CODEXIS INC
Form 10-K
April 02, 2013
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K
(Mark One)

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

For the fiscal year ended: December 31, 2012

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

For the transition period from to .
Commission File No.: 001-34705

Codexis, Inc.
(Exact name of Registrant as specified in its charter)

Delaware	71-0872999
(State or other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)
200 Penobscot Drive, Redwood City, California	94063
(Address of Principal Executive Offices)	(Zip Code)

Registrant's telephone number, including area code: (650) 421-8100
Securities Registered Pursuant to Section 12(b) of the Act:

Title of Each Class:	Name of Each Exchange on which Registered:
Common Stock, par value $0.0001 per share	The NASDAQ Global Select Market

Securities Registered Pursuant to Section 12(g) of the Act: None.

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ¨ No ý
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ¨ No ý
Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ý No ¨
Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 229.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ý No ¨
Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ý

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

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Large accelerated filer	¨	Accelerated filer	ý
Non-accelerated filer	¨	Smaller reporting company	¨

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

The aggregate market value of voting common stock held by non-affiliates of Codexis as of June 29, 2012 was approximately $102.4 million based upon the closing price reported for such date on The NASDAQ Global Select Market.

As of March 22, 2013, there were 38,009,688 shares of the registrant's Common Stock, par value $0.0001 per share, outstanding.

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DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Definitive Proxy Statement to be filed with the Commission pursuant to Regulation 14A in connection with the registrant's 2013 Annual Meeting of Stockholders, to be filed subsequent to the date hereof, are incorporated by reference into Part III of this Report. Such Definitive Proxy Statement will be filed with the Securities and Exchange Commission not later than 120 days after the conclusion of the registrant's fiscal year ended December 31, 2012. Except with respect to information specifically incorporated by reference in this Form 10-K, the Proxy Statement is not deemed to be filed as part of this Form 10-K.

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

The following discussion and analysis should be read in conjunction with our audited consolidated financial statements and the related notes that appear elsewhere in this Annual Report on Form 10-K. This Annual Report on Form 10-K contains “forward-looking statements” within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, particularly in Part I, Item 1: “Business,” Part I, Item 1A: “Risk Factors” and Part 2, Item 7: “Management's Discussion and Analysis of Financial Condition and Results of Operations.” These statements are often identified by the use of words such as “may,” “will,” “expect,” “believe,” “anticipate,” “intend,” “could,” “should,” “estimate,” or “continue,” and similar expressions or variations. All statements other than statements of historical fact could be deemed forward-looking, including, but not limited to: any projections of financial information; any statements about historical results that may suggest trends for our business; any statements of the plans, strategies, and objectives of management for future operations; any statements of expectation or belief regarding future events, technology developments, our products, product sales, expenses, liquidity, cash flow, market growth rates or enforceability of our intellectual property rights and related litigation expenses; and any statements of assumptions underlying any of the foregoing. Such forward-looking statements are subject to risks, uncertainties and other factors that could cause actual results and the timing of certain events to differ materially from future results expressed or implied by such forward-looking statements. Accordingly, we caution you not to place undue reliance on these statements. Particular uncertainties that could affect future results include: our ability to achieve or maintain profitability; our ability to secure third-party funding for our advanced biofuels program; our ability to obtain substantial additional capital that may be necessary to expand our business; our ability to maintain internal control over financial reporting; charges to earnings as a result of any impairment of goodwill, intangible assets or other long-lived assets; our ability to realize the expected benefits from the reduction in force we undertook at the end of August 2012; our dependence on a limited number of customers; our customers' ability to timely pay amounts owed to us; our dependence on a limited number of products in our pharmaceutical business; our primary reliance on one contract manufacturer for commercial scale production of substantially all of our enzymes; our ability to develop and successfully commercialize new products for the pharmaceuticals market; our relationships with, and dependence on, collaborators in our principal markets; our ability to deploy our technology platform in new adjacent market spaces; our dependence on, and need to attract and retain, key management and other personnel; the success of our customers' pharmaceutical products in the market and the ability of such customers to obtain regulatory approvals for products and processes; our ability to control and to improve pharmaceutical product gross margins; the ability of Arch Pharmalabs Limited ("Arch") to effectively market pharmaceutical products manufactured using our enzymes; our ability to maintain license rights for commercial scale expressions systems for cellulases; the feasibility of commercializing biofuels and bio-based chemicals derived from cellulose; fluctuations in the price of and demand for commodities that our enzymes can be employed to produce or for substitute commodities; the availability, cost and location of renewable cellulosic biomass sources; changes to existing biofuel regulations and policies; our potential bio-based chemicals products might not be approved or accepted by our customers; our ability to independently develop, manufacture, market, sell and distribute commercial cellulase enzymes; risks associated with the international aspects of our business; our ability to integrate any businesses we may acquire with our business; our ability to accurately report our financial results in a timely manner; our ability to obtain, protect and enforce our intellectual property rights; our ability to prevent the theft or misappropriation of our biocatalysts, the genes that code for our biocatalysts, know-how or technologies; potential advantages that our competitors and potential competitors may have in securing funding or developing products; business interruptions such as earthquakes and other natural disasters; public concerns about the ethical, legal and social ramifications of genetically engineered products and processes; our ability to comply with laws and regulations; our ability to properly handle and dispose of hazardous materials used in our business; potential product liability claims; the existence of government subsidies or regulation with respect to carbon dioxide emissions; our ability to obtain and maintain governmental awards; and our ability to use our net operating loss carryforwards to offset future taxable income. For a discussion of some of the factors that could cause actual results to differ materially from our forward-looking statements, see the discussion on risk factors that appear in Part I, Item 1A: “Risk Factors” of this Annual Report on Form 10-K and other risks and uncertainties detailed in this and our other reports and filings with the Securities and Exchange Commission, or SEC. The forward-looking statements in this Annual Report on

Form 10-K represent our views as of the date of this Annual Report on Form 10-K. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we have no current intention of doing so except to the extent required by applicable law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this Annual Report on Form 10-K.

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PART I

ITEM 1. BUSINESS

Company Overview

We engineer enzymes for pharmaceutical, biofuel and chemical production. Our proven technologies enable scale-up and implementation of biocatalytic solutions to meet customer needs for rapid, cost-effective and sustainable process development, from research to manufacturing.

We have commercialized our technology and products in the pharmaceuticals market, which is our primary business focus. There are currently over 50 pharmaceutical firms using our technology, products and services in their manufacturing process development, including in the production of some of the world's bestselling and fastest growing drugs.

We are a developing our CodeXyme® cellulase enzymes to convert non-food plant material, or cellulosic biomass, into affordable sugars, which can then be converted into renewable fuels and chemicals. We are also developing our own manufacturing process for CodeXol® detergent alcohols, which are bio-based chemicals. Detergent alcohols are used to manufacture surfactants, which are key, active cleaning ingredients in consumer products such as shampoos, liquid soaps and laundry detergents. We are seeking collaboration partners to assist us with the development and commercialization of CodeXyme® cellulase enzymes and CodeXol® detergent alcohols, and we are also exploring other strategic options with respect to these products and technologies.

We create our products by applying our CodeEvolver® directed evolution technology platform, which introduces genetic mutations into microorganisms, giving rise to changes in the enzymes that they produce. Once we identify potentially beneficial mutations, we test combinations of these mutations until we have created variant enzymes that exhibit marketable performance characteristics superior to competitive products. This process allows us to make continuous, efficient improvements to the performance of our enzymes.

In this Annual Report, the “Company,” “we,” “us” and “our” refer to Codexis, Inc. and its subsidiaries on a consolidated basis.

Our Pharmaceutical Enzymes and Intermediates

We market and sell enzymes, development services and screening tools that enable novel manufacturing processes for active pharmaceutical ingredients, or APIs, and their precursor pharmaceutical intermediates. We also market and sell pharmaceutical intermediates that are manufactured using our custom enzymes. Our customers include several of the largest global pharmaceutical companies. Our pharmaceutical products and services have become the focus of our business since the termination of our collaboration with Equilon Enterprises LLC dba Shell Oil Products US, or Shell, as described in more detail below.

Our pharmaceutical products and services enable novel manufacturing processes that can lower production costs and reduce capital intensity. These products and services can provide numerous benefits to our customers, including:

- reducing the use of raw materials and intermediate products;
- reducing the number of processing steps;
- improving product yield;
- using water as a primary solvent;
- performing reactions at or near room temperature and pressure;
- eliminating the need for certain costly manufacturing equipment;
- reducing energy requirements; and
- reducing the need for late-stage purification steps.

We sell our products and services to both the generic and innovator pharmaceutical end markets. Our products and services have been adopted at various points of the pharmaceutical product lifecycle, from early-stage clinical testing to post-launch commercialization.

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CodeXyme® Cellulase Enzymes

Many of the fuels and chemicals that are in use today are derived from non-renewable petroleum resources. CodeXyme® cellulase enzymes allow these same fuels and chemicals to be made from renewable resources, such as cellulosic biomass. Fuels and chemicals produced from these types of materials and wastes are known as "second generation," "next generation," or "cellulosic" products. Today, cellulosic fuels and chemicals are not widely manufactured at commercial scale because their unit production economics have not yet been shown to be competitive with incumbent petroleum-based fuels and chemicals. We believe that CodeXyme® cellulase enzymes may help drive competitive production economics for cellulosic fuels and chemicals, thereby enabling their integration into global commodity markets.

CodeXyme® cellulase enzymes function by transforming cellulosic biomass into sugars, a process known as saccharification. The resulting sugars from saccharification can be converted into fuels and chemicals through fermentation. Our goal is to make CodeXyme® cellulase enzymes the leader in the cellulase enzyme category.

As described in more detail below under "Collaborations and License Agreements-Shell," our existing collaboration with Equilon Enterprises LLC dba Shell Oil Products US, or Shell, for the commercialization of CodeXyme® cellulase enzymes in the fuels market terminated in August 2012. As a result of the termination of the Shell collaboration, we initiated a series of cost reduction measures and refocused our business on the pharmaceuticals market. We terminated approximately 173 employees worldwide, consisting of 150 research and development staff and 23 general and administrative staff. We also closed our Singapore research and development facility.

We are seeking new collaboration partners to assist us with the development and commercialization of CodeXyme® cellulase enzymes. Moving forward with partners should allow us to focus on our primary competitive strength, which we believe is our ability to optimize the performance of CodeXyme® cellulase enzymes rapidly for varying feedstocks and process conditions. We are also exploring other strategic options for our CodeXyme® cellulase enzyme technologies.

CodeXol® Detergent Alcohols

We are also developing microorganisms that produce chemicals from cellulosic sugars. These microorganisms function as mini fermentation factories that convert sugars into specialty or commodity chemicals. Our first chemical development initiative is our bio-based CodeXol® detergent alcohols program.

Detergent alcohols are used to manufacture surfactants, an active ingredient in consumer products, such as shampoos, liquid soaps and laundry detergents. The annual global market for detergent alcohols is approximately $4 billion, which represents approximately 2 million metric tons with an average selling price, or ASP, of approximately $1,400 per ton today. Major consumer products companies such as Procter & Gamble, Unilever and Henkel purchase or produce a majority of the surfactants derived from detergent alcohols.

Currently, detergent alcohols are manufactured using two alternative processes. The process of manufacturing detergent alcohols using vegetable oils, such as palm, kernel and coconut oils, is known as the oleochemical production route. The process of manufacturing detergent alcohols using ethylene is known as the petrochemical production route. We believe that our CodeXol® detergent alcohols process, by using cellulosic sugars, has the potential to offer attractive production economics compared to incumbent oleochemical and petrochemical production routes.

We are developing our fully integrated cellulosic CodeXol® detergent alcohols manufacturing process, from feedstock to product, in collaboration with Chemtex. We believe that our CodeXol® detergent alcohols process may be used with a wide variety of cellulosic biomass, including sugarcane bagasse, wheat straw, corn stover and various energy crops such as Arundo donax. We believe that this process has the potential to decrease the manufacturing costs of CodeXol® detergent alcohols below current incumbent production costs. We also believe that in comparison to using oleochemical and petrochemical production routes, the raw materials of which raise concerns regarding deforestation, climate change and other environmental impacts, using CodeXol® detergent alcohols in their manufacturing process would better enable major consumer products companies to achieve their sustainability and corporate social responsibility goals. One example of such corporate social responsibility goal is the Sustainable Living Plan

announced by Unilever, under which Unilever is committed to sourcing 100% of its agricultural raw materials sustainably by 2020. We are seeking additional collaboration partners to assist us with the development and commercialization of CodeXol® detergent alcohols. We are also exploring other strategic options for our CodeXol® detergent alcohols technologies.

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Our Strategy

Continue growing our pharmaceutical business. We intend to pursue new collaborations in the pharmaceutical industry to integrate our products and services more deeply into drug development and manufacturing processes for clinical stage and commercially approved pharmaceutical products. As part of that effort, we will continue to market our Codex® Biocatalyst Panels and our Codex® Biocatalyst Kits aggressively to pharmaceutical companies to demonstrate the capabilities of our technology platform.

Seek partners to invest in our CodeXyme® cellulase enzyme and CodeXol® detergent alcohol programs, or identify and effect other strategic options with respect to those programs. We are currently in the process of identifying potential partners for our CodeXyme® cellulase enzyme and CodeXol® detergent alcohol programs so that we can leverage our partners' engineering, manufacturing or commercial expertise, their distribution infrastructure and their ability to fund commercial scale production facilities. This capital-light partnership model would enable us to commercialize these projects without requiring significant additional capital from us. We are also exploring other strategic options for these programs.

Explore commercial opportunities by leveraging our existing enzyme optimization technology. We intend to employ our existing enzyme optimization technology to explore new business opportunities, including in the fine chemical market. The fine chemicals market is similar to our pharmaceutical ingredients business and consists of several large market segments that we will explore for new business opportunities. Additionally, we intend to employ our existing enzyme optimization technology to develop improved therapeutic enzymes for our pharmaceutical customers

Improve our CodeEvolver® directed evolution technology platform. We intend to continue to improve our CodeEvolver® directed evolution technology platform, which may allow us to maintain a technology advantage over our customers and competitors. Improving our core technology capabilities should allow us to reduce the cost and time to develop new products for our customers.

Our Pharmaceutical Products and Services

Our Opportunity in the Pharmaceutical Market

The pharmaceutical industry continues to represent a significant market opportunity for us, and has become our primary business focus since the termination of the Shell collaboration. Pharmaceutical companies are now under significant competitive pressure both to reduce costs and to increase the speed to market for their products. To meet these pressures, pharmaceutical companies seek manufacturing processes for their new and existing drugs that reduce overall costs, simplify production and increase efficiency and product yield, while not affecting drug safety and efficacy. In addition, for products whose patents have expired, the importance of cost reduction is even higher, as the pharmaceutical manufacturers that developed those patent-protected drugs, known as innovators, compete with generics manufacturers.

The pharmaceutical product lifecycle begins with the discovery of new chemical entities and continues through preclinical and clinical development, product launch and, ultimately, patent expiration and the transition from branded to generic products. As innovators develop, produce and then market products, manufacturing priorities and processes evolve. Historically, innovators have focused on production cost reduction in the later stages of clinical development and have been reluctant to make process changes after a product has been launched. However, as pressures to reduce costs have increased, innovators have pursued cost reduction measures much earlier in the pharmaceutical product lifecycle and are increasingly looking for opportunities to improve their operating margins, including making manufacturing process changes for marketed products after the products have been launched if these changes can result in significant cost reductions. As a result, innovators are investing in new technologies to improve their manufacturing productivity and efficiency or outsourcing the manufacture of their intermediates and active pharmaceutical ingredients, or APIs.

Our Solution for the Pharmaceutical Market

Our CodeEvolver® directed evolution technology platform enables us to deliver solutions to our customers in the pharmaceutical market by developing and delivering optimized enzymes that perform chemical transformations at a lower cost and improve the efficiency and productivity of manufacturing processes. We provide value throughout the pharmaceutical product lifecycle. Our pharmaceutical products and services allow us to provide benefits to our customers in a number of ways, including:

- reducing the use of raw materials and intermediate products;
- reducing the number of processing steps;

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- improving product yield;
- using water as a primary solvent;
- performing reactions at or near room temperature and pressure;
- eliminating the need for certain costly manufacturing equipment;
- reducing energy requirements;
- reducing the need for late-stage purification steps;
- eliminating multiple steps in the manufacturing process; and
- eliminating hazardous inputs and harmful emission by-products.

Early in the product lifecycle, customers can use our products and services to achieve speed to market and to reduce manufacturing costs. If an innovator incorporates our products or processes into an FDA-approved product, we expect the innovator to continue to use these products or processes over the patent life of the approved drug.

After a product is launched, customers also use our products and services to reduce manufacturing costs. At this stage, changes in the manufacturing process originally approved by the FDA may require additional review. Typically, pharmaceutical companies will only seek FDA approval for a manufacturing change if there are substantial cost savings associated with the change. We believe that the cost savings associated with our products may lead our customers to change their manufacturing processes for approved products and, if necessary, seek FDA approval of the new processes which incorporate our enzymes. Moreover, we believe these cost savings are attractive to generics manufacturers, who compete primarily on price.

Products and Services

Codex® Biocatalyst Panels and Kits. We sell Codex® Biocatalyst Panels and Kits to customers who are engaged in both drug development and the marketing of approved drugs to allow them to screen and identify possible enzymatic manufacturing processes for their drug candidates and their marketed products. Codex® Biocatalyst Panels are tools that provide genetically diverse variants of our proprietary enzymes, which allow our customers to determine whether an enzyme produces a desired activity that is applicable to a particular process. Codex® Biocatalyst Kits provide subsets of the Panel enzymes in individual vials for the same purpose.

For compounds that are in development, Codex® Biocatalyst Panels and Kits:

- allow innovators to screen and identify possible enzymatic manufacturing processes rapidly and inexpensively for many of their drug candidates in-house, without the risks of disclosing the composition of their proprietary molecules before they have received patent protection; and
- generate data that we can use to optimize enzymes rapidly for a particular reaction, if necessary, reducing the time required to generate a manufacturing process capable of supporting clinical trials with inexpensively produced, pure drugs.

We believe that our Codex® Biocatalyst Panels and Kits have helped us build early and broad awareness of the power and utility of our technology platform, and will increasingly lead to sales of our enzymes and enzyme optimization services, as well as intermediates and APIs made using our enzymes. Over 50 customers, including leading pharmaceutical companies such as Teva, Merck, Novartis and Pfizer, have used our panels and kits. If our customers incorporate an enzymatic manufacturing process early in a product's lifecycle, they can reduce their manufacturing costs throughout that lifecycle, while we, in turn, could realize a long term revenue stream resulting from the use of our enzymes during that time. In addition, Codex® Biocatalyst Panels and Kits are increasingly used by our customers to evaluate the feasibility of changing the manufacturing process for their marketed products to an enzyme-enabled process.

Enzyme screening services. If a customer prefers, rather than subscribing to our Codex® Biocatalyst Panels or Kits to use for their own screening, they can send us their materials to test against our existing libraries of enzymes. If we detect desired activity in a specific enzyme, we can supply the customer with this enzyme or perform optimization services to improve the performance of the enzyme.

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Our screening services:

- allow innovators to screen and identify possible enzymatic manufacturing processes rapidly and inexpensively through access to our extensive enzyme libraries; and
- generate data that we can use to optimize enzymes rapidly for a particular reaction, if necessary, reducing the time required to generate a manufacturing process capable of supporting the customers' particular needs, ranging from small quantities for clinical trials to full commercial production, in all cases providing inexpensively produced, pure drugs.

We have provided screening services to numerous innovator and generic pharmaceutical manufacturers.

Enzyme optimization services. We work with our customers throughout the pharmaceutical product lifecycle to customize enzymes, resulting in optimized enzymes that have been evolved specifically to perform a desired process according to a highly selective set of specifications.

Our enzyme optimization services:

- allow innovators to improve the manufacturing process as their drug candidates progress through preclinical and clinical development, in some cases deferring or reducing the need for significant manufacturing investment until the likelihood of commercial success is more certain; and
- enable manufacturing processes that are highly efficient, inexpensive, require relatively little energy, reduce the need for hazardous reagents and reduce waste. For example, our activities with Pfizer have included developing an optimized enzymatic manufacturing process for a key intermediate that eliminates three chemical steps from the conventional chemical manufacturing process.

Enzymes. We supply varying quantities of our enzymes to pharmaceutical companies, from small to moderate quantities while they are optimizing their production processes, to larger quantities during later-stage clinical development and commercial scale drug production.

Our enzymes:

- enable innovators to manufacture products more efficiently during preclinical and clinical development using optimized enzymatic processes, with relatively low investment;
- eliminate the need for innovators to invest in the development of complex chemical synthesis routes during the development stage;
- allow innovators to achieve higher product purity during the development stage prior to investing in expensive late-stage clinical trials;
- reduce the risk of adverse effects arising from product impurities;
- allow the removal of entire steps from synthetic chemical production routes during commercial scale production, reducing raw material costs, energy requirements and the need for capital expenditures; and
- decrease the manufacturing costs for our customers.

For instance, as a part of our ongoing collaboration with Merck, we have developed an enzyme for use in a new manufacturing process for sitagliptin, the API in Merck's pharmaceutical product Januvia®. Januvia® is Merck's first-in-class medication for the treatment of Type II diabetes. We have also entered into agreements with several leading contract manufacturing organizations, or CMOs, including Royal DSM N.V., or DSM, Dishman Pharmaceuticals and Chemicals, Ltd., and AMPAC, under which these CMOs can use our enzymes in their manufacturing processes.

Intermediates and APIs. We can supply our customers with intermediates and APIs made using our enzymes throughout the drug lifecycle.

Our supply of intermediates has the following uses and benefits:

- lowers capital investment for innovators through outsourcing of manufacturing; and
- provides a source of less expensive, more pure products to innovator and generics manufacturers.

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We developed a key intermediate for boceprevir, which is Merck's hepatitis C drug. We have also developed enzymes for use in the manufacture of certain generic intermediates and APIs by various companies, including Arch Pharmalabs Limited, or Arch, and Teva Pharmaceutical Industries Ltd., or Teva. In addition, we market several intermediates and APIs for the generic equivalents of branded pharmaceutical products for sale in markets where innovators have not sought patent protection for their products and intend to sell these same intermediates and APIs for use in markets where innovators have sought patent protection when the patent protection for each product expires. For the years ended December 31, 2010, 2011 and 2012, revenues for our statin-family of products contributed approximately 15%, 24% and 24%, respectively, of our total revenues and our sales of products used in hepatitis C therapies were approximately 6%, 9% and 10%, respectively, of our total revenues for those periods.

