common Stock are entitled to receive dividends, if and when declared by the Board of Directors. Cash dividends may not be declared or paid to holders of Common Stock until paid on each series of outstanding Preferred Stock in accordance with their respective terms. As of March 31, 2013, no dividends have been declared or paid since the Company's inception.

Liquidation

After payment to the holders of shares of Preferred Stock of their liquidation preferences, the holders of shares of Common Stock are entitled to share ratably in the Company's assets available for distribution to stockholders, in the event of any voluntary or involuntary liquidation, dissolution or winding up of the Company or upon the occurrence of a Deemed Liquidation Event, as defined.

Reserved for Future Issuance

The Company has reserved for future issuance the following number of shares of Common Stock as of December 31, 2011, December 31, 2012 and March 31, 2013:

	December 31,		March 31,
	2011	2012	2013
Conversion of Series A Preferred Stock	12,068,682	12,068,682	12,068,682
Conversion of Series B Preferred Stock	1,887,473	1,887,473	1,887,473
Conversion of Series C Preferred Stock	5,775,409	5,775,409	5,775,409
Options to purchase Common Stock	3,879,642	5,079,642	5,079,642
	23,611,206	24,811,206	24,811,206

9. Share-Based Payments

2007 Stock Incentive Plan

The Company maintains the 2007 Stock Incentive Plan (the "Plan") for employees, directors, consultants, and advisors to the Company. The Plan provides for the grant of incentive and non-qualified stock options and restricted stock grants as determined by the Board of Directors. The Company has reserved 5,079,642 shares of common stock under the Plan, and at December 31, 2012 and March 31, 2013, the Company had 684,124 and 724,181 shares available for future issuance under the Plan, respectively. Shares of common stock issued upon exercise of stock options are generally issued from new shares of the Company. The Plan provides that the exercise price of incentive stock options cannot be less than 100% of the fair market value of the common stock on the date of the award for participants who own less than 10% of the total combined voting power of stock of the Company, and not less than 110% for participants who own more than 10% of the Company's voting power. Stock options and restricted stock granted under the Plan vest over periods as determined by the Board of Directors, which is generally 25% on the first year anniversary of the grant date and then ratably monthly thereafter. Stock options generally expire ten years from the date of grant. Restricted stock issuances and early exercise of stock options are subject to the Company's right of repurchase at the original issuance price, which right lapses over the vesting period of the stock.

Agios Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements (continued)

During the years ended December 31, 2011 and 2012, the Company granted 7,272 and 16,363 stock options to consultants and advisors of the Company, respectively. These awards are included within the following table which summarizes the activity of the Plan for the year ended December 31, 2012 and the three months ended March 31, 2013:

	Number of Stock Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding at December 31, 2011	2,693,873	$ 0.39	8.17	$ 5,249
Granted	833,036	2.34		
Exercised	(287,067)	0.47		
Forfeited	(94,298)	1.05		
Outstanding at December 31, 2012	3,145,544	0.88	7.72	15,402
Exercised	(15,569)	0.58		
Forfeited	(40,058)	2.18		
Outstanding at March 31, 2013	3,089,917	0.86	7.45	25,288
Exercisable at December 31, 2012	1,724,058	0.42	7.03	9,268
Vested and expected to vest at December 31, 2012	2,508,497	0.66	7.43	12,862
Exercisable at March 31, 2013	1,959,655	0.50	6.92	16,743
Vested and expected to vest at March 31, 2013	2,601,702	0.69	7.24	21,743

The weighted-average grant date fair value of options granted was $0.44, $2.09 and $1.87, during the years ended December 31, 2011 and 2012 and the three months ended March 31, 2012, respectively. There were no options granted during the three months ended March 31, 2013. The total intrinsic value of options exercised was $65,000, $761,000, $169,000, and $132,000 during the years ended December 31, 2011 and 2012 and the three months ended March 31, 2012 and 2013, respectively.

At March 31, 2013, the total unrecognized compensation expense related to unvested stock option awards, including estimated forfeitures, was $0.8 million, which the Company expects to recognize over a weighted-average period of approximately 1.8 years. The Company also has unrecognized stock-based compensation expense of $0.5 million related to stock options with performance-based vesting criteria that are not considered probable of achievement as of March 31, 2013; therefore the Company has not yet begun to recognize the expense on these awards.

Restricted Stock and Early Exercise of Stock Options

From time to time, upon approval by the Company's Board, certain employee option holders have been granted restricted stock and certain directors have been permitted to early exercise their stock options in exchange for cash, at which time the awards became subject to restricted stock agreements. These shares of restricted stock granted upon early exercise of the options are subject to the same vesting provisions as the original stock option awards. Accordingly, the Company has recorded the exercise proceeds from early exercises as a restricted stock liability in the consolidated balance sheets. The restricted stock liability is reclassified into stockholders' (deficit) equity as the restricted stock and options vest.

At December 31, 2011 and 2012 and March 31, 2013, there were 291,666, 160,053 and 110,053 shares of unvested restricted stock which remain subject to the Company's right of repurchase, respectively.

Unvested restricted stock activity for the years ended December 31, 2011 and 2012 and the three months ended March 31, 2013 is summarized as follows:

	Years Ended December 31,		Three Months Ended March 31, 2013
	2011	2012	
Unvested shares beginning of period	473,484	291,666	160,053
Granted	—	52,098	—
Vested	(181,818)	(183,711)	(50,000)
Forfeited	—	—	—
Unvested shares end of period	291,666	160,053	110,053

The weighted-average exercise price of restricted stock granted was $0.91 during the year ended December 31, 2012.

Performance-Based Stock Option Grants

During the years ended December 31, 2011 and 2012, the Company granted options to purchase 90,909 and 375,636, respectively, shares of common stock to employees, including executive officers, which contain both performance-based and service-based vesting criteria. Milestone events are specific to the Company's corporate goals, including but not limited to certain preclinical and clinical development milestones related to the Company's product candidates. Stock-based compensation expense associated with these performance-based stock options is recognized if the performance condition is considered probable of achievement using management's best estimates. Management has concluded that the performance-based milestones, which were primarily related to preclinical and clinical development, were not probable of achievement at December 31, 2012. As such, no stock-based compensation expense was recorded as of December 31, 2012 related to these options. During the three months ended March 31, 2013 management assessed the probability of achieving the milestones and determined that certain performance-based milestones are probable of achievement as of March 31, 2013. The Company recorded stock-based compensation expense of $172,000 during the three months ended March 31, 2013, accordingly. The remaining milestones were not deemed to be probable of achievement as of March 31, 2013.

During 2010, the Company granted stock options to consultants of the Company which contained performance-based vesting criteria and no underlying service period. Stock-based compensation expense associated with these performance-based stock options is recognized if the performance condition is considered probable of achievement using management's best estimates. During the years ended December 31, 2011 and 2012 management concluded that the milestones associated with 54,545 and 27,272 performance-based stock options, respectively, were probable of achievement and the Company began to record stock-based compensation expense, accordingly. The Company recorded $24,000 and $150,000 of stock-based compensation expense for non-employee performance-based stock options in the years ended December 31, 2011 and 2012. There was no stock-based compensation expense for non-employee performance-based stock options recorded in the three months ended March 31, 2012 and 2013 as the remaining milestones were not considered probable of achievement as of March 31, 2012 and there were no remaining unvested performance-based stock options for non-employees subsequent to December 31, 2012.

Agios Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements (continued)

Stock-Based Compensation Expense

The fair value of each stock option granted to employees is estimated on the date of grant and for non-employees on each vesting and reporting date using the Black-Scholes option-pricing model. The following table summarizes the weighted average assumptions used in calculating the fair value of the awards:

	Years Ended December 31,		Three Months Ended March 31, 2012
	2011	2012	
Risk-free interest rate	1.97%	1.09%	1.17%
Expected dividend yield	—	—	—
Expected term (in years)	6.09	6.08	6.38
Expected volatility	98.60%	97.75%	99.51%

Note: There were no stock options granted in the three months ended March 31, 2013.