Pharmaceutical Business Model

We typically enter into research collaborations with our pharmaceutical customers. These agreements often contain service and intellectual property provisions under which we research and develop optimized enzymes for innovator pharmaceutical companies in connection with their drug development efforts. In these collaborations, we typically receive revenues in the form of one or more of the following: up-front payments, milestone payments, payments based upon the number of full-time employee equivalents, or FTEs, engaged in related research and development activities and licensing fees and royalties.

Our pharmaceutical products include enzymes, pharmaceutical intermediates, active pharmaceutical ingredients, or APIs, and Codex® Biocatalyst Panels and Kits. We sell our products primarily to pharmaceutical manufacturers through our direct sales and business development force in the United States and Europe.

Our CodeXyme® Cellulase Enzyme Program

Industry Overview

The global economy is heavily dependent on petroleum. Many of the fuels and chemicals that are used throughout the world are derived from non-renewable petroleum and concerns about the long-term supply of petroleum and its price volatility have increased the desire to find renewable alternatives to this limited commodity. Many fuels and chemicals manufactures are looking for alternatives to non-renewable petroleum, including cellulosic biomass, as a feedstock for their products.

Fuels and chemicals derived from corn starch, sugar cane or plant oils are called “first generation” products and those derived from cellulosic biomass (such as corn stover, wheat straw and sugar cane bagasse) are known as “second generation,” “next generation” or “cellulosic” products. In order to produce a cellulosic product using fermentation, a manufacturer must first pretreat the cellulosic biomass and then introduce cellulase enzymes into the manufacturing process. Together, these steps work to break down the cellulose and hemicellulose found in the cell walls of the cellulosic biomass into sugars. This process is commonly referred to as saccharification. These sugars can then be converted into biofuels and chemicals through fermentation. Producing second generation fuels and chemicals is a more complicated process than producing first generation products. As a result, most biofuel and bio-based chemical manufacturers have chosen to develop and commercialize first generation products.

Sources of cellulosic biomass vary greatly by plant species and geographic region. One of the challenges for manufacturing cellulosic products is the need for technology that can convert the vast array of cellulosic biomass found throughout the world into fermentable sugars. Solving this challenge requires cellulosic biofuels and chemicals manufacturers to develop innovative, robust cellulase enzymes that have greater product yield, are more cost-effective, and react quickly and continually under industrial conditions. We do not believe that anyone has successfully accomplished this goal cost-effectively and at commercial scale.

CodeXyme® Cellulase Enzymes

We believe that CodeXyme® cellulase enzymes will enable the production of cellulosic fuels and bio-based chemicals cost-effectively and at commercial scale and that they may help drive competitive production economics for cellulosic fuels and chemicals, thereby enabling their integration into global commodity markets. CodeXyme® cellulase enzymes have the potential to convert a wide variety of cellulosic biomass into fermentable sugars, an important feature because the cellulosic biomass that we expect will be used to produce cellulosic products is highly variable from region to region and can change over time. For example, CodeXyme® cellulase enzymes convert both sugar cane bagasse and wheat straw to fermentable sugars. In addition, we licensed a commercial-scale enzyme production

system from Dyadic International, Inc., or Dyadic, in 2008 that we expect will enable the cost-effective production of CodeXyme® cellulase enzymes. We believe that the combination of our high-performing CodeXyme® cellulase enzymes and the ability to produce these cellulase enzymes cost-effectively at commercial

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scale, will enable us to develop a scalable, global platform that will provide us and our customers a competitive advantage in the cellulosic products market.

We collaborated with Shell to develop CodeXyme® cellulase enzymes from November 2006 through August 2012. When this collaboration ended in August 2012, we no longer received funding from Shell for development of CodeXyme® cellulase enzymes. As a result, we reduced the scope of our development activities for this project, refocused our business on the pharmaceuticals market and initiated a series of cost reduction measures, including employee terminations and the closure of our Singapore research and development facility. We are now seeking new collaboration partners to assist us with the development and commercialization of CodeXyme® cellulase enzymes. Moving forward with partners should allow us to focus on our primary competitive strength, which we believe is our ability to optimize the performance of CodeXyme® cellulase enzymes rapidly for varying feedstocks and process conditions. We are also exploring other strategic options for our CodeXyme® cellulase enzyme program.

Our CodeXol® Detergent Alcohols Program

Industry Overview

Detergent alcohols are used to manufacture surfactants, a key, active cleaning ingredient in consumer products such as shampoos, liquid soaps and laundry detergents. Sodium lauryl sulfate and ammonium lauryl sulfate are two such common surfactants. The annual global market for detergent alcohols is approximately $4 billion, which represents approximately 2 million metric tons with an ASP of approximately $1,400 per ton. Major consumer products companies, such as Procter & Gamble, Unilever and Henkel, purchase or produce a majority of the surfactants made from detergent alcohols.

Currently, detergent alcohols are manufactured using two alternative processes. The process of manufacturing detergent alcohols using vegetable oils, such as palm, kernel and coconut oils, is known as the oleochemical production route. The process of manufacturing detergent alcohols using ethylene is known as the petrochemical production route. The production economics of traditional detergent alcohol manufacturing routes are primarily based on the market prices of their respective feedstocks. Both ethylene and palm kernel oil prices have risen considerably in recent years, leading to a significant rise in the price of detergent alcohols. Between 2002 and 2008, global detergent alcohol prices rose from $2,000 per ton to over $3,000 per ton, and in early 2011, prices higher than approximately $4,000 per ton were observed for the first time in recent history before returning back to the $1,400 per ton range.

In addition to price volatility, consumer products companies face sustainability and corporate social responsibility issues with traditional detergent alcohols. The oleochemical route, which as of 2009 accounted for over two-thirds of global detergent alcohol production, has led to concerns of deforestation due to the rapid expansion of palm oil plantations to meet growing demand. The petrochemical route uses petroleum-based ethylene manufacturing processes that are also considered unsustainable. Many major consumer products companies today have adopted corporate social responsibility platforms in which they have pledged to their customers and stockholders that they will use sustainable, socially responsible materials in their commercial products. For example:

- Unilever's Sustainable Living Plan sets specific goals including halving the environmental footprint of the company's products and sourcing 100% of the company's agricultural raw materials sustainably.
- Procter & Gamble's Environmental Sustainability vision includes using 100% renewable or recycled materials for all products and packaging, and designing products that appeal to customers while maximizing conservation of resources.

CodeXol® Detergent Alcohols

CodeXol® detergent alcohols can act as a drop-in substitute for over 70% of the estimated $4 billion detergent alcohol market. We expect that CodeXol® detergent alcohols will offer advantages in feedstock price-volatility and sustainability when compared to traditional detergent alcohols.

We are developing our CodeXol® detergent alcohols manufacturing process, from feedstock to end product, in collaboration with Chemtex. Chemtex has licensed to us, on an exclusive basis in the field of detergent alcohols, its PROESA pretreatment technology, which we are integrating with CodeXyme® cellulase enzymes to create fermentable sugars. Our proprietary microorganism will then convert these sugars into CodeXol® detergent alcohols. We have agreed to use the PROESA pretreatment technology exclusively to produce CodeXol® detergent alcohols. Similarly, Chemtex has agreed to work exclusively with us in the production of cellulosic detergent alcohols. We

expect that Chemtex will pilot this manufacturing process using CodeXyme® cellulase enzymes and their PROESA pretreatment technology in 2013. Chemtex will provide

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engineering services for the design and construction of our commercial facilities for the production of CodeXol® detergent alcohols and we will market products resulting from the collaboration.

CodeXol® detergent alcohols are manufactured using a process which is amenable to various types of cellulosic biomass, including sugarcane bagasse, wheat straw, corn stover and various energy crops such as Arundo donax. We believe that this process has the potential to lower CodeXol® detergent alcohols' manufacturing costs and make them less volatile than current incumbent manufacturing costs. Additionally, CodeXol® detergent alcohols are better aligned with the sustainability and corporate social responsibility goals of major consumer products companies, like Unilever and Procter & Gamble, since it is sourced from sustainable and renewable cellulosic biomass. We are seeking additional collaboration partners to assist us with the development and commercialization of CodeXol® detergent alcohols. We are also exploring other strategic options for our CodeXol® detergent alcohols technology.

Collaborations and License Agreements

We believe that collaborations allow us to develop our products while operating our business with maximum capital efficiency. For example, by collaborating with Arch, we are able to leverage both our CodeEvolver® directed evolution technology platform and Arch's strengths in production and distribution. This allows us to focus our capital on key areas such as research and development.

Arch

We are collaborating with Arch of Mumbai, India in the supply of enzymes used in the manufacture and sale of certain specified APIs, and intermediates used in the manufacture of APIs, such as the API in atorvastatin. Arch has extensive expertise in chemical process development and scale-up, and is a leading producer of intermediates and generic APIs in India.

On November 1, 2012, we entered into an Enzyme Supply Agreement with Arch, or the New Arch Enzyme Supply Agreement, in which Arch agreed to exclusively purchase enzymes from us for use in the manufacture of certain of Arch's products and we agreed to exclusively supply, with limited exceptions, certain of our proprietary enzymes to Arch at an agreed upon price for use in such manufacture. The exclusivity may expire in certain circumstances, including if Arch fails to purchase a specified minimum quantity of enzymes from us. Under the terms of the New Arch Enzyme Supply Agreement, Arch has an obligation to use commercially reasonably efforts to market the products covered under the agreement to its customers. We have agreed not to buy or source any of the covered products from anyone other than Arch and have agreed not to sell any covered products to any of Arch's customers. The New Arch Enzyme Supply Agreement terminates on February 16, 2020, unless extended by mutual agreement of the parties or unless terminated at an earlier date in accordance with the termination provisions contained in the agreement.

The New Arch Enzyme Supply Agreement replaced four of our prior agreements with Arch: the Enzyme and Product Supply Agreement, effective as of February 16, 2010, as amended, the Memorandum of Understanding for Transfer Pricing and Royalty Calculation, effective as of February 16, 2010, as amended, the Product Supply Agreement, effective as of February 16, 2010, as amended and the Memorandum of Understanding for Transfer Pricing, effective as of February 16, 2010, as amended. These four terminated agreements are referred to as the Prior Arch Supply Agreements. The Prior Arch Supply Agreements provided that the Company would supply Arch with enzymes at an agreed upon price, and Arch would in turn manufacture certain APIs, or intermediates used in the manufacture of APIs, using those enzymes and would supply such APIs or intermediates to the Company at a formula-based or agreed upon price. The Company had the exclusive right to sell such APIs or intermediates to innovator pharmaceutical companies worldwide, generic pharmaceutical companies in the United States, Canada, Europe and Israel, and certain pharmaceutical companies in India. Arch had the exclusive right to manufacture, market and sell such APIs or intermediates to generic pharmaceutical companies in countries other than the United States, Canada, Europe and Israel, and certain other pharmaceutical companies in India. Under this collaboration, Arch owed a license royalty to us based on the volume of product they sold to us or the customers to which it sold product directly. Royalties earned from Arch under this arrangement were $752,000 and $127,000 for the twelve months ended December 31, 2011 and 2012, respectively. With the termination of the Prior Arch Supply Agreements, Arch will no longer produce APIs and intermediates for us and will no longer pay us royalties on the sale of APIs and intermediates to customers, and we will no longer have exclusive rights to market such APIs and intermediates in certain markets.

Dyadic

We have acquired access to a fungal expression system that is capable of producing enzymes at commercial scale through a license agreement with Dyadic and its affiliate in November 2008. Under the license agreement with Dyadic, we obtained a non-exclusive license relating to Dyadic's proprietary fungal expression technology for the production of enzymes. We can use these enzymes to make products in the fields of biofuels, certain pharmaceuticals, chemicals, air treatment, water treatment and

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the conversion of cellulosic biomass into fermentable sugars for use in non-fuel products. We also obtained access to specified materials of Dyadic relating to this technology. Our license is sublicenseable to Shell in the field of biofuels, and sublicenseable to third parties in the non-biofuels fields of certain pharmaceuticals, chemicals, air treatment, water treatment and the conversion of cellulosic biomass into fermentable sugars for non-fuel products. Each party agreed that neither it nor its affiliates or sublicensees will assert any claim of infringement of any patent covering improvements to the Dyadic materials that were made by that party or its affiliates or sublicensees against the other party, or its affiliates, sublicensees, successors, distributors, or customers. We agreed to pay Dyadic certain license issuance fees, milestone payments, and fees based on volume of enzyme products sold or manufactured using this Dyadic technology. We have the right to terminate the license agreement at will upon notice after payment of the license issuance fees. Either party has the right to terminate the license agreement for a material breach of the other party that is uncured within a period of time after notice. Dyadic has the right to terminate our licenses under the license agreement if we challenge the validity of any of the patents licensed under the license agreement. Our licenses, and access to Dyadic's materials, under the license agreement will terminate as a result of any termination of the license agreement other than due to Dyadic's material breach.

Shell

From November 2006 to August 2012, we collaborated with Shell to develop commercially viable fuels from cellulosic biomass. In this collaboration, we agreed to use our proprietary technology platform to discover and develop enzymes and microorganisms for use in converting cellulosic biomass into biofuels and related products. Shell had an obligation to fund us at specified rates for each full-time employee equivalent, or FTE, which as of 2012 were equal to $460,000 on an annual basis for each FTE in the United States and $399,000 on an annual basis for each FTE in Hungary. As of August 31, 2012, the number of FTEs assigned by us to perform our obligations under the Research Agreement was 116. For the year ended December 31, 2012, Shell accounted for 51% of our total revenues.

In September 2012, we entered into a license agreement, or the New Shell Agreement, with Shell. The New Shell Agreement terminated our collaboration with Shell effective August 31, 2012. Pursuant to the terms of the New Shell Agreement, Shell paid us $7.5 million as full, complete and final satisfaction of amounts payable by Shell with respect to FTEs and any milestones achieved or achievable by us our existing Amended and Restated Collaboration Agreement, effective November 1, 2006, as amended, or the Shell Research Agreement. We have no further obligations to Shell under the Shell Research Agreement to provide any FTEs to perform work under or after the collaboration and Shell correspondingly has no future obligations to us under the Shell Research Agreement to provide funding for FTEs to perform work under or after the collaboration. We remain eligible to receive a one-time $3 million milestone payment under the Shell Research Agreement upon the first sale by Shell of a product in the field of converting cellulosic biomass into fermentable sugars in Brazil, or in the fields of converting fermentable sugars derived from biomass into liquid fuel or liquid fuel additives or into lubricants.

The New Shell Agreement also amended our existing Amended and Restated License Agreement, effective November 1, 2006, as amended, with Shell, or the Shell License Agreement.

Under the New Shell Agreement, Shell granted us a royalty-bearing, non-exclusive rights and licenses to develop, manufacture, use and sell biocatalysts and microbes in the field of converting cellulosic biomass into fermentable sugars on a worldwide basis, except for Brazil, where such sugars are converted into liquid fuels, fuel additives or lubricants. This field is referred to as the Field of Use. Raízen Energia Participações S.A., or Raízen, holds the exclusive rights to use our biocatalysts and microbes for converting cellulosic biomass into fermentable sugars in Brazil, where such sugars are converted into ethanol. Following the date on which we, our affiliates or our customers produce sugars using biocatalysts in the Field of Use sufficient to produce 30,000,000 gallons of liquid fuel, we will be required to pay Shell a royalty on our sales to third parties of biocatalysts and microbes in the Field of Use, equal to a low single-digit percentage of net sales and we will also be required to pay Shell a royalty on the use by us or our affiliates of biocatalysts in the Field of Use, equal to a low single-digit percentage of our applicable net sales of such biocatalysts or microbes or such amounts as are otherwise agreed by us and Shell. Shell is also entitled to discounted

pricing under the New Shell Agreement for biocatalysts purchased from us by Shell for use in the Field of Use, but we are under no obligation to sell such biocatalysts to Shell.

Shell has also agreed not to sell any biocatalysts arising out of its collaboration with us to any third parties in the Field of Use, provided that such biocatalysts constitute improvements to any and all biocatalysts that are derived from technology developed under our separate collaboration with Shell, Shell Chemicals Canada Limited and Iogen Energy Corporation, or Iogen, and such improvements are made outside of that separate collaboration.

Under the New Shell Agreement, we also granted Shell a non-exclusive, royalty-free license to manufacture, use and import, solely for the use of Shell and its affiliates, (i) enzymes developed by us during the ten year period following August 31, 2012 outside of the Shell Research Agreement for use in the Field of Use and (ii) improvements to any microbe developed by us

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during the ten year period following August 31, 2012 outside of the Shell Research Agreement that is derivative of an identified microbe for use in the Field of Use. Shell remains subject to existing royalty obligations to us for future sales of products covered by the intellectual property and technology that remain exclusively licensed to Shell under the Shell License Agreement, on the terms and subject to the conditions contained in the Shell License Agreement. The New Shell Agreement has a term that commences August 31, 2012 and continues until the later of August 31, 2032 or the date of the last to expire of patent rights included in the Shell and Codexis collaboration that claim a biocatalyst or a microbe for use in the Field of Use.

We remain party to a separate Collaborative Research and License Agreement, effective as of July 10, 2009, with Shell and Iogen under which we agreed to collaborate with Iogen and Shell to develop technology relating to the conversion of cellulosic biomass to ethanol. The research term of the collaboration with Shell and Iogen ended in June 2012, while the collaboration term remains in effect; however, there is no collaborative activity continuing among the parties.

Technology

We engineer custom enzymes and microorganisms, which we sometimes refer to as biocatalysts. In simple terms, our enzymes and microorganisms initiate or accelerate chemical reactions. We use our CodeEvolver® directed evolution technology platform, which includes enzyme engineering, metabolic pathway engineering and fermentation microbe improvement, to develop novel enzymes and microorganisms that enable industrial biocatalytic reactions and fermentations. Our technology platform has enabled commercially viable products and processes for the manufacture of pharmaceutical intermediates, and we apply our technology platform to develop CodeXyme® cellulase enzymes and CodeXol® detergent alcohols.

Our approach to developing commercially viable biocatalytic processes begins by conceptually designing the most cost-effective and practical manufacturing process for a targeted product. We then develop optimized biocatalysts to enable that process design, using our directed evolution technology, including screening and validating biocatalysts under relevant conditions. Typical design criteria include stability in the desired reaction conditions, biocatalyst activity and productivity (yield), ease of product isolation, product purity and cost. Alternative approaches to biocatalytic process development typically involve designing and engineering the biocatalytic processes around shortcomings of available biocatalysts, including, for example, biocatalyst immobilization (for stability and/or reuse), special equipment and costly product isolation and purification methods. We circumvent the need for these types of costly process design features by optimizing the biocatalyst for fitness in the desired process environment. As a result, we enable and develop cost-efficient processes that typically are relatively simple to run in conventional manufacturing equipment. This also allows for the efficient technical transfer of our process to our manufacturing partners.

The successful embodiment of our CodeEvolver® directed evolution technology platform in commercial manufacturing processes requires well-integrated expertise in a number of technical disciplines. In addition to those directly involved in practicing our directed evolution technologies, such as molecular biology, enzymology, microbiology, cellular engineering, metabolic engineering, bioinformatics, biochemistry, and high throughput analytical chemistry, our process development projects also involve integrated expertise in organic chemistry, chemical process development, chemical engineering, fermentation process development, and fermentation engineering. Our integrated, multi-disciplinary approach to biocatalyst and process development is a critical success factor for our company.

Enzyme Optimization Overview

The enzyme optimization process starts by identifying genes that code for enzymes known to have the general type of catalytic reactivity for a desired chemical reaction. Typically, we identify gene sequences in published databases and then synthesize candidate genes having those sequences. Using a variety of biotechnology tools, we diversify these genes by introducing mutations, giving rise to changes in the enzymes for which they encode. The methods for diversifying these genes, and types of diversity being tested, often vary over the course of an enzyme optimization program. For finding initial diversity, methods typically include random mutagenesis and site-directed (included structure-guided) mutagenesis. We also test mutational variations that distinguish related enzymes among different organisms. Once we have identified potentially beneficial mutations, we test combinations of these mutations in

libraries made using our proprietary gene recombination methodologies, gene shuffling and multiplexed gene SOEing, or Splicing by Overlap Extension.

With our proprietary gene shuffling methodology, we generate libraries of genes that have random combinations of the mutations we are testing. The pool of genes is used to transform host cells, which entails introducing the various genes, one by one, into host cells. These cells are then segregated and grown into colonies. Cells from individual colonies are cultured in high throughput to produce the enzyme encoded by the shuffled gene in those cells. The enzymes are then screened in high throughput using test conditions relevant to the desired process. The screening results identify individual shuffled genes that

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produce improved enzymes having combinations of beneficial mutations and weed out enzymes having detrimental ones. Using different test conditions and/or different analytical methods, we can identify variant enzymes that exhibit various improved performance characteristics, such as stability, activity and selectivity, under conditions relevant to the desired chemical process.

In the next step in our optimization process, we use our proprietary software tool, ProSAR™, to analyze protein sequence-activity relationships. ProSAR™ aids in identifying specific gene and enzyme mutations that are beneficial, neutral or detrimental with respect to the desired performance characteristics. Earlier directed evolution methods did not separately evaluate individual mutations in libraries of variants which carry multiple mutations, where beneficial and detrimental performance characteristics may be mixed in an individual gene or enzyme. Capitalizing on the advent of inexpensive gene sequencing, we are able to determine which particular mutations are present in the genes and proteins we have screened. Our ProSAR™ bioinformatics software relates the screening results to the mutations and ranks the individual mutations with regard to their degree of benefit or detriment, relative to whichever process parameter(s) the screening tested. Using that information, we can bias the pool of mutational diversity in the next iteration to further the accumulation of beneficial diversity and cancel out detrimental diversity in the individual genes in the resulting shuffled library. The ProSAR™ results also help us develop ideas about new diversity to test. ProSAR™, combined with efficient gene synthesis and high quality library generation methods, has led to a significant increase in the efficiency and speed of enzyme improvement and optimization.

In another step of our optimization process, we take the best variants we have identified and prepare enough of each to test in the desired chemical process at laboratory scale, for in-process confirmation. This optimization routine is done iteratively, typically adding new diversity to the pool in each iteration. The gene that codes for the best performing enzyme in one iteration is used as the starting gene for the next iteration of shuffling and screening. As the enzymes improve over these iterations, the screening conditions are made increasingly more stringent. In this way, enzymes are rapidly optimized until all in-process performance requirements have been achieved and the economic objectives for the desired process have been met.

Multiplexed gene SOEing is our proprietary methodology for rapidly generating gene variants. Using multiplexed gene SOEing, we rapidly generate collections of individual gene variants that have predetermined, as opposed to random, combinations of mutations we are testing. It is based on a biotechnology technique, which we refer to as SOEing, generally used to make a hybrid, or spliced, gene from fragments of two genes and/or to introduce a specific mutation into a splice between fragments of one gene. We have automated the process to make robotically, in parallel, one hundred to several hundred variants, each with a predetermined combination of the mutations we are testing. The variants are introduced into host cells, and the encoded enzyme is produced and screened in high throughput, as described above.

Using multiplexed gene SOEing, we can test many mutations and combinations thereof in parallel, and because the mutation incorporation is controlled and predetermined before screening, as opposed to random incorporation and selection after screening, the resulting data set can be more optimal for ProSAR™ analysis.

We believe using multiplexed gene SOEing to survey many mutations quickly, followed by ProSAR™-driven shuffling of beneficial mutations, is a particularly effective approach, providing rapid gains in enzyme performance.

Codex® Biocatalyst Panels and Kits

Codex® Biocatalyst Panels were initially developed to speed our own internal process for identifying enzymes with desired characteristics for further optimization. Each Codex® Biocatalyst Panel is comprised of variants of one or more enzymes that catalyze one type of a generally useful chemical reaction. We assemble, on one or more multi-well sample plates, variants of a parent enzyme that we pre-optimize for stability in industrial chemical processes and for ready manufacturability. The variants are diversified to react to a variety of chemical structures that are susceptible to that type of chemical reaction.

Either we or our innovator pharmaceutical customers use the Codex® Biocatalyst Panels to screen a new chemical structure against the assembled variants to identify variants that react with the new chemical structure rapidly. For some new structures, a variant on the panel could enable production of the desired product. We can also analyze the data from the panel screen using ProSAR™ to identify the mutations that are beneficial for the reaction of the new

structure and further optimize the enzyme as needed using the enzyme optimization techniques described above. In cases where a customer wishes to screen a proprietary new chemical structure itself, we can produce a custom panel of new variants on a sample plate produced by multiplexed gene SOEing.

In 2010, we launched Codex® Screening Kits as an alternative format to provide our enzymes to pharmaceutical development laboratories that are not equipped to use multi-well sample plates. The enzymes are instead individually provided in vials for the researchers to sample. As of December 31, 2012, Codex® Screening Kits were in use or evaluation in manufacturing process development at over 50 pharmaceutical companies worldwide.

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Microbe Optimization using Gene Optimization

For fermentation microbes, we enhance metabolic pathways by using gene optimization to improve the production and/or productivity of one or more enzymes in a series of in vivo reactions that make a desired product. We optimize the gene/enzyme as described above using either in vitro or in vivo screening. For fermentation applications, the microbes containing the improved gene(s) are directly evaluated in laboratory scale fermenters.

The metabolic pathway may naturally exist in the microbe, but productivity and/or selectivity improvements are needed to produce more of the desired natural product and/or less of an undesired by-product economically. We can also introduce a new metabolic pathway to produce a desired product using our gene shuffling technology in combination with synthetic biology, a type of metabolic engineering in which new genes are introduced into a microbe.

Our gene/enzyme optimization methodologies can be used to optimize fermentation microbes, including optimization of:

- native and introduced (non-native) cellulase genes for increased productivity in our cellulase production microbes;
- an introduced (non-native) pathway in yeast for the conversion of xylose, a cellulose-derived sugar, to ethanol; and
- an introduced (non-native) pathway in a microbe for the production of CodeXol® detergent alcohols.

Microbe Optimization using Whole Genome Shuffling

In addition to our gene optimization technology for enzymes, we have another complimentary technology in our platform for the optimization of fermentation microbes called Whole Genome Shuffling. Whole Genome Shuffling allows us to improve the performance of a fermentation microbe by shuffling unidentified mutations in unidentified genes across the genome. We start with a diversity of mutational variants of a fermentation organism, generated by conventional means such as random mutagenesis. Our Whole Genome Shuffling involves introducing the entire genome of two or more such cells into a single cell, in which the genetic machinery of the combined cell recombines, or shuffles, the genomes. In one method, this is accomplished by protoplast fusion, in which the cell walls are removed to leave the cells' contents contained only by their cell membranes. The cell membranes of these protoplasts in the diverse population are induced to fuse together into fusants containing the genome of two or more of the parent cells. From these fusants, we regenerate normal cells, each with one copy of a hybridized genome. Microbial colonies are then grown and screened for their performance in the fermentative production of the desired product. This process can be repeated, including with the introduction of new mutations, until the desired performance in the fermentation process is achieved. One of our collaborators is operating a fermentation process for a generic pharmaceutical product using microbes we developed by Whole Genome Shuffling.

We are using our Whole Genome Shuffling technology in our CodeXyme® cellulase enzyme program and our CodeXol® detergent alcohols program to optimize fermentation microbes, including optimization of:

- enzyme production hosts for increased production of cellulase enzymes; and
- our detergent alcohol producing strain for increased productivity.

Metabolic Engineering and Synthetic Biology

In addition to our proprietary enzyme and microbe optimization technologies, we have built expert capabilities in a suite of new metabolic engineering technologies for the development and optimization of fermentation microbes. These technologies are generally applicable to our pathway and strain engineering programs. Genomics, transcriptomics, proteomics and metabolomics all provide more in-depth analyses of the metabolic functioning of fermentation microbes, and differences between variants, to guide further improvements. In many cases, these analyses help to identify enzymes that need to be modified (removed, increased, stabilized or otherwise modified) in order to increase the overall productivity and performance of the strain.

Synthetic biology involves the design, synthesis and introduction of new genetic programming to organisms for new biological functions. This field has rapidly developed in recent years as DNA synthesis and sequencing costs have rapidly dropped. Using synthetic biology, we are taking advantage of the publicly available gene and genome sequence information in our gene and metabolic pathway optimization projects. This information is being leveraged by our ProSAR™ software and multiplexed gene SOEing methodologies.

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Intellectual Property

Our success depends in large part on our ability to protect our proprietary products and technology under patent, copyright, trademark and trade secret laws. We also rely heavily on confidential disclosure agreements for further protection of our proprietary products and technologies. Protection of our technologies is important for us to offer our customers and partners proprietary services and products that are not available from our competitors, and to exclude our competitors from practicing technology that we have developed or exclusively licensed from other parties. For example, our ability to supply innovator pharmaceutical manufacturers depends on our ability to supply proprietary enzymes or methods for making pharmaceutical intermediates or APIs that are not available from our competitors. Likewise, in the generic pharmaceutical area, proprietary protection, through patent, trade secret or other protection of our enzymes and methods of producing a pharmaceutical product is important for us and our customers to maintain a lower cost production advantage over competitors. As of December 31, 2012, we owned or controlled approximately 314 issued patents and approximately 338 pending patent applications in the United States and in various foreign jurisdictions. These patents and patent applications are directed to our enabling technologies and specific methods and products that support our business in the pharmaceutical and bioindustrial markets. The earliest that any of our intellectual property rights will expire is 2014. The issued patents covering our fundamental shuffling technologies have terms ending as late as 2019. Our United States intellectual property rights directed to our second generation enabling technologies have terms that expire from 2021 to 2024. We continue to file new patent applications, for which terms generally extend 20 years from the filing date in the United States.

In October 2010, we acquired substantially all of the patents and other intellectual property rights associated with Maxygen, Inc.'s, or Maxygen, directed evolution technology, known as the MolecularBreeding™ technology platform, including patents, trademarks, copyrights, software and certain assumed contracts. Prior to this transaction, we and Maxygen were parties to a license agreement pursuant to which Maxygen granted us a worldwide, exclusive license to certain Maxygen intellectual property related to the use of directed evolution technology in a variety of fields of use. Since we now own substantially all of the intellectual property rights subject to the original license, the original license with Maxygen has been terminated. The intellectual property rights and assets that we acquired from Maxygen will continue to be subject to existing license rights previously granted by Maxygen to third parties, including Perseid Therapeutics LLC, or Perseid, and to Novozymes A/S, or Novozymes. Perseid retains exclusive licenses to use the intellectual property for the discovery, research and development of protein pharmaceuticals. We and Novozymes enjoy co-exclusive rights in certain fields, including biofuels. Novozymes did not receive a license to all of the rights we are using in biofuels applications and which we believe are critical to pursuing such applications. Novozymes also has exclusive rights to certain of the intellectual property that we acquired from Maxygen in certain limited fields, including development, production and sales of industrial proteins for use in processes for textile, garment, leather, wood and paper production, certain starch, food and animal feed production, certain personal care products, oil drilling, dyestuffs and dyeing and electronics industry waste water treatment.

As part of the transaction with Maxygen, we entered into a new license agreement with Maxygen, pursuant to which we granted to Maxygen certain license rights to the intellectual property assets that we acquired to the extent necessary for Maxygen to fulfill its contractual obligations under the license agreements retained by Maxygen.

We will continue to file and prosecute patent applications and maintain trade secrets in an ongoing effort to protect our intellectual property. It is possible that our current patents, or patents which we may later acquire, may be successfully challenged or invalidated in whole or in part. It is also possible that we may not obtain issued patents from our pending patent applications or other inventions we seek to protect. We sometimes permit certain intellectual property to lapse or go abandoned under appropriate circumstances. Due to uncertainties inherent in prosecuting patent applications, sometimes patent applications are rejected and we subsequently abandon them. It is also possible that we may develop proprietary products or technologies in the future that are not patentable or that the patents of others will limit or altogether preclude our ability to do business. In addition, any patent issued to us may provide us with little or no competitive advantage, in which case we may abandon such patent or license it to another entity.

Our registered and pending United States and foreign trademarks include Codexis®, Codex®, CodeEvolver®, CodeXporter®, CodeXol®, CodeXyme®, Powered by CodeEvolver™, Driving the New Sugar Economy™, We're Codexis. Proven Products. Real Results™, Bringing Life to Chemistry, and a Codexis and design mark (i.e., the Codexis logo).

Our means of protecting our proprietary rights may not be adequate and our competitors may independently develop technology or products that are similar to ours or that compete with ours. Patent, trademark, and trade secret laws afford only limited protection for our technology platform and products. The laws of many countries do not protect our proprietary rights to as great an extent as do the laws of the United States. Despite our efforts to protect our proprietary rights, unauthorized parties have in the past attempted, and may in the future attempt, to operate under aspects of our intellectual property or products or to obtain and use information that we regard as proprietary. Third parties may also design around our proprietary rights, which may render our protected technology and products less valuable, if the design around is favorably received in the marketplace.

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In addition, if any of our products or technology is covered by third-party patents or other intellectual property rights, we could be subject to various legal actions. We cannot assure you that our technology platform and products do not infringe patents held by others or that they will not in the future.

Litigation may be necessary to enforce our intellectual property rights, to protect our trade secrets, to determine the validity and scope of the proprietary rights of others, or to defend against claims of infringement, invalidity, misappropriation, or other claims. Any such litigation could result in substantial costs and diversion of our resources. Moreover, any settlement of or adverse judgment resulting from such litigation could require us to obtain a license to continue to make, use or sell the products or technology that is the subject of the claim, or otherwise restrict or prohibit our use of the technology.

Competition

Overview

We are a leader in the field of directed molecular evolution of biocatalysts. We are aware that other companies, including DSM, E.I. DuPont De Nemours and Company, or DuPont, and Vercipia Biofuels, an affiliate of BP p.l.c., have alternative methods for obtaining and generating genetic diversity or use mutagenesis techniques to produce genetic diversity. Academic institutions such as the California Institute of Technology, the Max Planck Institute and the Center for Fundamental and Applied Molecular Evolution (FAME), a jointly sponsored initiative between Emory University and Georgia Institute of Technology, are also working in this field. This field is highly competitive and companies and academic and research institutions are actively seeking to develop technologies that could be competitive with our technologies.

We are aware that other companies, organizations and persons have developed technologies that appear to have some similarities to our patented proprietary technologies. In addition, academic institutions are also working in this field. Technological developments by others may result in our products and technologies, as well as products developed by our customers using our biocatalysts, becoming obsolete. We monitor publications and patents that relate to directed molecular evolution to be aware of developments in the field and evaluate appropriate courses of action in relation to these developments.

Many of our competitors have substantially greater manufacturing, financial, research and development, personnel and marketing resources than we do. In addition, certain of our competitors may also benefit from local government subsidies and other incentives that are not available to us. As a result, our competitors may be able to develop competing and/or superior technologies and processes, and compete more aggressively and sustain that competition over a longer period of time than we could. Our technologies and products may be rendered obsolete or uneconomical by technological advances or entirely different approaches developed by one or more of our competitors. As more companies develop new intellectual property in our markets, the possibility of a competitor acquiring patent or other rights that may limit our products or potential products increases, which could lead to litigation.

We also face differing forms of competition in our various markets, as set forth below:

Pharmaceuticals

Our primary competitors in the pharmaceutical market are companies using conventional, non-enzymatic processes to manufacture pharmaceutical intermediates and APIs that compete in the marketplace with our enzymatically manufactured products. The principal methods of competition and competitive differentiation in this market are product quality and performance, including manufacturing yield and safety and environmental benefits, speed of delivery of product and price. The market for the manufacture and supply of APIs and intermediates is large with many established companies. These companies include many of our large innovator and generic pharmaceutical customers, such as Merck, Pfizer, and Teva, who have significant internal research and development efforts directed at developing processes to manufacture APIs and intermediates. The processes used by these companies include classical conventional organic chemistry reactions, chemo catalysis reactions catalyzed by chemical catalysts, or biocatalytic routes using commercially available enzymes, or combinations thereof. Our manufacturing processes must compete with these internally developed routes. Additionally, there are many large well-established fine chemical manufacturing companies that compete to supply pharmaceutical intermediate and APIs to our customers, such as DSM, BASF Corporation and Lonza Group Ltd. Finally, we face increasing competition from generic pharmaceutical manufacturers in low cost centers such as India and China.

In addition to competition from companies manufacturing intermediates and APIs, we face competition from companies that sell enzymes for use in the pharmaceutical market. The market for supplying enzymes for use in pharmaceutical manufacturing is quite fragmented. There is competition from large industrial enzyme companies, such as Novozymes and Amano Enzyme Inc., whose industrial enzymes (for detergents, for example) are occasionally used in pharmaceutical processes. There is also competition in this area from several small European companies with relatively limited product offerings comprised primarily

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of naturally occurring enzymes. In addition to these enzyme supply companies, there is a separate group of small companies, also predominately in Europe, that offers enzyme optimization services.

We believe that our principal advantage is our ability to rapidly deliver customized enzyme products for existing and new intermediates and APIs in the pharmaceuticals market. This capability has allowed us to create a breadth of products with improved performance characteristics including, for example, activity, stability, and activity on a range of substrates, compared to traditional chemistry-based manufacturing processes and naturally occurring biocatalysts. We believe that our directed evolution technology provides substantially superior results, in shorter time frames, than companies offering competing biocatalyst development services.

Cellulases

Many established companies are developing cellulases that could potentially compete with CodeXyme® cellulase enzymes, including:

- Novozymes, which has partnered with Gruppo Mossi & Ghisolfi, or M&G, in Italy to be the cellulase supplier to a commercial scale cellulosic ethanol plant being built by M&G;
- DuPont, which is marketing a line of cellulases to convert cellulosic biomass into sugar; and
- DSM, which is developing cellulase enzymes and has formed a joint venture with POET, POET-DSM, to construct a facility to produce cellulosic ethanol in Emmetsburg, Iowa.

Although few companies are currently converting cellulosic biomass into fermentable sugars on a commercial scale, many of our competitors have been active in this area for many years, have invested significant resources in this effort, and have extensive patent portfolios regarding the relevant biocatalysts and related processes. In addition, several companies are focused on developing non-biocatalytic, thermochemical processes to convert cellulosic biomass into fermentable sugars. For example, Coskata, Inc. is developing a hybrid thermochemical-biocatalytic process to produce ethanol from a variety of feedstocks. Our cellulases will need to be competitive with all of these alternative products on price and performance. New companies continue to enter this marketplace. Many of these companies are actively developing and applying for intellectual property rights, including patent rights, in this space.

Detergent Alcohols

We announced CodeXol® detergent alcohols in 2011. We face competition in this market from Sasol, Shell, BASF, Kao Corporation and Liaoning Huaxing, all of which have been active in the detergent alcohol marketplace for many years and have an established history with customers. We also face competition from smaller companies that are developing biological routes to detergent alcohols, such as LS9, Inc.

Operations

We conduct substantial operations outside of the United States. We have facilities in Redwood City, California and Budapest, Hungary. As of December 31, 2012, we employed 154 people worldwide, with 114 of our employees located in Redwood City. Please see Note 13 to our consolidated financial statements appearing in Item 8 of this Annual Report on Form 10-K for a description of our revenue and long-lived assets outside of the United States.

Our corporate headquarters is located in Redwood City, California and provides general administrative support to our business and is the center of our manufacturing and research and development operations. In 2008, we established our facilities in Budapest, Hungary to create a research and development center for microbial biocatalyst improvement and fermentation development and to reduce our research and development costs. Hungary also has a highly educated and skilled work force that leverages the long history of fermentation development in Eastern Europe. We closed our Singapore research and development facility in 2012 as a result of restructuring activities following the termination of the Shell collaboration in August 2012.

Our research and development operations include efforts directed towards biocatalyst evolution, bioprocess development, cellular engineering, biocatalyst screening, metabolites, strain improvement, fermentation development and process engineering. We conduct enzyme evolution, enzyme production development, microbial bioprocess development, cellular engineering, microbial evolution and process engineering evaluations and design primarily at our headquarters in Redwood City. Our facility in Hungary collaborates with our headquarters in Redwood City in research and development activities relating to microbe improvement and is our center of excellence for strain and fermentation development.

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We have limited internal manufacturing capacity at our headquarters in Redwood City. We expect to rely on third-party manufacturers for commercial production of our biocatalysts for the foreseeable future. Our in-house manufacturing is dedicated to producing both Codex® Biocatalyst Panels and Kits and enzymes for use by our customers in pilot scale production. We also supply initial commercial quantities of biocatalysts for use by our collaborators to produce pharmaceutical intermediates and manufacture biocatalysts that we sell.

We rely on a contract manufacturer, Lactosan GmbH & Co. KG, or Lactosan, to manufacture substantially all of the commercial enzymes used in our pharmaceutical business. We have qualified other contract manufacturers to manufacture biocatalysts for our pharmaceutical business, but we do not currently rely on them for any of our supply requirements. We also contract with suppliers in Austria, Germany, Italy and India.

We intend to rely on contract manufacturers for the production of CodeXyme® cellulase enzymes for our biofuels and bio-based chemical businesses. We expect to start a 1,500 liter CodeXol® detergent alcohols demonstration facility in Rivalta, Italy with our partner, Chemtex.

Customers

We rely on a limited number of customers for the majority of our current revenues. For the years ended December 31, 2010, 2011 and 2012, our top five customers accounted for 85%, 77% and 81% of our total revenues, respectively. Customers with revenues of 10% or more of our total revenues in any of the past three fiscal years consist of the following:

	Percentage of Total Revenues For The Years Ended December 31,		
	2012	2011	2010
Customers			
Shell	51 %	51 %	62 %
Merck	13 %	10 %	10 %

Following the termination of our Shell collaboration effective August 31, 2012, we do not expect to receive future collaboration revenues from Shell and do not anticipate that Shell will represent a significant portion of our total revenue in future periods.

Employees

As of December 31, 2012, we had 154 employees worldwide. Of these employees, 99 were engaged in research and development, 20 were engaged in manufacturing and operations, and 35 were engaged in general and administrative activities, respectively. None of our employees are represented by a labor union, and we consider our employee relations to be good.

Corporate and Available Information

Our principal corporate offices are located at 200 Penobscot Drive, Redwood City, California 94063 and our telephone number is (650) 421-8100. We were incorporated in Delaware in January 2002. Our internet address is www.codexis.com. We make available on our website, free of charge, our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and any amendments to those reports, as soon as reasonably practicable after we electronically file such materials with, or furnish it to, the Securities Exchange Commission, or the SEC. Our SEC reports can be accessed through the Investor Relations section of our internet website. The information found on our internet website is not part of this or any other report we file with or furnish to the SEC.

ITEM 1A. RISK FACTORS

You should carefully consider the risks described below together with the other information set forth in this Annual Report on Form 10-K, which could materially affect our business, financial condition or future results. The risks described below are not the only risks facing our company. Risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition and/or operating results.

Risks Relating to Our Business and Strategy

We have a limited operating history and have recently experienced significant changes to our business, which may make it difficult to evaluate our current business and predict our future performance.

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Our company has been in existence since January 2002. From 2002 until 2005, our operations focused on organizing and staffing our company and developing our technology platform. In 2005, we recognized our first revenues from product sales. Since 2005, we have continued to generate revenues, but because our revenue growth has occurred in recent periods, our limited operating history may make it difficult to evaluate our current business and predict our future performance. Additionally, since 2006, a major portion of our business revolved around our research and development collaboration with Shell with respect to advanced biofuels, and the collaboration accounted for 62%, 51% and 51%, of our revenues in 2010, 2011 and 2012 respectively. The Shell collaboration ended in August 2012 and we undertook a significant restructuring of our operations as a result and refocused our business on the pharmaceuticals market. As a result of these changes in our business, and any changes to our business focus that we may make as we move forward, our operating history in past periods may not provide much of a basis to evaluate our current business or predict our future performance. Any assessments of our current business and 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 or if we had not experienced significant changes to our business. We have encountered and will continue to encounter risks and difficulties frequently experienced by young companies in rapidly changing industries. If we do not address these risks successfully, our business will be harmed.

Our quarterly or annual operating results may fluctuate in the future. As a result, we may fail to meet or exceed the expectations of research analysts or investors, which could cause our stock price to decline.