Volatility

Since the Company is privately held as of the date of these consolidated financial statements, it does not have relevant historical data to support its expected volatility. As such, the Company has used a weighted-average of expected volatility based on the volatilities of a representative group of publicly-traded biopharmaceutical companies. For purposes of identifying representative companies, the Company considered characteristics such as number of product candidates in earlier stages of product development, area of therapeutic focus, length of trading history, similar vesting provisions and a similar percentage of stock options that are in-the-money. The expected volatility has been determined using a weighted-average of the historical volatilities of the representative group of companies for a period equal to the expected term of the option grant. The Company intends to continue to consistently apply this process using the same similar entities until a sufficient amount of historical information regarding the volatility of the Company's own share price becomes available or until circumstances change, such that the identified entities are no longer representative companies. In the latter case, more suitable, similar entities whose share prices are publicly available would be utilized in the calculation.

Risk-Free Rate

The risk-free rate is based on the yield curve of U.S. Treasury securities with periods commensurate with the expected term of the options being valued.

Expected Term

The Company uses the "simplified method" as prescribed by the Securities and Exchange Commission Staff Accounting Bulletin No. 107, *Share Based Payments*, to estimate the expected term of stock option grants. Under this approach, the weighted-average expected life is presumed to be the average of the contractual term (ten years) and the vesting term (generally four years) of the Company's stock options, taking into consideration multiple vesting tranches. The Company utilizes this method due to lack of historical exercise data and the plain-vanilla nature of the Company's share-based awards.

Dividends

The Company has never paid, and does not anticipate paying, any cash dividends in the foreseeable future, and therefore uses an expected dividend yield of zero in the option-pricing model.

Agios Pharmaceuticals, Inc.

Notes to Consolidated Financial Statements (continued)

Forfeitures

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. The Company based its estimate of forfeitures on data from a representative group of publicly-traded biopharmaceutical companies, as the Company does not currently have sufficient history, and records the stock-based compensation expense only on the awards that are expected to vest. To date forfeitures have been less than 5.0% of total grants.

10. Income Taxes

The provision (benefit) for income taxes is as follows for the years ended December 31, 2011 and 2012 and the three months ended March 31, 2012 and 2013 (in thousands):

	December 31,		March 31,	
	2011	2012	2012	2013
Current:				
Federal	$ 14,406	$(9,531)	$(2,139)	$190
State	3,461	—	—	—
Total current	17,867	(9,531)	(2,139)	190
Deferred:				
Federal	(10,660)	6,707	1,532	—
State	—	—	—	—
Total deferred	(10,660)	6,707	1,532	—
Total	$ 7,207	$ (2,824)	$ (607)	$190

A reconciliation of the expected income tax benefit (expense) computed using the federal statutory income tax rate to the Company's effective income tax rate is as follows for the years ended December 31, 2011 and 2012:

	December 31,	
	2011	2012
Income tax benefit computed at federal statutory tax rate	35.00%	35.00%
State taxes, net of federal benefit	3.95	7.07
Change in valuation allowance	(74.29)	(28.08)
General business credits and other credits	(2.36)	0.12
Permanent differences	(0.60)	(0.63)
Interest and penalties	(1.72)	(1.95)
Other	(3.66)	0.79
Total	(43.68)%	12.32%

During the years ended December 31, 2011 and 2012 and the three months ended March 31, 2012 and 2013, the Company had $284,000, $583,000, $38,000 and $190,000 accrued for interest and penalties related to the non-payment of U.S. federal income taxes, respectively.

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amount of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of the Company's deferred tax assets and liabilities for the years ended December 31, 2011 and 2012 are as follows (in thousands):

	2011	2012
Deferred tax assets (liabilities):		
Net operating loss carryforwards	$ —	$ 1,666
Deferred revenue	35,727	33,250
Tax credit carryforwards	—	427
Purchased intangible assets	161	158
Depreciation and amortization	(359)	(435)
Stock-based compensation	102	269
Deferred rent	190	172
Other	187	232
Total deferred tax asset	36,008	35,739
Valuation allowance	(25,349)	(31,786)
Net deferred tax asset	$ 10,659	$ 3,953

As of December 31, 2012, the Company had net operating loss carryforwards available to reduce federal and state incomes taxes of approximately $0.5 million and $28.8 million, respectively. If not utilized, these carryforwards expire at various dates through 2032. At December 31, 2012, the Company also had available research and development tax credits for federal and state income tax purposes of approximately $27,000 and $616,000, respectively.