Our financial condition and operating results have varied significantly in the past and may continue to fluctuate from quarter to quarter and year to year in the future due to a variety of factors, many of which are beyond our control. Factors relating to our business that may contribute to these fluctuations include the following factors, as well as other factors described elsewhere in this report:

- our ability to achieve or maintain profitability;
- our ability to secure third-party funding, or other strategic options, for our CodeXyme® cellulase enzymes and CodeXol®detergent alcohols programs;
- our ability to obtain substantial additional capital that may be necessary to expand our business;
- our ability to maintain internal control over financial reporting;
- charges to earnings as a result of any impairment of goodwill, intangible assets or other long-lived assets;
- our ability to realize the expected benefits from the reduction in force we undertook at the end of August 2012;
- our dependence on a limited number of customers;
- our customers' ability to timely pay amounts owed to us;
- our dependence on a limited number of products in our pharmaceutical business;
- our reliance on one contract manufacturer for commercial scale production of substantially all of our enzymes;
- our ability to develop and successfully commercialize new products for the pharmaceuticals market;
- our relationships with, and dependence on, collaborators in our principal markets;
- our ability to deploy our technology platform in new adjacent market spaces;
- our dependence on, and the need to attract and retain key management and other personnel;
- any adverse effects our recent restructuring plan may have on our ability to react to business developments and manage our business;
- the success of our customers' pharmaceutical products in the market and the ability of such customers to obtain regulatory approvals for products and processes;
- our ability to control and to improve pharmaceutical product gross margins;
- the ability of Arch to effectively market pharmaceutical products manufactured using our enzymes;
- our ability to maintain license rights for commercial scale expression systems for cellulases;

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- the feasibility of commercializing biofuels and bio-based chemicals derived from cellulose;
- fluctuations in the price of and demand for commodities that our enzymes and fermentation organisms can be employed to produce or for substitute commodities;
- the availability, cost and location of cellulosic biomass sources;
- changes to existing biofuel regulations and policies;
- our potential bio-based chemical products might not be approved or accepted by our customers;
- our ability to independently develop, manufacture, market, sell and distribute commercial cellulase enzymes;
- risks associated with the international aspects of our business;
- our ability to integrate any businesses we may acquire with our business;
- our ability to accurately report our financial results in a timely manner;
- our ability to obtain, protect and enforce our intellectual property rights;
- our ability to prevent the theft or misappropriation of our biocatalysts, the genes that code for our biocatalysts, know-how or technologies;
- potential advantages that our competitors and potential competitors may have in securing funding or developing products;
- business interruptions, such as earthquakes and other natural disasters;
- public concerns about the ethical, legal and social ramifications of genetically engineered products and processes;
- our ability to comply with laws and regulations;
- our ability to properly handle and dispose of hazardous materials used in our business;
- our ability to obtain and maintain governmental awards;
- potential product liability claims;
- the existence of government subsidies or regulation with respect to carbon dioxide emissions; and
- our ability to use our net operating loss carryforwards to offset future taxable income.

Due to the various factors mentioned above, and others, the results of any prior quarterly or annual periods should not be relied upon as indications of our future operating performance.

We have a history of net losses, such losses may increase due to the termination of our research and collaboration with Shell, and we may not achieve or maintain profitability.

We have incurred net losses since our inception, including losses of $8.5 million, $16.6 million, and $30.9 million in 2010, 2011 and 2012, respectively. As of December 31, 2012, we had an accumulated deficit of $215.6 million. To date, we have derived a substantial portion of our revenues from research and development agreements with our collaborators, particularly Shell, who accounted for 62%, 51%, and 51% of our revenues in 2010, 2011, and 2012, respectively. Our research and development collaboration with Shell terminated effective as of August 31, 2012, and we do not expect to receive further collaboration revenue from Shell. If we are unable to enter into binding collaboration agreements with new partners for our advanced biofuels program, we will have to suspend continued development of our CodeXyme® cellulase enzymes, our revenues will decline substantially and our net losses may increase. In addition, some of our collaboration agreements provide for milestone payments and future royalty payments, which we will only receive if we and our collaborators develop and commercialize products. We also may fund development of additional pharmaceutical and potential bioindustrial products, including CodeXol® detergent alcohols. There can be no assurance that any of these products will become commercially viable or that we will ever achieve profitability on a quarterly or annual basis. If we fail to achieve profitability, or if the time required to achieve profitability is longer than we anticipate, we may not be able to continue our business. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis.

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Our CodeXyme® cellulase enzymes and our CodeXol® detergent alcohols programs are heavily dependent on our ability to secure third-party funding, or to identify and effect other strategic options with respect to those programs.
Our current business plans for CodeXyme® cellulase enzymes and CodeXol® detergent alcohols are heavily dependent on third-party funding. We previously received significant funding for our advanced biofuels program from Shell under a collaborative research agreement. This agreement terminated effective as of August 31, 2012. We are in early stage discussions with multiple parties about potential collaborations, but we cannot assure you that any of our discussions will lead to collaborations or that any new collaboration will fully substitute for the termination of the Shell collaboration. Raizen and Shell currently hold rights to use our cellulase enzyme technology in Brazil, which could complicate our efforts to secure funding from third parties for our CodeXyme® cellulase program. We currently do not expect to receive development funding from Raízen to support our CodeXyme® cellulase enzyme program. To date, we have self-funded all development work for our CodeXol® detergent alcohols program. We are seeking collaboration partners to assist us with funding the development and commercialization of CodeXol® detergent alcohols. We are also exploring other strategic options with respect to both programs. If we are unable to agree to terms with new collaborators that provide us with the financial assistance and infrastructure necessary for us to develop and commercialize our products and execute our strategy with respect to CodeXyme® cellulase enzymes and CodeXol® detergent alcohols, or if we are unable to identify and effect attractive strategic options for those programs, we may need to fund this development ourselves, which will have a material adverse effect on our financial condition, or we may need to suspend the programs which may have a material adverse effect on our business and prospects.
We may need substantial additional capital in the future in order to expand our business.
Our future capital requirements may be substantial, particularly as we continue to develop our business, including investing in our CodeXyme® cellulase enzymes and CodeXol® detergent alcohol business opportunities. Although we believe that, based on our current level of operations, our existing cash, cash equivalents and marketable securities will provide adequate funds for ongoing operations, planned capital expenditures and working capital requirements for at least the next 12 months, we may need additional capital if our current plans and assumptions change. Our need for additional capital will depend on many factors, including the financial success of our pharmaceutical business, identifying business partners to fund our cellulase program and our CodeXol® detergent alcohol program, or identifying other strategic options with respect to such programs, our spending to develop and commercialize new and existing products, the effect of any acquisitions of other businesses, technologies or facilities that we may make or develop in the future, our spending on new market opportunities, including bio-based chemicals, and the filing, prosecution, enforcement and defense of patent claims. If our capital resources are insufficient to meet our capital requirements, and we are unable to enter into or maintain collaborations with partners that are able or willing to fund our development efforts or commercialize any products that we develop or enable, we will have to raise additional funds to continue the development of our technology and products and complete the commercialization of products, if any, resulting from our technologies. If future financings involve the issuance of equity securities, our existing stockholders would suffer dilution. If we raise debt financing, we may be subject to restrictive covenants that limit our ability to conduct our business. We may not be able to raise sufficient additional funds on terms that are favorable to us, if at all. If we fail to raise sufficient funds and fail to generate sufficient revenues to achieve planned gross margins and to control operating costs, our ability to fund our operations, take advantage of strategic opportunities, develop products or technologies, or otherwise respond to competitive pressures could be significantly limited. If this happens, we may be forced to delay or terminate research or development programs or the commercialization of products resulting from our technologies, curtail or cease operations or obtain funds through collaborative and licensing arrangements that may require us to relinquish commercial rights, or grant licenses on terms that are not favorable to us. If adequate funds are not available, we will not be able to successfully execute our business plan or continue our business.
We have determined that we had a material weakness in internal control over financial reporting as of December 31, 2012, which could, if not remediated, adversely impact the reliability of our financial reports, cause us to submit our financial reports in an untimely fashion, result in material misstatements in our financial statements and cause current and potential stockholders to lose confidence in our financial reporting, which in turn could adversely affect the trading price of our common stock.

Section 404 of the Sarbanes-Oxley Act of 2002 requires companies to conduct a comprehensive evaluation of their disclosure controls and procedures over financial reporting. At the end of each fiscal year, we must perform an evaluation of our disclosure controls and procedures over financial reporting, include in our annual report the results of the evaluation, and have our external auditors publicly attest to such evaluation.

In connection with the integrated audit of our consolidated financial statements and internal control over financial reporting and management's assessment of our internal controls over financial reporting at December 31, 2012, a material weakness in our internal control over financial reporting was identified. The material weakness we identified relates to the lack of a sufficient number of qualified personnel to timely and appropriately account for complex, non-routine transactions in accordance with

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United States generally accepted accounting principles. Examples of these significant non-routine transactions include, but are not limited to, complicated revenue recognition transactions and complex contractual arrangements. As a result of the restructuring activities following the termination of the Shell collaboration in August 2012, we experienced significant turnover in our finance and accounting management. Notwithstanding the use of contract personnel and external consultants, our inability to attract, train, manage and retain qualified finance and accounting personnel negatively impacted our ability to appropriately address complex, non-routine transactions.

A material weakness is defined as a deficiency, or combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of annual or interim consolidated financial statements will not be prevented or detected on a timely basis. As a result of the material weakness described above, we have concluded our internal control over financial reporting was not effective at December 31, 2012 based on the guidelines established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

We have not yet been able to remediate this material weakness. We do not know the specific timeframe needed to remediate all of the control deficiencies underlying this material weakness. In addition, we may need to incur incremental costs associated with this remediation, primarily due to the hiring of finance and accounting personnel, and the implementation and validation of improved accounting and financial reporting procedures. If we are not successful in remediating the material weakness, or if we determine in future fiscal periods that we have additional material weaknesses in our internal control over financial reporting, the reliability of our financial reports may be adversely impacted, we may be unable to submit our reports in a timely fashion and we could be required to restate our financial results. This could cause current and potential stockholders to lose confidence in our financial reporting, which could adversely affect the trading price of our common stock.

If goodwill or our intangible or other long-lived assets become impaired we may be required to record a significant charge to earnings.

Our total assets reflect substantial goodwill, intangible assets and other long-lived assets. Under accounting principles generally accepted in the United States, or GAAP, we review goodwill for impairment on at least an annual basis and at any interim date whenever events or changes in circumstances indicate that the carrying value may not be recoverable. We review our long lived and intangible assets with finite lives for impairment whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable. Events or changes in circumstances (i.e., information that indicates an impairment might exist), could include: a significant decrease in the market price of the Company's common stock; current period cash flow losses or operating losses combined with a history of losses or a forecast of continuing losses associated with the use of the assets; slower growth rates in our industry; significant adverse changes in the business climate or legal factors; accumulation of costs significantly in excess of the amount originally expected for the acquisition or construction of the assets; loss of significant customers or partners; or the current expectation that the assets will more likely than not be sold or disposed of significantly before the end of their estimated useful life. We may be required to record a significant charge to earnings in our financial statements during the period in which any impairment of our goodwill, intangible assets or other long-lived assets is determined, resulting in an adverse impact on our financial position and results of operations.

We implemented cost saving measures in the third and fourth quarters of 2012 and may implement additional cost saving measures in the future. These measures may interfere with the operation of our business and if we are unable to realize the anticipated benefits of these measures, our operating results and financial condition could be adversely affected.

In the third and fourth quarters of 2012, we implemented a reduction in our global workforce and implemented other cost savings measures to reduce our cash expenditures. These measures included the termination of approximately 55% of our global workforce and the closing of our Singapore facility. We are also in the process of vacating one of our facilities in Redwood City, California and attempting to sublease it. If we are unable to realize the expected operational efficiencies and financial benefits from this workforce reduction, or if we are unable to sublease the vacated facility, our operating results and financial condition would be adversely affected. Restructuring costs include expenses related to severance for terminated employees and other exit-related costs arising from contractual and other obligations. We continue to review our cost structure and may implement further cost saving initiatives in the future.

These cost reduction efforts may interfere with our ability to achieve our business objectives, may be difficult to manage, may cause concerns from current and potential customers, suppliers and other third parties with whom we do business and may increase the likelihood of turnover of other key employees, all of which may have an adverse impact on our business.

We are dependent on a limited number of customers.

Our current revenues are derived from a limited number of key customers. For the year ended December 31, 2011, our top five customers accounted for 77% of our total revenues, with Shell accounting for 51% of our total revenues. For the year ended December 31, 2012, our top five customers accounted for 81% of our total revenues, with Shell accounting for 51% of our total

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revenues. Our research collaboration with Shell terminated effective as of August 31, 2012, which means that we will not receive any additional collaboration funding from Shell. We expect a limited number of customers to continue to account for a significant portion of our revenues for the foreseeable future. This customer concentration increases the risk of quarterly fluctuations in our revenues and operating results. The loss of business from Shell will, and the loss or reduction from one or a combination of our other significant customers could, materially adversely affect our revenues, financial condition and results of operations.

Our revenues, financial condition and results of operations may also be adversely affected if one or more of our customers is delayed in paying, or becomes unable to pay, for our delivered products on a timely basis.

Certain of our customers are, or in the future may become, subject to significant economic and other challenges that affect their cash flow, and many customers outside of the United States are generally accustomed to vendor financing in the form of extended payment terms which may exceed contractual payment terms. To remain competitive in markets outside of the United States, we may offer selected customers such payment flexibility. We consider arrangements with extended payment terms not to be fixed or determinable, and accordingly, we defer revenue until payment is received. The costs associated with such revenue deferral are also deferred and classified as other current assets in the financial statements. If these customers fail to pay us on a timely basis it may cause our financial results to fluctuate and we may decide to grant concessions to such customers to increase the probability of payment. Such concessions, or failure by such customers to pay at all, would adversely impact our financial condition and results of operations.

We are dependent on a limited number of products in our pharmaceutical business.

Our current product revenues are derived from a limited number of pharmaceutical products. For the year ended December 31, 2012, we derived 78% of our product revenue from two pharmaceutical product families: statins and hepatitis C therapies. We expect a limited number of pharmaceutical products to continue to account for a significant portion of our pharmaceutical product revenues for the foreseeable future. This product concentration increases the risk of quarterly fluctuations in our revenues and operating results. The loss or reduction of business of one or a combination of our significant pharmaceutical products could materially adversely affect our revenues, financial condition and results of operations.

We are dependent on contract manufacturers for commercial scale production of substantially all of our enzymes.

We have limited internal capacity to manufacture enzymes. As a result, we are dependent upon the performance and capacity of third party manufacturers for the commercial scale manufacturing of the enzymes used in our pharmaceutical and cellulase businesses.

We rely on one contract manufacturer, Lactosan, for our pharmaceutical business to manufacture substantially all of the commercial enzymes used in our pharmaceutical business. Our pharmaceutical business, therefore, faces risks of difficulties with, and interruptions in, performance by Lactosan, the occurrence of which could adversely impact the availability, launch and/or sales of our enzymes in the future. We have qualified other contract manufacturers to manufacture enzymes for our pharmaceutical business, but currently have limited reliance on them for our supply requirements. The failure of any contract manufacturers that we may use to supply manufactured enzymes on a timely basis or at all, or to manufacture our enzymes in compliance with our specifications or applicable quality requirements or in volumes sufficient to meet demand would adversely affect our ability to sell pharmaceutical products, could harm our relationships with our collaborators or customers and could negatively affect our revenues and operating results. We may be forced to secure alternative sources of supply, which may be unavailable on commercially acceptable terms, cause delays in our ability to deliver products to our customers, increase our costs and decrease our profit margins.

We do not have any supply agreements in place with any enzyme contract manufacturers, other than Lactosan. In the absence of a supply agreement, a contract manufacturer will be under no obligation to manufacture our enzymes and could elect to discontinue their manufacture at any time. If we require additional manufacturing capacity and are unable to obtain it in sufficient quantity, we may not be able to increase our pharmaceutical sales, or we may be required to make substantial capital investments to build that capacity or to contract with other manufacturers on terms that may be less favorable than the terms we currently have with our suppliers. If we choose to build our own

additional manufacturing facility, it could take two years or longer before our facility is able to produce commercial volumes of our enzymes. Any resources we expend on acquiring or building internal manufacturing capabilities could be at the expense of other potentially more profitable opportunities. In addition, if we contract with other manufacturers, we may experience delays of several months in qualifying them, which could harm our relationships with our collaborators or customers and could negatively affect our revenues or operating results.

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We also expect to use contract manufacturers to produce our cellulase enzymes and any products we may manufacture for the fine chemical markets. These businesses will encounter similar risks in engaging contract manufacturers as our pharmaceutical business in the event we elect to use contract manufacturers.

If we are unable to develop and commercialize new products for the pharmaceutical market, our business and prospects will be harmed.

We plan to launch new products for the pharmaceutical market. These efforts are subject to numerous risks, including the following:

- pharmaceutical companies may be reluctant to adopt new manufacturing processes that use our enzymes;
- we may be unable to successfully develop the enzymes or manufacturing processes for our products in a timely and cost-effective manner, if at all;
- we may face difficulties in transferring the developed technologies to our customers and the contract manufacturers that we may use for commercial scale production of intermediates and enzymes;
- the contract manufacturers that we may use may be unable to scale their manufacturing operations to meet the demand for these products and we may be unable to secure additional manufacturing capacity;
- customers may not be willing to purchase these products for the pharmaceutical market from us on favorable terms, if at all;
- we may face product liability litigation, unexpected safety or efficacy concerns and pharmaceutical product recalls or withdrawals;
- changes in laws or regulations relating to the pharmaceutical industry could cause us to incur increased costs of compliance or otherwise harm our business;
- our customers' pharmaceutical products may experience adverse events or face competition from new products, which would reduce demand for our products;
- we may face pressure from existing or new competitive products; and
- we may face pricing pressures from existing or new competitors, some of which may benefit from government subsidies or other incentives.

We are dependent on our collaborators, and our failure to successfully manage these relationships could prevent us from developing and commercializing many of our products and achieving or sustaining profitability.

Our ability to maintain and manage collaborations in our markets is fundamental to the success of our business. We currently have license agreements, research and development agreements, supply agreements and/or distribution agreements with various collaborators. We may have limited or no control over the amount or timing of resources that any collaborator is able or willing to devote to our partnered products or collaborative efforts. Any of our collaborators may fail to perform its obligations. These collaborators may breach or terminate their agreements with us or otherwise fail to conduct their collaborative activities successfully and in a timely manner. Further, our collaborators may not develop products arising out of our collaborative arrangements or devote sufficient resources to the development, manufacture, marketing, or sale of these products. Moreover, disagreements with a collaborator could develop and any conflict with a collaborator could reduce our ability to enter into future collaboration agreements and negatively impact our relationships with one or more existing collaborators. If any of these events occur, or if we fail to maintain our agreements with our collaborators, we may not be able to commercialize our existing and potential products, grow our business, or generate sufficient revenues to support our operations. Our collaboration opportunities could be harmed if:

- we do not achieve our research and development objectives under our collaboration agreements in a timely manner or at all;
- we develop products and processes or enter into additional collaborations that conflict with the business objectives of our other collaborators;
- we disagree with our collaborators as to rights to intellectual property that are developed during the collaboration, or their research programs or commercialization activities;

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- we are unable to manage multiple simultaneous collaborations;
- our collaborators become competitors of ours or enter into agreements with our competitors;
- our collaborators become unable or less willing to expend their resources on research and development or commercialization efforts due to general market conditions, their financial condition or other circumstances beyond our control; or
- our collaborators experience business difficulties, which could eliminate or impair their ability to effectively perform under our agreements.

Additionally, despite the termination of the research term of our three-way research collaboration with Shell and Iogen, many elements of our collaborative research and license agreement with Shell and Iogen will continue. For example, the collaborative research and license agreement provides for certain rights, licenses and obligations of each party with respect to intellectual property and program materials that will continue after the research activities have ended. Disagreements or conflicts between and among the parties could develop even though the research program has ended. These disagreements or conflicts could result in expensive arbitration or litigation, which may not be resolved in our favor.

Finally, our business could be negatively affected if any of our collaborators or suppliers undergo a change of control or were to otherwise assign the rights or obligations under any of our agreements.

Our efforts to deploy our technology platform in adjacent market spaces, such as fine chemicals and therapeutic enzymes, may fail.

We are exploring whether to use our CodeEvolver® directed evolution technology platform to develop new products in several new adjacent market spaces, including fine chemicals and therapeutic enzymes. We do not know if we can successfully compete in these new market opportunities. Each of these new markets is well established and consists of numerous large, well-funded entrenched market participants who have long and established track records and customer relationships. If we develop new products to introduce into one or more of these new markets, we may not succeed in displacing current products. If we succeed in commercializing these new products, we may not generate significant revenue and cashflows from these activities. The failure to successfully deploy products in these new market spaces may limit our growth and have a material adverse effect on our financial condition, operating results and business prospects.

If we lose key personnel, including key management personnel, or are unable to attract and retain additional personnel as needed in the future, it could disrupt the operation of our business, delay our product development programs, harm our research and development efforts, and we may be unable to pursue collaborations or develop our own products.

Our business involves complex, global operations across a variety of markets and requires a management team and employee workforce that is knowledgeable in the many areas in which we operate. The loss of any key members of our management team or the failure to attract or retain other key employees who possess the requisite expertise for the conduct of our business could prevent us from developing and commercializing our products for our target markets and entering into collaborations or licensing arrangements to execute on our business strategy.

In addition, the loss of any key scientific staff, or the failure to attract or retain other key scientific employees, could prevent us from developing and commercializing our products for our target markets and entering into collaborations or licensing arrangements to execute on our business strategy. We may not be able to attract or retain qualified employees in the future due to the intense competition for qualified personnel among biotechnology and other technology-based businesses, particularly in the areas of biofuels and bio-based chemicals, or due to the availability of personnel with the qualifications or experience necessary for our business. Additionally, potential future government awards may require us to maintain a minimum level of staffing. If we are not able to attract and retain the necessary personnel to accomplish our business objectives, we may experience staffing constraints that will adversely affect our ability to meet the demands of our collaborators and customers in a timely fashion or to support our internal research and development programs. In particular, our product and process development programs are dependent on our ability to attract and retain highly skilled scientists and engineers. Competition for experienced scientists and other technical personnel from numerous companies and academic and other research institutions may limit our ability to do so on acceptable terms. All of our employees are at-will employees, which means that either the employee or we may terminate their employment at any time.

Our planned activities will require additional expertise in specific industries and areas applicable to the products and processes developed through our technology platform or acquired through strategic or other transactions, especially in the end markets that we seek to penetrate. These activities will require the addition of new personnel, and the development of additional

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expertise by existing personnel. The inability to attract personnel with appropriate skills or to develop the necessary expertise could impair our ability to grow our business.

In August and September 2012, we implemented a corporate restructuring plan that included a reduction in work force of approximately 55% of our total workforce and the closure of one of our overseas offices. The restructuring and reductions in workforce have had and may continue to have a negative effect on employee morale, and we may have difficulty in attracting and retaining qualified personnel.

Our business could be adversely affected if our customers' pharmaceutical products are not received well in the market, if their pharmaceutical products, or the processes used by our customers to manufacture their final pharmaceutical products, fail to be approved, or if our customers discontinue their drug development activities for any reason.

Our enzymes are used in the manufacture of intermediates and APIs which are then used in the manufacture of final pharmaceutical products by our existing and potential branded drug customers. Our business could be adversely affected if these final pharmaceutical products do not perform in the market as well as expected, or if our customers encounter competition from new entrants into the market with competing, and possibly superior, pharmaceutical products. Additionally, these pharmaceutical products must be approved by the FDA in the United States and similar regulatory bodies in other markets prior to commercialization. If our customers who sell branded-drugs, which we refer to as innovators, fail to receive regulatory approval for the drugs, fail to receive regulatory approval for new manufacturing processes for previously approved drugs, or decide for business or other reasons to discontinue their drug development activities, our revenues and prospects will be negatively impacted. The process of producing these drugs, and their generic equivalents, is also subject to regulation by the FDA in the United States and equivalent regulatory bodies in other markets. If any pharmaceutical process that uses our enzymes does not receive approval by the appropriate regulatory body or if customers decide not to pursue approval, our business could be adversely affected.

Our pharmaceutical product gross margins are variable and may decline from quarter to quarter.

Our pharmaceutical product gross margins have varied significantly in the past and may continue to fluctuate from quarter to quarter and year to year in the future due to a variety of factors, including product mix, pricing pressure from our pharmaceutical customers and competition from other products or technologies. This variability may have a material adverse impact on our operating results and financial condition and cause our stock price to decline.

Our generic pharmaceutical business is partially dependent on Arch's ability to effectively market and sell certain pharmaceutical products.

Under the New Arch Enzyme Supply Agreement, we sell enzymes to Arch that it uses to manufacture APIs and intermediates that it sells to pharmaceutical companies worldwide. A portion of our pharmaceuticals product revenues are dependent on Arch's ability to market and sell APIs and intermediates that are made by Arch using our enzymes. We cannot control Arch's level of activity or expenditures relating to the marketing of such pharmaceutical products relative to the rest of their products or marketing efforts. Arch may fail to effectively market these pharmaceutical products. Conflicting priorities, competing demands or other factors that we cannot control, and of which we may not be aware, may cause Arch to deemphasize such pharmaceutical products. If Arch does not successfully promote these pharmaceutical products in the marketplace, this could have an adverse impact on our pharmaceutical business and our revenues and operating results.

If we are unable to maintain license rights to a commercial scale expression system for enzymes that convert cellulosic biomass to sugars, our business may be materially adversely affected.

We entered into a license agreement with Dyadic International, Inc. and its affiliate, or Dyadic, in November 2008 to obtain access to an expression system and the enzymes that convert cellulosic biomass to sugars. Under the license agreement with Dyadic, we obtained a non-exclusive license under intellectual property rights of Dyadic relating to Dyadic's proprietary fungal expression technology for the production of enzymes and to the cellulase enzymes. We also obtained access to specified materials of Dyadic relating to such Dyadic technology. Our license is sublicenseable to Shell and to affiliates of Shell in the field of biofuels. Dyadic has the right to terminate our licenses under the license agreement if we challenge the validity of any of the patents licensed under the license agreement and for various other reasons. Our licenses and access to such materials of Dyadic under the license agreement will terminate

as a result of any termination of the license agreement other than due to Dyadic's material breach. If we are unable to maintain these rights on commercially reasonable terms or if the license agreement is terminated for any reason, we will need to buy or license this type of expression system from another party or develop this type of expression system ourselves, which may be difficult, costly and time consuming, in part because of the broad, existing intellectual property rights owned by Novozymes and E.I. Du Pont De Nemours and Company, or DuPont, and others. If any of these events occur, our business may be materially adversely affected.

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Commercialization of biofuels and bio-based chemicals derived from cellulose may not be feasible.

We are developing CodeXyme® cellulase enzymes for use in producing advanced biofuels and bio-based chemicals. However, production and commercialization of cellulosic biofuels and bio-based chemicals may not be feasible for a variety of reasons. For example, the development of technology for converting sugar derived from cellulosic biomass into a commercially viable biofuel or bio-based chemical is still unproven, and we do not know whether this can be done commercially and profitably. We believe that there are very few commercial scale cellulosic biofuel and cellulosic bio-based chemicals production plants in operation. There can be no assurance that anyone will be able or willing to successfully develop and operate these production plants at commercial scale or that any of these facilities can be profitable. Additionally, if existing tax credits, subsidies and other incentives in the United States and foreign markets are phased out or reduced, the overall cost of commercialization of cellulosic biofuels will increase.

Fluctuations in the price of and demand for certain commodities may reduce demand for the commercial products that use our technology, thus reducing demand for our technology.

Biofuels and some bio-based chemicals are anticipated to be marketed as an alternative to fossil fuel-based products. Therefore, if the price of natural gas or oil falls, any revenues that we generate from biofuel or bio-based chemical products could decline, and we may be unable to produce products that are a commercially viable alternative to fossil fuel-based products. For instance, implementation of and advances in hydraulic fracturing technology for the production of natural gas from shale has increased the availability of, and decreased the price of, natural gas in recent years. Additionally, demand for liquid transportation fuels, including biofuels, may decrease due to economic conditions or otherwise. Demand for bio-based chemicals may also decrease if the price of natural gas or oil decreases. Similarly, CodeXyme® cellulase enzymes are used in producing fermentable sugars, which are anticipated to be marketed as an alternative to fermentable sugars from sugar and starch food sources, such as corn and sugar cane. Therefore, if the price of sugar falls, the demand for CodeXyme® cellulase enzymes, may fall, and we may be unable to produce cellulase enzymes for use in producing fermentable sugars that are a commercially viable alternative to fermentable sugars from sugar and starch food sources.

Our biofuel and bio-based chemical business opportunities may be limited by the availability, cost or location of feedstocks.

Our business opportunities in the biofuel and bio-based chemical markets may be dependent on the availability and price of feedstocks, including sugar, starch and cellulosic biomass. If the availability of these feedstocks decreases or their price increases, this may reduce the desirability of our biofuel and bio-based chemical products and have a material adverse effect on our financial condition and operating results. At certain levels, prices may make these products uneconomical to use and produce.

The price and availability of feedstocks may be influenced by general economic, market and regulatory factors. These factors include the availability of arable land to supply feedstock, weather conditions, farming decisions, logistics for collection and storage of cellulosic biomass, government policies and subsidies with respect to agriculture and international trade, and global demand and supply. The significance and relative impact of these factors on the price of feedstocks is difficult to predict, especially without knowing what types of feedstocks we may need to use.

Our current business plan for the biofuel and bio-based chemical markets is to leverage our primary competitive strength, which we believe is our ability to optimize the performance of CodeXyme® cellulase enzymes rapidly for varying feedstocks and process conditions. While CodeXyme® cellulase enzymes may perform well on specific feedstocks and under certain process conditions, it might not perform well on other feedstocks or process conditions. If CodeXyme® cellulase enzymes do not perform as planned on our customers' feedstocks, our business may be adversely affected.

Changes to existing biofuel regulations and policies may present technical, regulatory and economic barriers, all of which may significantly reduce demand for biofuels.

The market for biofuels is heavily influenced by foreign, federal, state and local government regulations and policies concerning the petroleum industry. In 2007, the United States Congress passed an alternative fuels mandate that currently calls for approximately 36 billion gallons of liquid transportation fuels sold in 2022 to come from alternative sources, including biofuels. Of this amount, a minimum of 21 billion gallons must be advanced biofuels, with 16 billion gallons of that to be cellulosic derived. In the United States and a number of other countries, these regulations

and policies have been modified in the past and may be modified again in the future. For example, the United States Environmental Protection Agency has the authority to adjust or reduce the gallon milestones of the alternative fuels mandate to reflect the marketplace supply availability. Any reduction in mandated requirements for fuel alternatives and additives to gasoline may cause demand for biofuels to decline and deter investment in the research and development of biofuels. Congressional and market uncertainty regarding future policies will affect our ability to develop new biofuels products or to license our technologies to third parties. Any inability to address these requirements and any regulatory or policy changes could have a material adverse effect on our

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biofuels business, financial condition and operating results. Our other potential bioindustrial products may be subject to additional regulations. Adoption of E15 (15% ethanol blend) in the United States may also be a significant factor in commercialization of cellulosic ethanol. The United States Environmental Protection Agency granted final approval for the sale of E15 on June 15, 2012. However, federal, state and local governments have yet to determine their role in providing infrastructure support to aid retailers in installing, or replacing, fuel pumps that are required for E15. Installation of such pumps is an option, not a requirement, and if it is not adopted in the coming years it may limit the future demand for both corn-based and cellulosic ethanol in the United States.

Our potential bio-based chemical products may not be approved or accepted by customers.

We have only recently entered the market for bio-based chemical products used by large consumer products or chemical companies through our collaboration with Chemtex, a subsidiary of Gruppo Mossi & Ghisolfi. In entering this market, we intend to sell CodeXol® detergent alcohols as an alternative to chemicals currently in use, and in some cases the chemicals that we seek to replace have been used for many years. The potential customers for our bio-based chemical products generally have well developed manufacturing processes and arrangements with suppliers of the chemical components of their products and may resist changing these processes and components. These potential customers frequently impose lengthy and complex product qualification procedures on their suppliers. Factors that these potential customers consider during the product qualification process include consumer preference, manufacturing considerations such as process changes and capital and other costs associated with transitioning to alternative components, supplier operating history, regulatory issues, product liability and other factors, many of which are unknown to, or not well understood by, us. Satisfying these processes may take many months or years. If we are unable to convince these potential customers that our products are comparable to the chemicals that they currently use or that the use of our products produces benefits to them, we will not be successful in these markets and our business will be adversely affected. Additionally, in contrast to the tax incentives relating to biofuels, tax credits and subsidies are not currently available in the United States for consumer products or chemical companies who use our bio-based chemical products.

We face risks associated with our international business.

Significant portions of our operations are conducted outside of the United States and we expect to continue to have significant foreign operations in the foreseeable future. International business operations are subject to a variety of risks, including:

- changes in or interpretations of foreign regulations that may adversely affect our ability to sell our products, repatriate profits to the United States or operate our foreign-located facilities;
- the imposition of tariffs;
- the imposition of limitations on, or increase of, withholding and other taxes on remittances and other payments by foreign subsidiaries or joint ventures;
- the imposition of limitations on genetically-engineered products or processes and the production or sale of those products or processes in foreign countries;
- currency exchange rate fluctuations;
- uncertainties relating to foreign laws, regulations and legal proceedings including tax, import/export, anti-corruption and exchange control laws;
- the availability of government subsidies or other incentives that benefit competitors in their local markets that are not available to us;
- increased demands on our limited resources created by our diversified, global operations may require us to expand the capabilities of our administrative and operational resources and to attract, train, manage and retain qualified management, technicians, scientists and other personnel which we may be unable to do effectively;
- economic or political instability in foreign countries;
- difficulties associated with staffing and managing foreign operations; and
- the need to comply with a variety of United States and foreign laws applicable to the conduct of international business, including import and export control laws and anti-corruption laws.

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In 2011, we began doing business in Brazil and we will likely need to secure licenses, permits or other governmental approvals in order to use our technology there. The failure to obtain any applicable licenses, permits or other governmental approvals could delay or prevent the deployment of our technology in Brazil.

If we engage in any acquisitions, we will incur a variety of costs and may potentially face numerous risks that could adversely affect our business and operations.

We have made acquisitions in the past, and if appropriate opportunities become available, we expect to acquire additional businesses, assets, technologies, or products to enhance our business in the future. For example, in October 2010, we acquired substantially all of the patents and other intellectual property rights associated with Maxygen's directed evolution technology. In connection with any future acquisitions, we could:

- issue additional equity securities, which would dilute our current stockholders;
- incur substantial debt to fund the acquisitions;
- use our cash to fund the acquisitions; or
- assume significant liabilities including litigation risk.

Acquisitions involve numerous risks, including problems integrating the purchased operations, technologies or products, unanticipated costs and other liabilities, diversion of management's attention from our core businesses, adverse effects on existing business relationships with current and/or prospective collaborators, customers and/or suppliers, risks associated with entering markets in which we have no or limited prior experience and potential loss of key employees. We do not have extensive experience in managing the integration process and we may not be able to successfully integrate any businesses, assets, products, technologies, or personnel that we might acquire in the future without a significant expenditure of operating, financial and management resources, if at all. The integration process could divert management's time from focusing on operating our business, result in a decline in employee morale and cause retention issues to arise from changes in compensation, reporting relationships, future prospects or the direction of the business. Acquisitions may also require us to record goodwill and non-amortizable intangible assets that will be subject to impairment testing on a regular basis and potential periodic impairment charges, incur amortization expenses related to certain intangible assets, and incur large and immediate write offs and restructuring and other related expenses, all of which could harm our operating results and financial condition. In addition, we may acquire companies that have insufficient internal financial controls, which could impair our ability to integrate the acquired company and adversely impact our financial reporting. If we fail in our integration efforts with respect to any of our acquisitions and are unable to efficiently operate as a combined organization, our business and financial condition may be adversely affected.

We must rely on our suppliers, contract manufacturers and customers to deliver timely and accurate information in order to accurately report our financial results in the time frame and manner required by law.

We need to receive timely, accurate and complete information from a number of third parties in order to accurately report our financial results on a timely basis. We rely on suppliers and certain contract manufacturers to provide us with timely and accurate information regarding our inventories and manufacturing cost information, and we rely on current and former collaborators to provide us with product sales and cost saving information in connection with royalties owed to us. Any failure to receive timely information from one or more of these third parties could require that we estimate a greater portion of our revenues and other operating performance metrics for the period, which could cause our reported financial results to be incorrect. Moreover, if the information that we receive is not accurate, our financial statements may be materially incorrect and may require restatement, and we may not receive the full amount of revenues that we are entitled to under these arrangements. Although we typically have audit rights with these parties, performing such an audit could be harmful to our collaborative relationships, expensive and time consuming and may not be sufficient to reveal any discrepancies in a timeframe consistent with our reporting requirements.

Our ability to compete may decline if we do not adequately protect our proprietary technologies or if we lose some of our intellectual property rights.

Our success depends in part on our ability to obtain patents and maintain adequate protection of our intellectual property for our technologies and products and potential products in the United States and other countries. We have adopted a strategy of seeking patent protection in the United States and in foreign countries with respect to certain of the technologies used in or relating to our products and processes. As such, as of December 31, 2012, we owned or

controlled approximately 314 issued patents and approximately 338 pending patent applications in the United States and in various foreign jurisdictions. Some of our gene shuffling patents will expire as early as 2014. We also have license rights to a number of issued patents and pending

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patent applications in the United States and in various foreign jurisdictions. Our owned and licensed patents and patent applications are directed to our enabling technologies and to the methods and products that support our business in the pharmaceuticals manufacturing, biofuels and bio-based chemicals markets. We intend to continue to apply for patents relating to our technologies, methods and products as we deem appropriate.

Numerous patents in our portfolio involve complex legal and factual questions and, therefore, enforceability cannot be predicted with any certainty. Issued patents and patents issuing from pending applications may be challenged, invalidated, or circumvented. Moreover, the United States Leahy-Smith America Invents Act, enacted in September 2011, brings significant changes to the United States patent system, which include a change to a “first to file” system from a “first to invent” system and changes to the procedures for challenging issued patents and disputing patent applications during the examination process, among other things. The effects of these changes on our patent portfolio and business have yet to be determined, as the final substantive provisions of the America Invents Act took effect on March 16, 2013, the United States Patent and Trademark Office only recently finalized the rules relating to these changes and the courts have yet to address the new provisions. These changes could increase the costs and uncertainties surrounding the prosecution of our patent applications and the enforcement or defense of our patent rights. Additional uncertainty may result from legal precedent handed down by the United States Federal Circuit Court and Supreme Court as they determine legal issues concerning the scope and construction of patent claims and inconsistent interpretation of patent laws by the lower courts. Accordingly, we cannot ensure that any of our pending patent applications will result in issued patents, or even if issued, predict the breadth of the claims upheld in our and other companies' patents. Given that the degree of future protection for our proprietary rights is uncertain, we cannot ensure that: (i) we were the first to invent the inventions covered by each of our pending applications, (ii) we were the first to file patent applications for these inventions, or (iii) the proprietary technologies we develop will be patentable.

In addition, unauthorized parties may attempt to copy or otherwise obtain and use our products or technology. Monitoring unauthorized use of our intellectual property is difficult, and we cannot be certain that the steps we have taken will prevent unauthorized use of our technology, particularly in certain foreign countries where the local laws may not protect our proprietary rights as fully as in the United States. Moreover, third parties could practice our inventions in territories where we do not have patent protection. Such third parties may then try to import products made using our inventions into the United States or other territories. If competitors are able to use our technology, our ability to compete effectively could be harmed. Moreover, others may independently develop and obtain patents for technologies that are similar to or superior to our technologies. If that happens, we may need to license these technologies, and we may not be able to obtain licenses on reasonable terms, if at all, which could cause harm to our business.

Third parties may claim that we are infringing their intellectual property rights or other proprietary rights, which may subject us to costly and time consuming litigation and prevent us from developing or commercializing our products. Our commercial success also depends in part on our ability to operate without infringing patents and proprietary rights of third parties, and without breaching any licenses or other agreements that we have entered into with regard to our technologies, products and business. We cannot ensure that patents have not been issued to third parties that could block our ability to obtain patents or to operate as we would like. There may be patents in some countries that, if valid, may block our ability to make, use or sell our products in those countries, or import our products into those countries, if we are unsuccessful in circumventing or acquiring the rights to these patents. There also may be claims in patent applications filed in some countries that, if granted and valid, may also block our ability to commercialize products or processes in these countries if we are unable to circumvent or license them.

The industries in which we operate, and the biotechnology industry in particular, are characterized by frequent and extensive litigation regarding patents and other intellectual property rights. Many biotechnology companies have employed intellectual property litigation as a way to gain a competitive advantage. Our involvement in litigation, interferences, opposition proceedings or other intellectual property proceedings inside and outside of the United States, to defend our intellectual property rights or as a result of alleged infringement of the rights of others, may divert our management's time from focusing on business operations and could cause us to spend significant amounts of money. Any potential intellectual property litigation also could force us to do one or more of the following:

- stop selling or using our products or technologies that use the subject intellectual property;

- pay monetary damages or substantial royalties;
- grant cross-licenses to third parties relating to our patents or proprietary rights;
- obtain from the third party asserting its intellectual property rights a license to sell or use the relevant technology, which license may not be available on reasonable terms, or at all; or

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- redesign those products or processes that use any allegedly infringing technology, or relocate the operations relating to the allegedly infringing technology to another jurisdiction, which may result in significant cost or delay to us, could be technically infeasible or could prevent us from selling some of our products in the United States or other jurisdictions.

We are aware of a significant number of patents and patent applications relating to aspects of our technologies filed by, and issued to, third parties. We cannot assure you that if this third party intellectual property is asserted against us that we would ultimately prevail.

If any of our competitors have filed patent applications or obtained patents that claim inventions also claimed by us, we may have to participate in interference proceedings before the United States Patent and Trademark Office to determine priority of invention and, thus, the right to the patents for these inventions in the United States. These proceedings could result in substantial cost to us even if the outcome is favorable. Even if successful, any interference may result in loss of certain claims. Any litigation or proceedings could divert our management's time and efforts. Even unsuccessful claims could result in significant legal fees and other expenses, diversion of management time, and disruption in our business. Uncertainties resulting from initiation and continuation of any patent or related litigation could harm our ability to compete.

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

The laws of some foreign countries, including Brazil, where we have recently begun to do business, do not protect intellectual property rights to the same extent as the laws of the United States. Many companies have encountered significant problems in protecting and defending intellectual property rights in certain foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property, particularly those relating to biotechnology and/or bioindustrial technologies. Accordingly, our efforts to protect our intellectual property rights in such countries may be inadequate. This could make it difficult for us to stop the infringement of our patents or misappropriation of our other intellectual property rights. Additionally, proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business.

If our biocatalysts, or the genes that code for our biocatalysts, are stolen, misappropriated or reverse engineered, others could use these biocatalysts or genes to produce competing products.

Third parties, including our contract manufacturers, customers and those involved in shipping our biocatalysts, often have custody or control of our biocatalysts. If our biocatalysts, or the genes that code for our biocatalysts, were stolen, misappropriated or reverse engineered, they could be used by other parties who may be able to reproduce these biocatalysts for their own commercial gain. If this were to occur, it would be difficult for us to challenge this type of use, especially in countries with limited intellectual property protection or in countries in which we do not have patents covering the misappropriated biocatalysts.

Confidentiality agreements with employees and others may not adequately prevent disclosures of trade secrets and other proprietary information.

We rely in part on trade secret protection to protect our confidential and proprietary information and processes. However, trade secrets are difficult to protect. We have taken measures to protect our trade secrets and proprietary information, but these measures may not be effective. We require employees and consultants to execute confidentiality agreements upon the commencement of an employment or consulting arrangement with us. These agreements generally require that all confidential information developed by the individual or made known to the individual by us during the course of the individual's relationship with us be kept confidential and not disclosed to third parties. These agreements also generally provide that inventions conceived by the individual in the course of rendering services to us shall be our exclusive property. Nevertheless, our proprietary information may be disclosed, third parties could reverse engineer our biocatalysts and others may independently develop substantially equivalent proprietary information and techniques or otherwise gain access to our trade secrets. Costly and time-consuming litigation could be necessary to enforce and determine the scope of our proprietary rights, and failure to obtain or maintain trade secret protection could adversely affect our competitive business position.

Competitors and potential competitors who have greater resources and experience than we do may develop products and technologies that make ours obsolete or may use their greater resources to gain market share at our expense.

The biocatalysis industry and each of our target markets are characterized by rapid technological change. Our future success will depend on our ability to maintain a competitive position with respect to technological advances. In addition, as we enter new markets, we will face new competition and will need to adapt to competitive factors that may be different from what we face today.

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We are aware that other companies, including Royal DSM N.V., or DSM, DuPont, Novozymes, and Vercipia Biofuels, an affiliate of BP P.L.C., have alternative methods for obtaining and generating genetic diversity or use mutagenesis techniques to produce genetic diversity. Academic institutions such as the California Institute of Technology, the Max Planck Institute and the Center for Fundamental and Applied Molecular Evolution (FAME), a jointly sponsored initiative between Emory University and Georgia Institute of Technology, are also working in this field. Technological development by others may result in our products and technologies, as well as products developed by our customers using our biocatalysts, becoming obsolete.