As of December 31, 2011, the Company had utilized its net operating loss carryforwards to reduce federal and state incomes taxes of approximately $27.2 million and $26.7 million, respectively. At December 31, 2011, the Company had also utilized research and development tax credits for federal and state income tax purposes of approximately $424,000 and $344,000, respectively. During 2011, the Company conducted a study of its research and development credit carryforwards. This study resulted in an adjustment to the Company's research and development credit carryforward, as the Company concluded that the credits were not more likely than not to be realized.

Utilization of the net operating loss carryforwards and credits may be subject to annual limitations as prescribed by federal and state statutory provisions. The annual limitation may result in the expiration of net operating loss carryforwards prior to its utilization. Utilization of the NOLs and tax credit carryforwards may be subject to a substantial annual limitation due to ownership change limitations that have occurred previously or that could occur in the future, as provided by Section 382 of the Internal Revenue Code of 1986 ("Section 382"), as well as similar state provisions. Ownership changes may limit the amount of NOLs and tax credit carryforwards that can be utilized annually to offset future taxable income and tax, respectively. In general, an ownership change, as defined by Section 382, results from transactions that increase the ownership of 5% shareholders in the stock of a corporation by more than 50 percent in the aggregate over a three-year period. During 2011, the Company completed a study through December 31, 2011, to determine whether any ownership change has occurred since the Company's formation and has determined that transactions have resulted in two ownership changes, as defined by Section 382. The impact of the ownership changes have been reflected in the Company's deferred tax assets in the table above. There could be additional ownership changes in the future that could further limit the amount of NOLs and tax credit carryforwards that the Company can utilize.

As required by ASC 740, *Income Taxes* ("ASC 740"), management of the Company has evaluated the positive and negative evidence bearing upon the realizability of its deferred tax assets, which are comprised principally of timing differences related to the recognition of revenue under the Celgene Agreement for book versus tax purposes. During the year ended December 31, 2011, management determined that it was more likely than not that it would realize a portion of its deferred tax assets because of the Company's ability to carryback future losses for U.S. federal income tax purposes. As a result, the Company reversed approximately $10.7 million of the valuation allowance on its deferred tax assets in the year ended December 31, 2011, representing the amount of deferred tax assets that will be realized in 2012 and 2013, the years available for carryback. The Company utilized certain of the deferred tax assets, including net operating losses, generated in the year ended December 31, 2012 to reduce its federal income taxes payable in the year ended December 31, 2012. For the remainder of the Company's deferred tax assets, management determined that it is more likely than not that the Company may not realize the benefit and has recorded a valuation allowance of approximately $25.3 million and $31.8 million at December 31, 2011 and 2012, respectively. The valuation allowance increased by $6.4 million in the year ended December 31, 2012.

The Company applies the accounting guidance in ASC 740 related to accounting for uncertainty in income taxes. The Company's reserves related to taxes are based on a determination of whether, and how much of, a tax benefit taken by the Company in its tax filings or positions is more likely than not to be realized following resolution of any potential contingencies present related to the tax benefit. As of December 31, 2011 and 2012, and as of March 31, 2013, the Company had no unrecognized tax benefits. The Company recognizes interest and penalties related to uncertain tax positions in income tax expense.

The statute of limitations for assessment by the Internal Revenue Service (IRS) and state tax authorities is open for tax years ending December 31, 2012, 2011, 2010, and 2009 although carryforward attributes that were generated for tax years prior to 2009 may still be adjusted upon examination by the IRS or state tax authorities if they either have been, or will be, used in a future period. There are currently no federal or state audits in progress.

11. Defined Contribution Benefit Plan

The Company sponsors a 401(k) retirement plan, in which substantially all of its full-time employees are eligible to participate. Participants may contribute a percentage of their annual compensation to this plan, subject to statutory limitations. The Company did not provide any contributions to this plan during the years ended December 31, 2011 and 2012 or the three months ended March 31, 2012 and 2013.

12. Subsequent Events

a. Stock Option Awards

On April 30, 2013, the Board of Directors of the Company granted stock option awards to employees of the Company to purchase an aggregate of 613,745 shares of common stock at an exercise price of $9.05 per share. The exercise price of the options was determined pursuant to a contemporaneous valuation using the Probability Weighted Expected Return Method.

b. Reverse Stock Split

In connection with preparing for this offering, the Company's Board of Directors and stockholders approved a 1-for-2.75 reverse stock split of the Company's common stock. The reverse stock split became effective on July 11, 2013. All share and per share amounts in the consolidated financial statements and notes thereto have been retroactively adjusted for all periods presented to give effect to this reverse stock split, including reclassifying an amount equal to the reduction in par value of common stock to additional paid-in capital.