We face intense competition in the pharmaceuticals market. There are a number of companies who compete with us throughout the various stages of a pharmaceutical product's lifecycle. Many large pharmaceutical companies have internal capabilities to develop and manufacture intermediates and APIs. These companies include many of our large innovator and generic pharmaceutical customers, such as Merck, Pfizer and Teva Pharmaceutical Industries Ltd. There are also many large, well-established fine chemical manufacturing companies, such as DSM, BASF Corporation and Lonza Group Ltd, that compete to supply pharmaceutical intermediates and APIs to our customers. We also face increasing competition from generic pharmaceutical manufacturers and contract manufacturers in low cost centers such as India and China.

In addition to competition from companies manufacturing APIs and intermediates, we face competition from companies that sell biocatalysts for use in the pharmaceutical market. There is competition from large industrial enzyme companies, such as Novozymes and Amano Enzyme Inc., whose industrial enzymes (for detergents, for example) are occasionally used in pharmaceutical processes. There is also competition in this area from several small companies with product offerings comprised primarily of naturally occurring biocatalysts or that offer biocatalyst optimization services.

We expect to enter the market for cellulase enzymes, which are used to produce sugar for the manufacture of biofuels and bio-based chemicals. Our significant competitors in this market include Novozymes and DuPont, which have both been active in this market for many years. Novozymes has partnered with a number of companies and organizations on a regional basis to develop cellulases for the production of biofuels, including partnering with M&G in Italy to be the cellulase supplier to a commercial scale cellulosic ethanol plant being built by Chemtex, and DuPont is marketing a line of cellulases to convert cellulosic biomass into sugar. These competitors have greater resources than we do, own or otherwise control established intellectual rights portfolios, have existing relationships with customers that we hope to sell CodeXyme® cellulase enzymes to, have long-term supply agreements already in place with customers for their bio-based products, and have the supply chain in place to sell their cellulases on a global platform. Our ability to compete in this market may be limited by our relatively late start. Additionally, DSM has announced that it expects to participate in this market.

There are also other companies developing competing cellulosic ethanol technologies. Significant competitors include companies such as: Novozymes, which is opening a biofuel demonstration plant with Inbicon A/S of Denmark; DuPont is marketing a line of cellulases to convert cellulosic biomass into sugar; DSM, which acquired C5 Yeast Company B.V. in 2011 enhancing DSM's position in the cellulosic biofuel sector, and which has recently partnered with POET LLC to form POET-DSM Advanced Biofuels to construct a facility to produce cellulosic ethanol; Mascoma Corporation, which entered into a definitive agreement with Valero Energy Corporation in December 2011 to build a commercial-scale cellulosic ethanol biorefinery; BP, which is developing a commercial scale cellulosic ethanol facility through its affiliate Vercipia Biofuels; and Coskata, Inc., which is developing a hybrid thermochemical-biocatalytic process to produce ethanol from a variety of feedstocks.

We entered the bio-based chemical market in 2011 with our CodeXol® detergent alcohols. Our significant competitors in this market include companies that have been active in this marketplace for many years, namely Sasol, Shell, BASF, Kao Corporation and Liaoning Huaxing. These companies have greater resources in this market than we do and have long-term supply arrangements already in place with consumer products companies. We also face competition from smaller companies that are developing biological routes to detergent alcohols, such as LS9, Inc. Our ability to compete in this market may be limited by our relatively late start.

Our ability to compete successfully in any of these markets will depend on our ability to develop proprietary products that reach the market in a timely manner and are technologically superior to and/or are less expensive than other

products on the market. Many of our competitors have substantially greater production, financial, research and development, personnel and marketing resources than we do. They also started developing products earlier than we did, which may allow them to establish blocking intellectual property positions or bring products to market before we can. In addition, certain of our competitors may also benefit from local government subsidies and other incentives that are not available to us. As a result, our competitors may be able to develop competing and/or superior technologies and processes, and compete more aggressively and sustain that competition over a longer period of time than we could. Our technologies and products may be rendered obsolete or uneconomical by technological advances or entirely different approaches developed by one or more of our competitors. We cannot be certain that any products we develop in the future will compare favorably to products offered by our competitors or that our existing or future products will compare favorably to any new products that are developed by our competitors. As more

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companies develop new intellectual property in our markets, the possibility of a competitor acquiring patent or other rights that may limit our products or potential products increases, which could lead to litigation.

In addition, various governments have recently announced a number of spending programs focused on the development of clean technology, including alternatives to petroleum-based fuels. Such spending programs could lead to increased funding for our competitors or the rapid increase in the number of competitors within those markets.

Our limited resources relative to many of our competitors may cause us to fail to anticipate or respond adequately to new developments and other competitive pressures. This failure could reduce our competitiveness and market share, adversely affect our results of operations and financial position, and prevent us from obtaining or maintaining profitability.

Business interruptions could delay us in the process of developing our products and could disrupt our sales.

Our headquarters is located in the San Francisco Bay Area near known earthquake fault zones and is vulnerable to significant damage from earthquakes. We are also vulnerable to other types of natural disasters and other events that could disrupt our operations, such as riot, civil disturbances, war, terrorist acts, flood, infections in our laboratory or production facilities or those of our contract manufacturers and other events beyond our control. We do not have a detailed disaster recovery plan. In addition, we do not carry insurance for earthquakes and we may not carry sufficient business interruption insurance to compensate us for losses that may occur. Any losses or damages we incur could have a material adverse effect on our cash flows and success as an overall business.

Ethical, legal and social concerns about genetically engineered products and processes could limit or prevent the use of our products, processes, and technologies and limit our revenues.

Some of our products and processes are genetically engineered or involve the use of genetically engineered products or genetic engineering technologies. If we and/or our collaborators are not able to overcome the ethical, legal, and social concerns relating to genetic engineering, our products and processes may not be accepted. Any of the risks discussed below could result in increased expenses, delays, or other impediments to our programs or the public acceptance and commercialization of products and processes dependent on our technologies or inventions. Our ability to develop and commercialize one or more of our technologies, products, or processes could be limited by the following factors:

- public attitudes about the safety and environmental hazards of, and ethical concerns over, genetic research and genetically engineered products and processes, which could influence public acceptance of our technologies, products and processes;
- public attitudes regarding, and potential changes to laws governing ownership of genetic material, which could harm our intellectual property rights with respect to our genetic material and discourage collaborators from supporting, developing, or commercializing our products, processes and technologies; and
- governmental reaction to negative publicity concerning genetically modified organisms, which could result in greater government regulation of genetic research and derivative products. The subject of genetically modified organisms has received negative publicity, which has aroused public debate. This adverse publicity could lead to greater regulation and trade restrictions on imports of genetically altered products. The biocatalysts that we develop have significantly enhanced characteristics compared to those found in naturally occurring enzymes or microbes. While we produce our biocatalysts only for use in a controlled industrial environment, the release of such biocatalysts into uncontrolled environments could have unintended consequences. Any adverse effect resulting from such a release could have a material adverse effect on our business and financial condition, and we may have exposure to liability for any resulting harm.

Compliance with stringent laws and regulations may be time consuming and costly, which could adversely affect the commercialization of our bioindustrial products.

Our bioindustrial products, including those used in the biofuels and bio-based chemicals markets, will need to meet a significant number of regulations and standards, including regulations imposed by the United States Department of Transportation, the United States Environmental Protection Agency, various state agencies and others. In addition, our bioindustrial products will be subject to foreign regulations if we attempt to produce or sell our products outside the United States. For example, we expect that our products and technologies will be subject to import and export controls when they are shipped internationally. Any failure to comply or delays in compliance, with the various existing and

evolving industry regulations and standards could prevent or delay the commercialization of any bioindustrial products developed using our technologies and subject us to fines and other penalties.

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We use hazardous materials in our business and we must comply with environmental laws and regulations. Any claims relating to improper handling, storage or disposal of these materials or noncompliance of applicable laws and regulations could be time consuming and costly and could adversely affect our business and results of operations.
Our research and development and commercial processes involve the use of hazardous materials, including chemical, radioactive, and biological materials. Our operations also produce hazardous waste. We cannot eliminate entirely the risk of accidental contamination or discharge and any resultant injury from these materials. Federal, state, local and foreign laws and regulations govern the use, manufacture, storage, handling and disposal of, and human exposure to, these materials. We may be sued for any injury or contamination that results from our use or the use by third parties of these materials, and our liability may exceed our total assets. Although we believe that our activities comply in all material respects with environmental laws, there can be no assurance that violations of environmental, health and safety laws will not occur in the future as a result of human error, accident, equipment failure or other causes.
Compliance with applicable environmental laws and regulations may be expensive, and the failure to comply with past, present, or future laws could result in the imposition of fines, third party property damage, product liability and personal injury claims, investigation and remediation costs, the suspension of production, or a cessation of operations, and our liability may exceed our total assets. Liability under environmental laws can be joint and several and without regard to comparative fault. Environmental laws could become more stringent over time imposing greater compliance costs and increasing risks and penalties associated with violations, which could impair our research, development or production efforts and harm our business. In addition, we may have to indemnify some of our customers or suppliers for losses related to our failure to comply with environmental laws, which could expose us to significant liabilities.
We face compliance risks associated with our government awards.
We are subject to routine audits by government agencies or other third parties as part of our government awards. The government auditor may review our performance, cost structures and compliance with applicable laws, regulations and standards. Funds available under government financial assistance must be applied by us toward the research and development programs specified by the funding agencies, rather than for all of our programs generally. If any of our costs are found to be allocated improperly, the costs may not be reimbursed and any costs already reimbursed may have to be refunded. Accordingly, an audit could result in an adjustment to our revenues and results of operations.
We may be sued for product liability.
The design, development, manufacture and sale of our products involve an inherent risk of product liability claims and the associated adverse publicity. For example, we may be named directly in product liability suits relating to drugs that are produced using our enzymes or that incorporate our intermediates and APIs. The biocatalysts, pharmaceutical intermediates and APIs that we produce or are produced for us by our manufacturing partners could be subject to quality control or contamination issues of which we are not aware. Claims could be brought by various parties, including customers who are purchasing products directly from us, other companies who purchase products from our customers or by the end users of the drugs. We could also be named as co-parties in product liability suits that are brought against our contract manufacturers who manufacture our enzymes, pharmaceutical intermediates and APIs, such as Lactosan and/or Arch. Insurance coverage is expensive and may be difficult to obtain, and may not be available in the future on acceptable terms, or at all. We cannot assure you that any contract manufacturer that we have used in the past or shall use in the future has or will have adequate insurance coverage to cover against potential claims. In addition, although we currently maintain product liability insurance for our products in amounts we believe to be commercially reasonable, if the coverage limits of these insurance policies are not adequate, a claim brought against us, whether covered by insurance or not, could have a material adverse effect on our business, results of operations, financial condition and cash flows. This insurance may not provide adequate coverage against potential losses, and if claims or losses exceed our liability insurance coverage, we may go out of business. Moreover, we have agreed to indemnify some of our customers for certain claims that may arise out of the use of our products, which could expose us to significant liabilities.
Our ability to use our net operating loss carryforwards to offset future taxable income may be subject to certain limitations.
In general, under Section 382 of the Internal Revenue Code, a corporation that undergoes an “ownership change” is subject to limitations on its ability to utilize its pre-change net operating loss carryforwards, or NOLs, to offset future

taxable income. If the Internal Revenue Service challenges our analysis that our existing NOLs are not subject to limitations arising from previous ownership changes, our ability to utilize NOLs could be limited by Section 382 of the Internal Revenue Code. Future changes in our stock ownership, some of which are outside of our control, could result in an ownership change under Section 382 of the Internal Revenue Code. Furthermore, our ability to utilize NOLs of companies that we may acquire in the future may be subject to limitations. For these reasons, we may not be able to utilize a material portion of the NOLs reflected in our financial statements, even if we attain profitability.

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Risks Related to Owning our Common Stock

We are subject to anti-takeover provisions in our certificate of incorporation and bylaws and under Delaware law, as well as our stockholder rights plan, that could delay or prevent an acquisition of our company, even if the acquisition would be beneficial to our stockholders.

Provisions in our amended and restated certificate of incorporation and our bylaws may delay or prevent an acquisition of us. Among other things, our amended and restated certificate of incorporation and bylaws provide for a board of directors which is divided into three classes, with staggered three-year terms and provide that all stockholder action must be effected at a duly called meeting of the stockholders and not by a consent in writing, and further provide that only our board of directors, the chairman of the board of directors, our chief executive officer or president may call a special meeting of the stockholders. In addition, our amended and restated certificate of incorporation allows our board of directors, without further action by our stockholders, to issue up to 5,000,000 shares of preferred stock in one or more series and to fix the rights, preferences, privileges and restrictions thereof. These provisions may also 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, who are responsible for appointing the members of our management team. Furthermore, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which prohibits, with some exceptions, stockholders owning in excess of 15% of our outstanding voting stock from merging or combining with us. Finally, our charter documents establish advanced notice requirements for nominations for election to our board of directors and for proposing matters that can be acted upon at stockholder meetings. Although we believe these provisions together provide for an opportunity to receive higher bids by requiring potential acquirers to negotiate with our board of directors, they would apply even if an offer to acquire our company may be considered beneficial by some stockholders.

On September 3, 2012, we entered into a stockholder rights plan and declared a dividend of one preferred stock purchase right for each share of our common stock held by stockholders of record as of September 18, 2012. Each right entitles stockholders, after the rights become exercisable, to purchase one one-thousandth of a share of our Series A Preferred Stock, par value $0.0001, at a purchase price of $11.35 per one-thousandth of a share of Series A Preferred Stock. In general, the rights become exercisable at the close of business on the tenth business day following (i) public announcement that a person or group acquired 15% or more of our common stock or (ii) commencement or announcement of a tender offer for 15% or more of our common stock. The rights may discourage a third-party from making an unsolicited proposal to acquire us, as exercise of the rights would cause substantial dilution to a person or group that attempts to acquire us on terms not approved by our board of directors. The rights should not interfere with any merger or other business combination approved by our board of directors since the rights may be redeemed by us at $0.0001 per right at any time before any person or group acquires 15% or more of our outstanding common stock. These rights expire in September 2013.

Concentration of ownership among our existing officers, directors and principal stockholders may prevent other stockholders from influencing significant corporate decisions and depress our stock price.

Based on the number of shares outstanding as of December 31, 2012, our officers, directors and stockholders who hold at least 5% of our stock together beneficially own approximately 31% of our outstanding common stock. If these officers, directors, and principal stockholders or a group of our principal stockholders act together, they will be able to exert a significant degree of influence over our management and affairs and control matters requiring stockholder approval, including the election of directors and approval of mergers or other business combination transactions. The interests of this concentration of ownership may not always coincide with our interests or the interests of other stockholders. For instance, officers, directors, and principal stockholders, acting together, could cause us to enter into transactions or agreements that we would not otherwise consider. Similarly, this concentration of ownership may have the effect of delaying or preventing a change in control of our company otherwise favored by our other stockholders. As of December 31, 2012, Raízen, Biomedical Sciences Investment Fund Pte Ltd. and CMEA Ventures beneficially owned approximately 14.8%, 8.4% and 8.0% of our common stock, respectively.

Our share price may be volatile which may cause the value of our common stock to decline and subject us to securities class action litigation.

The market price of shares of our common stock could be subject to wide fluctuations in response to many risk factors listed in this section, and others beyond our control, including:

- actual or anticipated fluctuations in our financial condition and operating results;
- the position of our cash, cash equivalents and marketable securities;
- actual or anticipated changes in our growth rate relative to our competitors;

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- actual or anticipated fluctuations in our competitors' operating results or changes in their growth rate;
- announcements of technological innovations by us, our collaborators or our competitors;
- announcements by us, our collaborators or our competitors of significant acquisitions or dispositions, strategic partnerships, joint ventures or capital commitments;
- announcements or developments regarding technical progress of CodeXyme® cellulase enzymes or CodeXol® detergent alcohols;
- additions or losses of one or more significant pharmaceutical products;
- announcements or developments regarding pharmaceutical products manufactured using our biocatalysts, intermediates and APIs;
- the entry into, modification or termination of collaborative arrangements;
- additions or losses of customers;
- additions or departures of key management or scientific personnel;
- competition from existing products or new products that may emerge;
- issuance of new or updated research reports by securities or industry analysts;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- disputes or other developments related to proprietary rights, including patent litigation and our ability to obtain patent protection for our technologies;
- changes in existing laws, regulations and policies applicable to our business and products, including the National Renewable Fuel Standard program;
- contractual disputes or litigation with our partners, customers or suppliers;
- announcement or expectation of additional financing efforts;
- sales of our common stock by us, our insiders or our other stockholders;
- share price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- general market conditions in our industry; and
- general economic and market conditions, including the recent financial crisis.

Furthermore, the stock markets have experienced extreme price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. These fluctuations often have been unrelated or disproportionate to the operating performance of those companies. These broad market and industry fluctuations, as well as general economic, political and market conditions such as recessions, interest rate changes or international currency fluctuations, may negatively impact the market price of shares of our common stock. In the past, companies that have experienced volatility in the market price of their stock have been subject to securities class action litigation. We may be the target of this type of litigation in the future. Securities litigation against us could result in substantial costs and divert our management's attention from other business concerns, which could seriously harm our business.

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

The trading market for our common stock will be influenced by the research and reports that securities or industry analysts publish about us or our business. We do not have any control over these analysts. If one or more of the analysts who cover us downgrade our stock or change their opinion of our stock in a negative manner, our stock price would likely decline. If one or more of these analysts cease coverage of our company or fail to regularly publish reports on us, we could lose visibility in the financial markets, which could cause our stock price or trading volume to decline.

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We incur significant costs as a result of operating as a public company, and our management is required to devote substantial time to compliance initiatives.

As a public company, we incur significant legal, accounting and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act and the Dodd-Frank Wall Street Reform and Consumer Protection Act, as well as related rules implemented by the Securities and Exchange Commission and The NASDAQ Stock Market, impose various requirements on public companies that require our management and other personnel to devote a substantial amount of time to compliance initiatives.

In addition, the Sarbanes-Oxley Act requires, among other things, that we maintain effective internal control over financial reporting and disclosure controls and procedures. In particular, we must perform system and process evaluation and testing of our internal control over financial reporting to allow management and our independent registered public accounting firm to report on the effectiveness of our internal control over financial reporting, as required by Section 404 of the Sarbanes-Oxley Act. Our compliance with Section 404 requires that we incur substantial accounting expense and expend significant management time on compliance-related issues. Moreover, if we are not able to maintain compliance with the requirements of Section 404, our stock price could decline, and we could face sanctions, delisting or investigations by The NASDAQ Global Market, or other material adverse effects on our business, reputation, results of operations, financial condition or liquidity.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Not applicable.

ITEM 2. PROPERTIES

Facilities

Our headquarters are located in Redwood City, California, where we lease approximately 107,000 square feet of office and laboratory space. On March 16, 2011, we entered into a Fifth Amendment to Lease (the “Fifth Amendment”) with Metropolitan Life Insurance Company (“MetLife”) with respect to our offices located at 200 and 220 Penobscot Drive, Redwood City, California, (the “Penobscot Space”), 400 Penobscot Drive, Redwood City, California (the “Building 2 Space”) and 640 Galveston Drive, Redwood City, California (the “Galveston Space”), and with respect to approximately 29,921 square feet of additional space located at 101 Saginaw Drive, Redwood City, California (the “Saginaw Space”). Under the Fifth Amendment, the term of the lease of the Penobscot Space, the Building 2 Space and the Saginaw Space lasts until January 31, 2020, and we have options to extend for two additional five year periods. Pursuant to the Fifth Amendment, we surrendered the Galveston Space in August 2011. Due to restructuring activities undertaken during the second half of 2012, we are in the process of vacating our Saginaw Space and marketing it for sublease.

We also lease space in the 501 Chesapeake Drive, Redwood City, California (the “501 Chesapeake Space”). In September 2012, we entered into a Sixth Amendment to Lease (the “Sixth Amendment”) with MetLife with respect to the 501 Chesapeake Space to extend the term of the lease of the 501 Chesapeake Space to January 31, 2017. Pursuant to the Sixth Amendment, we have two consecutive options to extend the term of the lease for the 501 Chesapeake Space for an additional period of five years per option.

We believe that the facilities that we currently lease in California are adequate for our needs for the immediate future and that, should it be needed, additional space can be leased to accommodate any future growth.

In Hungary, we occupy approximately 1,700 square meters (equivalent to approximately 18,000 square feet) of office and laboratory space. The term of the lease expires in September 2016. We have an option to extend the lease for an additional term of five years. We believe that the facilities that we currently lease in Hungary are adequate for our needs for the immediate future and that, should it be needed, additional space can be leased to accommodate any future growth.

In Singapore, we lease approximately 1,900 square meters (equivalent to approximately 20,000 square feet) of office and laboratory space within Singapore Science Park II. The term of the lease expires in July 2013.

As part of a restructuring plan in the third quarter of 2012, the Company committed to close its Singapore facility, which was substantially completed in October 2012.

ITEM 3. LEGAL PROCEEDINGS

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

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ITEM 4. MINE SAFETY DISCLOSURES
Not applicable.

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PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information

Our common stock is quoted on The NASDAQ Global Select Market, or NASDAQ, under the symbol "CDXS." The following table sets forth the high and low sales prices per share of the common stock as reported on NASDAQ. Such quotations represent inter dealer prices without retail markup, markdown or commission and may not necessarily represent actual transactions.

Fiscal 2012	High	Low
First Quarter	$6.12	$3.45
Second Quarter	4.55	2.96
Third Quarter	4.00	2.01
Fourth Quarter	3.20	2.00
Fiscal 2011	High	Low
First Quarter	$11.99	$9.00
Second Quarter	12.24	8.54
Third Quarter	10.25	4.20
Fourth Quarter	6.26	3.91

As of March 22, 2013, there were approximately 187 shareholders of record. A substantially greater number of stockholders may be "street name" or beneficial holders, whose shares are held of record by banks, brokers and other financial institutions.

Dividend Policy

We have never declared or paid cash dividends on our common stock, and currently do not plan to declare dividends on shares of our common stock in the foreseeable future. We expect to retain our future earnings, if any, for use in the operation and expansion of our business. The payment of cash dividends in the future, if any, will be at the discretion of our board of directors and will depend upon such factors as earnings levels, capital requirements, our overall financial condition and any other factors deemed relevant by our board of directors.

Use of Proceeds from Public Offering of Common Stock

There has been no material change in the planned use of proceeds from our IPO as described in our final prospectus filed with the SEC on April 22, 2010 pursuant to Rule 424(b). We invested the funds received in registered money market funds and other marketable securities.

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Stock Price Performance Graph

The following graph compares our total common stock return with the total return for (i) the NASDAQ Composite Index and (ii) the NASDAQ Biotechnology Index for the period April 22, 2010 through December 31, 2012. The figures represented below assume an investment of $100 in our common stock at the closing price on April 22, 2010 and in the NASDAQ Composite Index and the NASDAQ Biotechnology Index on April 22, 2010 and the reinvestment of dividends into shares of common stock. The comparisons in the table are required by the SEC and are not intended to forecast or be indicative of possible future performance of our common stock. This graph shall not be deemed "soliciting material" or to be "filed" for purposes of Section 18 of the Exchange Act or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any of our filings under the Securities Act or the Exchange Act.

$100 investment in stock or index	Ticker	4/22/2010	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10
Codexis	CDXS	100.00	102.71	77.98	66.06	67.50	61.16	72.40	77.22	71.04	79.94
Nasdaq Composite Index	IXIC	100.00	97.70	89.60	83.73	89.51	83.92	94.03	99.54	99.17	105.31
Nasdaq Biotechnology Index	NBI	100.00	101.30	90.19	86.13	90.01	87.44	96.40	99.88	97.72	103.81

$100 investment in stock or index	Ticker	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11
Codexis	CDXS	68.10	80.39	89.14	79.11	82.58	72.62	67.87	48.94	34.46	34.77	36.35	39.97
Nasdaq Composite Index	IXIC	104.89	105.90	112.07	120.29	122.24	119.34	116.35	107.69	104.40	109.89	114.47	116.79
Nasdaq Biotechnology Index	NBI	107.19	110.45	110.40	114.07	112.55	110.10	109.42	102.40	95.88	106.56	104.02	103.42

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$100 investment in stock or index	Ticker	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
Codexis	CDXS	42.01	29.71	27.53	27.30	23.53	27.98	23.23	17.12	22.85	19.61	16.14	16.67
Nasdaq Composite Index	IXIC	111.70	117.78	122.73	120.93	112.24	116.51	116.69	121.75	123.71	118.19	119.50	119.87
Nasdaq Biotechnology Index	NBI	129.90	133.20	137.94	140.19	137.88	145.53	149.82	152.62	160.02	148.10	155.71	154.06

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ITEM 6. SELECTED FINANCIAL DATA

The following selected consolidated financial data should be read together with our consolidated financial statements and accompanying notes and "Management's Discussion and Analysis of Financial Condition and Results of Operations" appearing elsewhere in this Annual Report on Form 10-K. The selected consolidated financial data in this section is not intended to replace our consolidated financial statements and the accompanying notes. Our historical results are not necessarily indicative of our future results.

We derived the consolidated statements of operations data for the fiscal years ended December 31, 2012, 2011, and 2010 and the consolidated balance sheets data as of December 31, 2012 and 2011 from our audited consolidated financial statements appearing elsewhere in this filing. The consolidated statements of operations data for the fiscal years ended December 31, 2009 and 2008 and the consolidated balance sheets data as of December 31, 2010, 2009 and 2008 have been derived from our audited consolidated financial statements not included in this filing. The data should be read in conjunction with the consolidated financial statements, related notes, and other financial information included herein.

SELECTED CONSOLIDATED FINANCIAL DATA

	Years Ended December 31,				
	2012	2011	2010	2009	2008
	(In Thousands, Except Per Share Amounts)				
Consolidated Statements of Operations Data:					
Revenues:					
Product	$35,924	$49,021	$32,835	$18,554	$16,860
Collaborative research and development	50,127	71,368	70,196	64,308	33,301
Government awards	2,247	3,476	4,073	46	317
Total revenues	88,298	123,865	107,104	82,908	50,478
Costs and operating expenses:					
Cost of product revenues	30,647	41,781	27,982	16,678	13,188
Research and development	56,785	61,049	52,405	54,725	45,554
Selling, general and administrative	31,379	36,942	33,841	29,871	35,709
Total costs and operating expenses	118,811	139,772	114,228	101,274	94,451
Loss from operations	(30,513)	(15,907)	(7,124)	(18,366)	(43,973)
Interest income	252	273	166	180	1,538
Interest expense and other, net	(326)	(675)	(1,199)	(2,037)	(2,365)
Loss before provision (benefit) for income taxes	(30,587)	(16,309)	(8,157)	(20,223)	(44,800)
Provision (benefit) for income taxes	270	241	384	66	327
Net loss	$(30,857)	$(16,550)	$(8,541)	$(20,289)	$(45,127)
Net loss attributable to common stockholders per share of common stock, basic and diluted	(0.84)	(0.46)	(0.35)	(7.74)	(18.96)
Weighted average common shares used in computing net loss per share of common stock, basic and diluted	36,768	35,674	24,594	2,622	2,380

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	December 31,				
	2012	2011	2010	2009	2008
	(In Thousands)				
Consolidated Balance Sheets Data:					
Cash, cash equivalents and marketable securities, current	$45,527	$53,482	$72,396	$55,563	$37,130
Working capital	43,486	50,940	64,708	16,397	5,933
Total assets	99,965	135,922	141,300	99,036	70,882
Current and long-term financing obligations	—	—	—	7,942	13,681
Redeemable convertible preferred stock	—	—	—	179,672	132,746
Total stockholders' equity (deficit)	78,440	$102,690	$107,361	$(144,845)	$(129,124)

`ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis should be read in conjunction with our audited consolidated financial statements and the related notes that appear elsewhere in this Annual Report on Form 10-K. This Annual Report on Form 10-K contains "forward-looking statements" within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. These statements are often identified by the use of words such as "may," "will," "expect," "believe," "anticipate," "intend," "could," "should," "estimate," or "continue," and similar expressions or variations. forward-looking statements are subject to risks, uncertainties and other factors that could cause actual results and the timing of certain events to differ materially from future results expressed or implied by such forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in the section titled "Risk Factors," set forth in Part I, Item 1A of this Annual Report on Form 10-K and elsewhere in this report. The forward-looking statements in this Annual Report on Form 10-K represent our views as of the date of this Annual Report on Form 10-K. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we have no current intention of doing so except to the extent required by applicable law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this Annual Report on Form 10-K.

Business Overview

We engineer enzymes for pharmaceutical, biofuel and chemical production. Our proven technologies enable scale-up and implementation of biocatalytic solutions to meet customer needs for rapid, cost-effective and sustainable process development, from research to manufacturing.

We have commercialized our technology and products in the pharmaceuticals market, which is our primary business focus. There are currently over 50 pharmaceutical firms using our technology, products and services in their manufacturing process development, including in the production of some of the world's bestselling and fastest growing drugs.

We are developing our CodeXyme® cellulase enzymes to convert non-food plant material, which we call cellulosic biomass, into affordable sugars, which can then be converted into renewable fuels and chemicals. We are also developing our own manufacturing process for CodeXol® detergent alcohols, which are bio-based chemicals. Detergent alcohols are used to manufacture surfactants, which are key, active cleaning ingredients in consumer products such as shampoos, liquid soaps and laundry detergents. We are seeking collaboration partners to assist us with the development and commercialization of CodeXyme® cellulase enzymes and CodeXol® detergent alcohols, and we are also exploring other strategic options with respect to these products and technologies.

We create our products by applying our CodeEvolver® directed evolution technology platform, which introduces genetic mutations into microorganisms, giving rise to changes in the enzymes that they produce. Once we identify potentially beneficial mutations, we test combinations of these mutations until we have created variant enzymes that exhibit marketable performance characteristics superior to competitive products. This process allows us to make continuous, efficient improvements to the performance of our enzymes.

Results of Operations Overview

To date, we have generated revenues primarily from collaborative research and development funding, pharmaceutical product sales and government awards. Our revenues in 2012 were $88.3 million which is down significantly compared to our 2011

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revenues of $123.9 million and our 2010 revenues of $107.1 million. The decrease in revenues is primarily due to decreases in both our collaborative research and development revenue and pharmaceutical product sales.

Most of our revenues since inception have been derived from collaborative research and development arrangements, which accounted for 57%, 58% and 66% of our revenues in 2012, 2011 and 2010, respectively.

Our collaborative research agreement with Shell terminated effective August 31, 2012 and as a result, we no longer receive collaborative research and development revenues from Shell subsequent to August 31, 2012. This will significantly decrease our revenues as compared to prior periods and in all future periods. Collaborative research and development revenues received from Shell were $45.3 million, $63.2 million and $66.1 million in 2012, 2011 and 2010, respectively, and accounted for 51%, 51% and 62% of our total revenues in 2012, 2011 and 2010, respectively.

Our product sales accounted for 41%, 40% and 31% of our revenues in 2012, 2011 and 2010, respectively. Our product sales in 2012 were $35.9 million which is down significantly compared to our 2011 product sales of $49.0 million and only a marginal increase compared to our 2010 product revenues of $32.8 million. The decrease in product sales as compared to 2011 is primarily due to the timing of generic and innovator pharmaceutical product orders and due to the New Arch Enzyme Supply Agreement, which became effective on November 1, 2012, as described below.

We have experienced significant losses as we have invested heavily in research and development and administrative infrastructure in connection with the growth in our business. We intend to continue our investment in research and development. As of December 31, 2012, we had an accumulated deficit of $215.6 million. We incurred net losses of $30.9 million, $16.6 million and $8.5 million in the years ended December 31, 2012, 2011 and 2010, respectively.

Termination of Shell Collaboration

In September 2012, we entered into the New Shell Agreement, which terminated our collaboration with Shell under the existing Shell Research Agreement and amended the existing Shell License Agreement. See “Collaborations and License Agreements-Shell” in Part I, Item 1 of this Annual Report on Form 10-K for a description of the New Shell Agreement.

The New Shell Agreement required Shell to pay us $7.5 million as full, complete and final satisfaction of amounts that Shell may have owed to us under the Shell Research Agreement with respect to (i) full-time employee equivalents, or FTEs, assigned by us to perform our obligations under the Shell Research Agreement and (ii) milestones achieved or achievable by us under the Shell Research Agreement. We recognized this $7.5 million payment as collaborative research and development revenues during the year ended December 31, 2012. Beginning September 1, 2012, we have no further obligations to Shell under the Shell Research Agreement to provide any FTEs to perform work under or after the collaboration and Shell correspondingly has no future obligations to us under the Shell Research Agreement to provide funding for FTEs to perform work under or after the collaboration.

Prior to the New Shell Agreement, Shell had an obligation under the Research Agreement to fund us at specified rates for each FTE, which as of 2012 were equal to $460,000 on an annual basis for each FTE in the United States and $399,000 on an annual basis for each FTE in Hungary. As of August 31, 2012, the number of FTEs assigned by us to perform our obligations under the Research Agreement was 116. For the year ended December 31, 2012, Shell accounted for 50% of our total revenues.

As a result of the termination of the Shell Research Agreement, we initiated a series of cost reduction measures and refocused our business on the pharmaceuticals market. We terminated approximately 173 employees worldwide, consisting of 150 research and development staff and 23 general and administrative staff. We also closed our Singapore research and development facility. We estimate that we will incur $2.4 million in restructuring expenses related to these cost reduction measures, including severance for terminated employees, and other exit-related costs arising from contractual obligations associated with closed facilities under lease and equipment disposals. During 2012, we recorded $1.1 million of leasehold improvement write down, $0.7 million of employee severance and other termination benefits, $0.3 million of facility lease termination costs and $0.3 million of equipment disposal charges. We paid $0.6 million in cash during the fourth quarter of 2012 for these restructuring expenses and expect to pay a remaining $0.4 million in the first half of 2013.

We anticipate our expected 2013 cost reductions resulting from restructuring our operation in the United States will be $22.1 million. Our total expected 2013 cost reductions resulting from closing our operations in Singapore is expected

to be $7.1 million. We anticipate that these cost reduction measures will generate annual cost savings related to employee compensation costs of $20.9 million, specifically $3.3 million in general and administrative costs and $17.6 million in research and development costs. The remaining cost reduction measure will generate annual cost savings primarily related to outside services, information technology and laboratory equipment expenses, facilities expenses, and recruiting and relocation costs.

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Despite the termination of the Shell Research Agreement, we expect to continue our advanced biofuels program, primarily focusing on developing our CodeXyme® cellulase enzymes for use in producing advanced biofuels. We are actively seeking third party funding to support our CodeXyme® cellulase enzyme program. We are in early stage discussions with multiple parties about potential collaborations, but there can be no assurances that any of our discussions will lead to collaborations or that any new collaboration will fully substitute for the termination of the Shell collaboration. We are exploring other strategic options for the program. We currently do not expect to receive development funding from Raízen, our largest shareholder, to support our CodeXyme® cellulase enzyme program. If we are unable to agree to terms with new collaborators that provide us with the financial assistance and infrastructure necessary for us to develop and commercialize our products and execute our strategy with respect to CodeXyme® cellulase enzymes, or if we are unable to identify and effect attractive strategic options for that program, we will need to continue to fund this development ourselves, which will have a material adverse effect on our liquidity and financial condition, or we may need to suspend the program, which may have a material adverse effect on our business and prospects.

Maxygen Transaction

In October 2010, we acquired Maxygen's directed evolution technology patent portfolio for net consideration of $20.2 million consisting of $20.0 million paid to Maxygen, related transaction costs of $0.7 million and a royalty payable extinguishment of $0.5 million. In conjunction with this transaction, we terminated our existing license agreement with Maxygen including terminating our obligation to pay biofuels royalties to Maxygen.

CO2 Solutions Investment

Our investment in CO_2 Solutions and the joint development agreement we signed with CO_2 Solutions in 2009 was our initial entry into carbon management. We estimated the fair value of our investment in 10,000,000 common shares of CO_2 Solutions using the market value of common shares as determined by trading on the TSX Venture Exchange. During 2012, we evaluated our investment in the common shares of CO_2 Solutions and determined the impairment was other-than-temporary considering the length of time and extent to which the fair value has been less than our cost, the financial condition and near term prospects of CO_2 Solutions, and our management's ability and intent to hold the securities until fair value recovers. As a result of our analysis, we recorded an impairment of $0.8 million during the year ended December 31, 2012 as an expense in our consolidated statement of operations as selling, general and administrative expense. As of December 31, 2012, the fair value of our investment in CO_2 Solutions' common stock was $0.6 million with an unrealized gain of $47,000.

Carbon Management Program

Our carbon management program received $1.6 million in 2012 and $2.2 million in 2011 in funding under a 2010 ARPA-E Recovery Act program award from the United States Department of Energy for development of innovative technology to remove carbon dioxide from coal-fired power plant emissions. The award supported development of biocatalysts for more efficient carbon capture from these plants. The award agreement concluded in June 2012. We also had a collaboration in carbon management with Alstom Power, Inc., or Alstom, which included funding for up to 12 FTEs. We recognized $3.8 million in revenue in 2011 from this collaboration. The Alstom collaboration concluded in October 2011. We are no longer actively developing our carbon capture technology.

Singapore Economic Development Board Grant

We also received award revenues of $0.6 million in 2012 and $1.3 million in 2011 from the Singapore Economic Development Board, or EDB, for our research and development center in Singapore. This award was terminated in December 2012 in conjunction with the closure of our Singapore research facility.

Arch Collaboration

Since 2006, Arch of Mumbai, India has manufactured substantially all of our commercialized intermediates and APIs for sale to generic and innovator manufacturers. We were party to a number of agreements with Arch that govern the commercialization of various current and future products for supply into the generic and innovator marketplaces. In November 2012, we entered into the New Arch Enzyme Supply Agreement, which terminated our existing supply agreements with Arch. Under the New Arch Enzyme Supply Agreement, Arch agreed to exclusively purchase our proprietary enzymes from us for use in the manufacture of certain of Arch's products and we agreed to exclusively supply, with limited exceptions, certain of our proprietary enzymes to Arch at an agreed upon price for use in such

manufacture. Arch will no longer produce API and intermediates for us to market and sell and Arch will no longer pay us royalties on the sale of APIs and intermediates to customers. We expect that selling our proprietary enzymes to Arch rather than selling the resulting APIs or intermediates that Arch manufactured for us will result in a decrease in our product revenues in all future periods. However, we expect that our product gross margin will be higher, which we expect to result in a product gross profit comparable with our historical product gross profit.

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Contract Manufacturers

We have limited internal manufacturing capacity at our headquarters in Redwood City, California. We expect to rely on third-party manufacturers for commercial production of our biocatalysts for the foreseeable future. Our in-house manufacturing is dedicated to producing both our Codex® Biocatalyst Panels and Kits and biocatalysts for use by our customers in pilot scale production. We also supply initial commercial quantities of biocatalysts for use by our collaborators to produce pharmaceutical intermediates and manufacture biocatalysts that we sell.

We actively seek contract manufacturers who are willing to invest in capital equipment to manufacture our products at commercial scale. As a result, we are heavily dependent on the availability of manufacturing capacity at, and the reliability of, our contract manufacturers. We also pursue collaborations with industry leaders that allow us to leverage our collaborators' engineering, manufacturing and commercial expertise, their distribution infrastructure and their ability to fund commercial scale production facilities. If our collaborators choose to utilize our technology to commercialize new products, we expect our collaborators will finance, build and operate the larger, more expensive facilities for the intermediate or end products in our markets, which will allow us to expand into new markets without having to finance or operate large industrial facilities.

We primarily rely on one contract manufacturer Lactosan, located in Austria, to manufacture substantially all of the enzymes used in our pharmaceutical business. We have qualified other contract manufacturers for the manufacture of our enzymes, but we do not currently use them for any of our supply commitments. In addition, we contract with other suppliers for the manufacture of our pharmaceutical intermediates and APIs.

Other Collaborations

Our strategy for collaborative arrangements is to retain substantial participation in the future economic value of our technology while receiving current cash payments to offset research and development costs and working capital needs. These agreements are complex and have multiple elements that cover a variety of present and future activities. In addition, certain elements of these agreements are intrinsically difficult to separate and treat as separate units for accounting purposes, especially exclusivity payments. Consequently, we expect to recognize these exclusivity payments over the term of the exclusivity period.

Revenues and Operating Expenses

Revenues

Our revenues are comprised of collaborative research and development revenues, product revenues and government awards.

- Collaborative research and development revenues include license, technology access and exclusivity fees, FTE payments, milestones, royalties, and optimization and screening fees.
- Product revenues consist of sales of biocatalysts, intermediates, APIs and Codex® Biocatalyst Panels and Kits.
- Government awards consist of payments from government entities. The terms of these awards generally provide us with cost reimbursement for certain types of expenditures in return for research and development activities over a contractually defined period. Historically, we have received government awards from Germany, Singapore and the United States.

Cost of Product Revenues

Cost of product revenues includes both internal and third-party fixed and variable costs including amortization of purchased technology, materials and supplies, labor, facilities and other overhead costs associated with our product revenues.

Research and Development Expenses

Research and development expenses consist of costs incurred for internal projects as well as partner-funded collaborative research and development activities. These costs include our direct and research-related overhead expenses, which include salaries and other personnel-related expenses (including stock-based compensation), occupancy-related costs, supplies, depreciation of facilities and laboratory equipment and amortization of acquired technologies, as well as research consultants, and are expensed as incurred. Costs to acquire technologies that are utilized in research and development and that have no alternative future use are expensed when incurred.

Our research and development efforts devoted to our product and process development projects changed from 57 projects in 2010 to 38 projects in 2011 and 40 in 2012 as we have focused our research and development resources on

fewer projects. Our internal research and development projects are typically completed in 12 to 24 months, and generally the costs associated with any single internal project during these periods were not material.

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Selling, General and Administrative Expenses

Selling, general and administrative expenses consist of compensation expenses (including stock-based compensation), hiring and training costs, consulting and service provider expenses (including patent counsel related costs), marketing costs, occupancy-related costs, depreciation and amortization expenses, and travel and relocation expenses.

Critical Accounting Policies and Estimates

Management's discussion and analysis of our financial condition and results of operations are based upon our consolidated financial statements. The consolidated financial statements have been prepared in conformity with generally accepted accounting principles in the United States and include our accounts and the accounts of our wholly-owned subsidiaries. The preparation of our consolidated financial statements requires our management to make estimates, assumptions, and judgments that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the applicable periods. Management bases its estimates, assumptions and judgments on historical experience and on various other factors that are believed to be reasonable under the circumstances. Different assumptions and judgments would change the estimates used in the preparation of our consolidated financial statements, which, in turn, could change the results from those reported. Our management evaluates its estimates, assumptions and judgments on an ongoing basis.

The critical accounting policies requiring estimates, assumptions, and judgments that we believe have the most significant impact on our consolidated financial statements are described below.

Revenue Recognition

Revenues are recognized when the four basic revenue recognition criteria are met: (1) persuasive evidence of an arrangement exists; (2) products have been delivered, transfer of technology has been completed or services have been rendered; (3) the fee is fixed or determinable; and (4) collectability is reasonably assured.

Our primary sources of revenues consist of collaborative research and development agreements, product revenues and government awards. Collaborative research and development agreements typically provide us with multiple revenue streams, including up-front fees for licensing, exclusivity and technology access, fees for full-time employee equivalent ("FTE") services and the potential to earn milestone payments upon achievement of contractual criteria and royalty fees based on future product sales or cost savings by our customers. Our collaborative research and development revenues consist of revenues from Shell, which revenues have ceased as a result of the termination of the Shell Research Agreement, and revenues from other collaborative research and development agreements.

For each source of collaborative research and development revenues, product revenues and award revenues, we apply the following revenue recognition criteria:

- Up-front fees received in connection with collaborative research and development agreements, including license fees, technology access fees, and exclusivity fees, are deferred upon receipt, are not considered a separate unit of accounting and are recognized as revenues over the relevant performance periods.

Revenues related to FTE services recognized as research services are performed over the related performance periods for each contract. We are required to perform research and development activities as specified in each respective agreement. The payments received are not refundable and are based on a contractual reimbursement rate per FTE working on the project. When up-front payments are combined with FTE services in a single unit of accounting, we recognize the up-front payments using the proportionate performance method of revenue recognition based upon the actual amount of research and development labor hours incurred relative to the amount of the total expected labor hours to be incurred by us, up to the amount of cash received. In cases where the planned levels of research services fluctuate substantially over the research term, we are required to make estimates of the total hours required to perform our obligations. Research and development expenses related to FTE services under the collaborative research and development agreements approximate the research funding over the term of the respective agreements.