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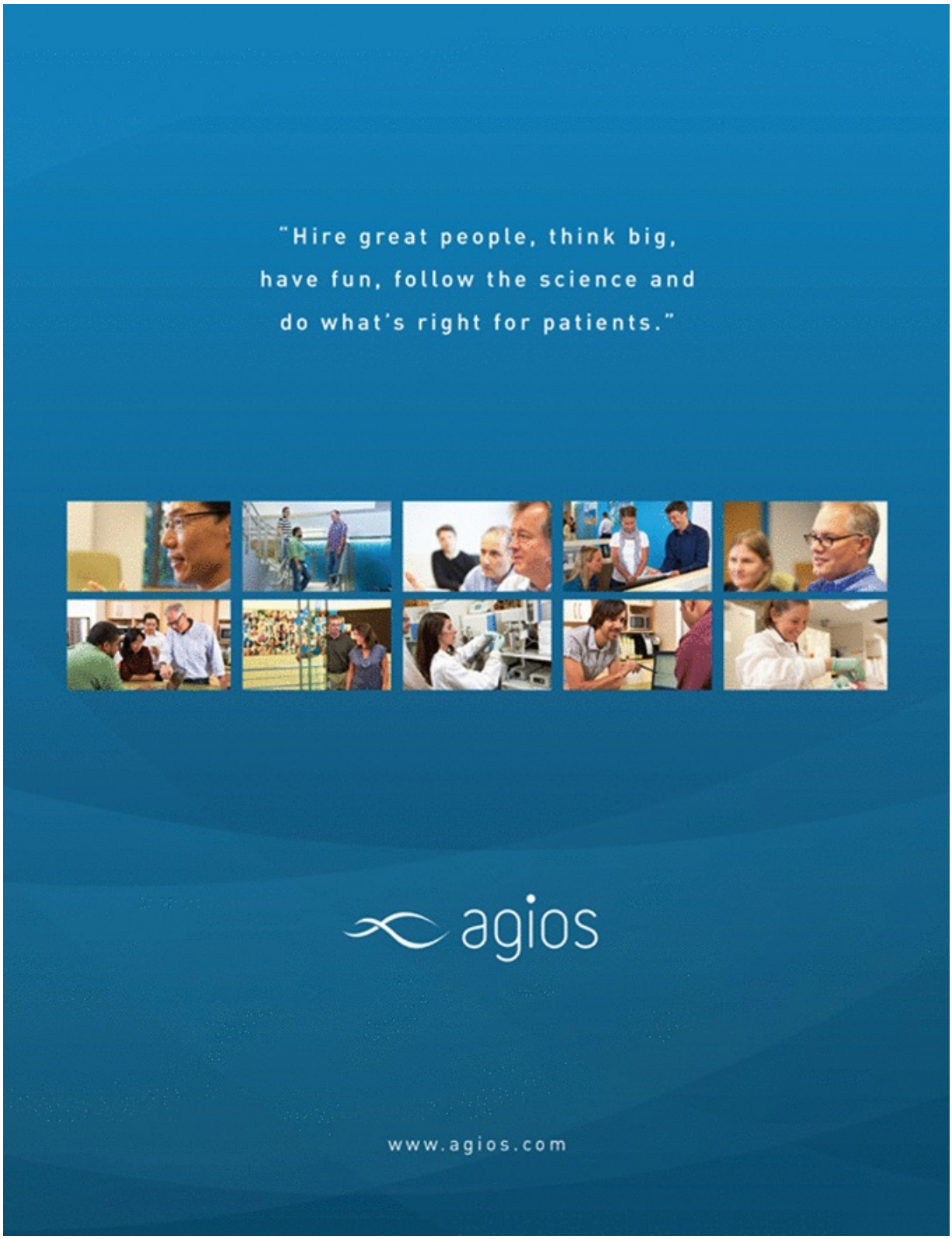

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