- A payment that is contingent upon the achievement of a substantive milestone is recognized in its entirety in the period in which the milestone is achieved. A milestone is an event (i) that can only be achieved based in whole or in part on either our performance or on the occurrence of a specific outcome resulting from our performance, (ii) for which there is substantive uncertainty at the date the arrangement is entered into that the event will be achieved, and (iii) results in additional payments being due to us. Milestones are considered substantive when the consideration

earned from the achievement of the milestone (i) is commensurate with either our performance to

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achieve the milestone or the enhancement of value of the item delivered as a result of a specific outcome resulting from our performance, (ii) relates solely to past performance, and (iii) is reasonable relative to all deliverable and payment terms in the arrangement.

- Other payments received for which such payments are contingent solely upon the passage of time or the result of a collaborative partner's performance are recognized as revenue when earned in accordance with the contract terms and when such payments can be reasonably estimated and collectability is reasonably assured.
- We recognize revenues from royalties based on licensees' sales of products using our technologies. Royalties are recognized as earned in accordance with the contract terms when royalties from licensees can be reasonably estimated and collectability is reasonably assured.
- We generate a significant percentage of our sales in India and other emerging markets. Customers in these countries are subject to significant economic and other challenges that affect their cash flow, and many customers outside the United States are generally accustomed to vendor financing in the form of extended payment terms which may exceed contractual payment terms. To remain competitive in markets outside the United States, we may offer selected customers such payment flexibility. We consider arrangements with extended payment terms not to be fixed or determinable, and accordingly, we defer revenue until payment is received. The costs associated with such revenue deferral are also deferred and classified as other current assets in the financial statements.
- Product revenues are recognized once passage of title and risk of loss has occurred and contractually specified acceptance criteria have been met, provided all other revenue recognition criteria have also been met. Product revenues consist of sales of biocatalysts, intermediates, active pharmaceutical ingredients and Codex® Biocatalyst Panels and Kits. Cost of product revenues includes both internal and third party fixed and variable costs including amortization of purchased technology, materials and supplies, labor, facilities and other overhead costs associated with our product revenues.
- We licensed mutually agreed upon third party technology for use in our research and development collaboration with Shell. We recorded the license payments to research and development expense, offset by the related reimbursements received from Shell. These payments made by Shell to us are direct reimbursements of our costs. We accounted for these direct reimbursable costs as a net amount, whereby no expense or revenue is recorded for the costs reimbursed by Shell. For any payments not reimbursed by Shell, we recognized these as expenses in the statement of operations. We elected to present the reimbursements from Shell as a component of our research and development expense since presenting the receipt of payment from Shell as revenues does not reflect the substance of the arrangement.
- We receive payments from government entities for work performed in the form of government awards. Government awards are agreements that generally provide us with cost reimbursement for certain types of expenditures in return for research and development activities over a contractually defined period. Revenues from government awards are recognized in the period during which the related costs are incurred, provided that the conditions under which the government awards were provided have been met and we have only perfunctory obligations outstanding.
- Shipping and handling costs charged to customers are recorded as revenues. Shipping costs are included in our cost of product revenues. Such charges were not significant in any of the periods presented.

Milestone revenue

We evaluated the nature of the milestone triggering the contingent payment, and concluded that the amount can be recognized as a milestone payment based on the facts that (i) the milestone was achieved through successful performance by us, (ii) the milestone was at risk at the inception of the arrangement, (iii) the milestone was substantive in nature and is non-refundable, (iv) substantial effort was required by us to complete the milestone, (v) the amount of milestone payment is reasonable in relation to the value created in achieving the milestone, and (vi) the milestone payment relates solely to past performance. No further milestones payments are expected under this arrangement from this pharmaceutical partner.

Stock-Based Compensation

We recognize compensation expense related to share-based transactions, including the awarding of employee stock options and restricted stock units ("RSU"), based on the estimated fair value of the awards granted.

We estimate the fair value of our stock option grants using the Black-Scholes option-pricing model. We calculate the estimated volatility rate based on historical volatility of our common stock. Due to our limited history of grant

activity, we calculate the

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expected life of options granted to employees using the “simplified method” permitted by the United States Securities Exchange Commission, or SEC, as the average of the total contractual term of the option and its vesting period. The risk-free rate assumption was based on United States Treasury instruments whose terms were consistent with the terms of our stock options. The expected dividend assumption was based on our history and expectation of dividend payouts.

We account for stock options issued to non-employees based on their estimated fair value determined using the Black-Scholes option-pricing model. The fair value of the options granted to non-employees is re-measured as they vest, and the resulting increase in value, if any, is recognized as expense during the period the related services are rendered.

Impairment of Long-Lived Assets and Intangible Assets

Long-lived and intangible assets with finite lives are reviewed for impairment whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. Recoverability of these assets is measured by comparison of their carrying amounts to future undiscounted cash flows the assets are expected to generate.

The Company's intangible assets with finite lives consist of customer relationships, developed core technology, trade names, and the intellectual property (“IP”) rights associated with the acquisition of Maxygen's directed evolution technology in 2010. Intangible assets were recorded at their fair values at the date we acquired the assets and, for those assets having finite useful lives, are amortized using the straight-line method over their estimated useful lives. The Company's long-lived assets include property, plant and equipment, and other non-current assets.

We determined that we have a single entity wide asset group (“Asset Group”). The directed evolution technology patent portfolio acquired from Maxygen (“Core IP”) is the most significant component of the Asset Group since it is the base technology for all aspects of our research and development, and represents the basis for all of our identifiable cash flow generating capacity. Consequently, we do not believe that identification of independent cash flows associated with our long-lived assets is currently possible at any lower level than the Asset Group.

The Core IP is the only finite-lived intangible asset on our balance sheet as of December 31, 2012 and is considered the primary asset within the Asset Group. The remaining useful life of the Core IP extends through the fourth quarter of 2016. There has been no significant change in the utilization or estimated life of our Core IP since we acquired the technology patent portfolio from Maxygen. The estimated remaining useful life of our Core IP is not impacted by the termination of the Shell Research Agreement.

The carrying value of our long-lived assets in the Asset Group may not be recoverable based upon the existence of one or more indicators of impairment which could include: a significant decrease in the market price of the Company's common stock; current period cash flow losses or operating losses combined with a history of losses or a forecast of continuing losses associated with the use of the assets; slower growth rates in our industry; significant adverse changes in the business climate or legal factors; accumulation of costs significantly in excess of the amount originally expected for the acquisition or construction of the assets; loss of significant customers or partners; or the current expectation that the assets will more likely than not be sold or disposed of significantly before the end of their estimated useful life.

We evaluate recoverability of our long-lived assets and intangible assets based on the sum of the undiscounted cash flows expected to result from the use, and the eventual disposal of, the Asset Group. We make estimates and judgments about the future undiscounted cash flows over the remaining useful life of the Asset Group. Our anticipated future cash flows include our estimates of existing or in process product revenues, production and operating costs, future capital expenditures, working capital needs, and assumptions regarding the ultimate sale of the Asset Group at the end of the life of the primary asset. The useful life of the Asset Group was based on the remaining useful life of the Core IP, the primary asset.

As of December 31, 2012 we determined that our continued operating losses and the termination of the Shell Research Agreement were indications of impairment. Consequently, we tested our long-lived assets and intangible assets for impairment as of December 31, 2012.

As part of a comprehensive strategic planning exercise the Company undertook in the fourth quarter of 2012 and early 2013, we developed a detailed multi-year operating plan of both revenue and expense. Our best-estimate of future

cash flows used to test the recoverability of the Asset Group as of December 31, 2012 was developed directly from this plan using a forecast period consistent with the remaining useful life of the Core IP. Although our cash flow forecasts are based on assumptions that are consistent with our plans, there is significant exercise of judgment involved in determining the cash flows attributable to our Asset Group over its estimated remaining useful life. The undiscounted cash flows included revenue and expense from our core pharmaceutical business and other enzyme markets adjacent to our pharmaceutical business. These adjacent enzyme businesses, which will leverage our Core IP and

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pharmaceutical technology and processes, include business opportunities in the fine chemical and enzymatic therapeutic markets.

We typically receive revenues from our core pharmaceutical business and expect to receive revenues from other enzyme markets adjacent to our pharmaceutical business in the form of one or more of the following: up-front payments, milestone payments, payments based upon the number of full-time employee equivalents, or FTEs, engaged in related research and development activities and licensing fees and royalties. Our best estimate of future cash flows does not include any CodeXol® and CodeXyme® revenues associated with collaboration research and development agreements, but does include an estimate of cash flows from potential strategic transactions with respect to our CodeXyme® and CodeXol® programs, as described below.

Approximately 69% and 31% of total Company revenues included in our estimated undiscounted cash flows (excluding cash flows from potential strategic transactions with respect to our CodeXyme® and CodeXol® programs) over the remaining useful life of the Core IP are derived from our core pharmaceutical business and adjacent enzyme opportunities, respectively.

Our core pharmaceutical business revenues are estimated based on existing commercial relationships, signed agreements or contracts, and conservative estimates for the capture of additional market share that management determined to be reasonably achievable. For existing and in process customer revenues we assumed a modest rate of growth based on our historical business model for our core pharmaceutical business, including research and development services revenue from partners and customers, which management determined to be reasonably achievable. We have historically worked closely with our pharmaceutical partners, such as Merck, to evolve, engineer and develop enzymes that meet their specific needs. Our business model is based on having our partners and customers pay in whole or in part for the research and development required to engineer the enzymes required.

In determining which adjacent enzyme markets to exploit, management assessed various segments of the large and growing enzyme markets and selected those adjacent markets where we already had entry points through our existing pharmaceutical business relationships, such as fine chemicals and enzymatic therapeutics markets. Estimated revenues associated with these adjacent markets are based on market penetration and adoption rates that management determined to be reasonably achievable.

We calculated our expected residual value in 2016 by applying a Gordon Growth Model to our estimated 2016 normalized net cash flows using a discount rate of 18% (“Estimated Weighted-Average Cost of Capital”), long term growth rate of 2%, and a capitalization factor of 6.25. The 18% discount rate reflects the nature and the risk of the underlying forecast, and includes such financial components as the risk free rate, systemic stock price risk based on an evaluation with peer companies (“beta”), equity risk premium, size premium, and company specific risk. The long term growth rate of 2% reflects projected inflation and general economic conditions. Based on these estimates, judgments, and factors, we determined that the residual value included in the undiscounted cash flows was $72.3 million.

We also included in the undiscounted cash flows an estimate of cash flows from potential strategic transactions with respect to our existing CodeXyme® cellulase enzymes and CodeXol® detergent alcohols programs. The amount of estimated cash flows was determined by probability weighting different scenarios to derive at a weighted average of most probable outcomes, with CodeXol® and CodeXyme® representing 11% and 27%, respectively, of the total undiscounted cash flows associated with the Asset Group. These amounts are not based on any existing signed contracts or agreements.

The result of our fourth quarter 2012 impairment analysis indicates that the undiscounted cash flows for the Asset Group are greater than the carrying value of the Asset Group by approximately 14%.

Any inability to align future production costs, operating costs, capital expenditures and working capital needs with significant changes in the timing and/or level of estimated future revenue could adversely impact our projected undiscounted cash flows. Future changes in the estimated useful life of our long-lived assets could also adversely impact our projected undiscounted cash flows and result in future impairment charges. If it is determined that the Asset Group is not recoverable, an impairment loss would be calculated based on the excess of the carrying amount of the intangible and long-lived assets over the fair value. Any future impairment charges could have a material adverse effect on our financial position and results of operations.

Impairment of Goodwill

Goodwill represents the excess of the purchase price over the fair value of assets acquired and liabilities assumed. Goodwill is presumed to have an indefinite life and is not subject to amortization. Goodwill is reviewed for impairment annually and whenever events or changes in circumstances indicate that the carrying value of the goodwill may not be recoverable.

We determined that the Company has only one operating segment and reporting unit under the criteria in ASC 280, Segment Reporting, and accordingly, all of our goodwill is associated with the Company. Our review of goodwill for indicators of impairment is performed at the Company level.

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The goodwill impairment test consists of a two-step process. The first step of the goodwill impairment test, used to identify potential impairment, compares the fair value of the reporting unit to its carrying value. If the fair value of the reporting unit exceeds its carrying amount, goodwill of the reporting unit is considered not impaired, and the second step of the impairment test is not required.

We use our market capitalization as an indicator of fair value. We believe that since our reporting unit is publicly traded, the ability of a controlling shareholder to benefit from synergies and other intangible assets that arise from control might cause the fair value of our reporting unit as a whole to exceed its market capitalization. However, we believe that the fair value measurement need not be based solely on the quoted market price of an individual share of our common stock, but also can consider the impact of a control premium in measuring the fair value of our reporting unit.

Should our market capitalization be less than our total stockholder's equity as of our annual test date or as of any interim impairment testing date, we would also consider market comparables, recent trends in our stock price over a reasonable period and, if appropriate, use an income approach (discounted cash flow) to determine whether the fair value of our reporting unit is greater than our carrying amount.

If we were to use an income approach we would establish a fair value by estimating the present value of our projected future cash flows expected to be generated from our business. The discount rate applied to the projected future cash flows to arrive at the present value would be intended to reflect all risks of ownership and the associated risks of realizing the stream of projected future cash flows. Our discounted cash flow methodology would consider projections of financial performance for a period of several years combined with an estimated residual value. The most significant assumptions we would use in a discounted cash flow methodology are the discount rate, the residual value and expected future revenues, gross margins and operating costs, along with considering any implied control premium.

The second step, if required, compares the implied fair value of the reporting unit goodwill with the carrying amount of that goodwill. If the carrying amount of the reporting unit's goodwill exceeds its implied fair value, an impairment charge is recognized in an amount equal to that excess. Implied fair value is the excess of the fair value of the reporting unit over the fair value of all identified assets and liabilities.

Goodwill was tested for impairment as of October 1, 2012, the date of the Company's annual impairment review. The Company concluded that the fair value of the reporting unit exceeded the carrying value and no impairment existed. No impairment charges were recorded during the years ended December 31, 2012, 2011 and 2010.

Income Tax Provision

We use the liability method of accounting for income taxes, whereby deferred tax assets or liability account balances are calculated at the balance sheet date using current tax laws and rates in effect for the year in which the differences are expected to affect taxable income. Valuation allowances are provided when necessary to reduce deferred tax assets to the amount that will more likely than not be realized.

We make certain estimates and judgments in determining income tax expense for financial statement purposes. These estimates and judgments occur in the calculation of tax credits, benefits and deductions and in the calculation of certain tax assets and liabilities, which arise from differences in the timing of recognition of revenues and expenses for tax and financial statement purposes. Significant changes to these estimates may result in an increase or decrease to our tax provision in a subsequent period.

In assessing the realizability of deferred tax assets, we consider whether it is more likely than not that some portion or all of the deferred tax assets will be realized on a jurisdiction by jurisdiction basis. The ultimate realization of deferred tax assets is dependent upon the generation of taxable income in the future. We have recorded a deferred tax asset in jurisdictions where ultimate realization of deferred tax assets is more likely than not to occur.

We make estimates and judgments about our future taxable income that are based on assumptions that are consistent with our plans and estimates. Should the actual amounts differ from our estimates, the amount of our valuation allowance could be materially impacted. Any adjustment to the deferred tax asset valuation allowance would be recorded in the income statement for the periods in which the adjustment is determined to be required.

We account for uncertainty in income taxes as required by the provisions of ASC Topic 740, Income Taxes, which clarifies the accounting for uncertainty in income taxes recognized in an enterprise’s financial statements. The first step is to evaluate the tax position for recognition by determining if the weight of available evidence indicates that it is

more likely than not that the position will be sustained on audit, including resolution of related appeals or litigation processes, if any. The second step is to estimate and measure the tax benefit as the largest amount that is more than 50% likely of being realized upon ultimate

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settlement. It is inherently difficult and subjective to estimate such amounts, as this requires us to determine the probability of various possible outcomes. We consider many factors when evaluating and estimating our tax positions and tax benefits, which may require periodic adjustments and may not accurately anticipate actual outcomes.

The Tax Reform Act of 1986 and similar state provisions limit the use of net operating loss carryforwards in certain situations where equity transactions result in a change of ownership as defined by Internal Revenue Code Section 382. In the event we should experience an ownership change, as defined, utilization of our federal and state net operating loss carryforwards could be limited.

Results of Operations

Financial Operations Overview

The following table shows the amounts from our consolidated statements of operations for the periods presented (in thousands).

	Years Ended December 31,			% of Total Revenues		
	2012	2011	2010	2012	2011	2010
Revenues:						
Product	$35,924	$49,021	$32,835	40 %	39 %	30 %
Collaborative research and development	50,127	71,368	70,196	57 %	58 %	66 %
Government awards	2,247	3,476	4,073	3 %	3 %	4 %
Total revenues	88,298	123,865	107,104	100 %	100 %	100 %
Costs and operating expenses:						
Cost of product revenues	30,647	41,781	27,982	35 %	34 %	26 %
Research and development	56,785	61,049	52,405	64 %	49 %	49 %
Selling, general and administrative	31,379	36,942	33,841	36 %	30 %	32 %
Total costs and operating expenses	118,811	139,772	114,228	135 %	113 %	107 %
Loss from operations	(30,513)	(15,907)	(7,124)	nm	nm	nm
Interest income	252	273	166	— %	— %	— %
Interest expense and other, net	(326)	(675)	(1,199)	nm	nm	nm
Loss before provision for income taxes	(30,587)	(16,309)	(8,157)	nm	nm	nm
Provision for income taxes	270	241	384	— %	— %	— %
Net loss	$(30,857)	$(16,550)	$(8,541)	nm	nm	nm

Years Ended December 31, 2012 and 2011

Revenues

	Years Ended December 31,		Change	
(In Thousands)	2012	2011	$	%
Product	$35,924	$49,021	$(13,097)	(27)%
Collaborative research and development	50,127	71,368	(21,241)	(30)%
Government awards	2,247	3,476	(1,229)	(35)%
Total revenues	$88,298	$123,865	$(35,567)	(29)%

Revenues decreased during the year ended December 31, 2012 compared to the year ended December 31, 2011, due to decreases across all sources of revenues, including product sales, collaborative research and development arrangements and government awards.

Product revenues decreased $13.1 million or 27% in 2012 compared to 2011 due to a decrease in product sales to both generic and innovator pharmaceutical customers. Product revenues from our statin-family of products decreased by $9.1 million in 2012 compared to 2011. Our 2011 sales of statin-family of products benefited from generics manufacturers stocking inventory in anticipation of the Lipitor patent expiration in 2012. Our 2012 sales of statin-family of products were negatively impacted subsequent to the Lipitor patent expiration as the industry consumed its inventory and delayed additional orders of our statin-

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family of products. Due to the New Arch Enzyme Supply Agreement, as described above, which became effective on November 1, 2012, we expect the resulting decrease in sales of statin-family of products will result in a decrease in our product revenues in all future periods.

Additionally, product revenues from our products used in on-patent pharmaceuticals decreased during 2012 compared to 2011 by $4.8 million, specifically $1.9 million for products used in hepatitis C therapies, $1.6 million for products used in cancer therapies, and $1.3 million for products used in diabetic therapies. The decrease is primarily due to the delay of product orders of our products used in hepatitis C and diabetic therapies from late 2012 to early 2013. Further, the decrease in 2012 for products used in cancer therapies is primarily due to the accelerated manufacturing process development and drug qualification by an innovator pharmaceutical manufacturer in 2011. We expect that our product revenues from products used in cancer therapies in 2013 will remain comparable with 2012.

Collaborative research and development revenues were $50.1 million for 2012 and consisted of $45.3 million in revenues under the Shell Research Agreement and $4.8 million for collaborative research and development revenues from pharmaceutical customers.

Our collaborative research agreement with Shell terminated effective August 31, 2012 and as a result, our collaborative research and development revenues derived from Shell decreased $17.9 million to $45.3 million in 2012 compared to $63.2 million in 2011. This decrease is also a result of no Shell milestone payments earned during 2012 while $5.6 million were earned during 2011. We had an average of 116 FTEs in this collaboration until the termination on August 31, 2012. During 2011, we had an average of 124 FTEs in this collaboration.

Our other collaborative research and development revenues decreased $3.4 million due to $3.9 million decrease in our revenues from collaborations with Alstom in carbon management which was partially offset by $0.5 million increase in our pharmaceutical collaboration projects in 2012. Our research agreements with customers researching carbon capture technologies were concluded in December 2011. Our award from the United States Department of Energy expired in June 2012. We are no longer actively developing our carbon capture technology and do not expect any revenues from our carbon management program.

Government award revenues decreased $1.2 million during 2012 compared to 2011 as our award from the United States Department of Energy, or DOE, under the ARPA-E Recovery Act program concluded June 30, 2012, and our award from the EDB was terminated as a result of closing our Singapore facility. Our award revenue from the DOE was $1.6 million in 2012 compared to $2.2 million 2011. Our award from the EDB was $0.6 million during 2012 compared to $1.3 million in 2011. As of December 31, 2012, we do not have any government awards from which we expect to receive revenues in future periods. We may bid on additional awards from the United States and other governments in the future, but we cannot be certain that we will receive any such awards.

Our top five customers accounted for 83% and 77% of our total revenues in 2012 and 2011, respectively. Shell accounted for 51% and 51% of our total revenues in 2012 and 2011, respectively.

Cost of Product Revenues

	Years Ended December 31,		Change	
(In Thousands)	2012	2011	$	%
Cost of revenues:				
Product	$30,647	$41,781	$(11,134)	(27)%
Gross profit:				
Product	$5,277	$7,240	$(1,963)	(27)%
Product gross margin %	15%	15%		

Our cost of product revenues decreased $11.1 million in 2012 compared to 2011 primarily due to the $13.1 million decrease in our product sales. The decrease in product sales was primarily due to $9.1 million decrease in sales of our statin-family of products to generics manufacturers, which generally produce lower gross margins. Additionally, our products used in on-patent pharmaceuticals in hepatitis C therapies, in cancer therapies, and in diabetic therapies, which generally produce greater gross margins, had a combined decrease in product sales of $4.8 million. As a result, our gross margin in 2012 was 15%, the same as for 2011.

Our inventory balance decreased $3.2 million, or 71%, from $4.5 million as of December 31, 2011 to $1.3 million as of December 31, 2012 as a result of reduction of our enzyme inventory held at Arch by $1.8 million in preparation of the

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simplified enzyme sale arrangement that we entered into with Arch in November 2012. In-transit shipments as of December 31, 2011 accounted for $0.7 million of the reduction while there were no in-transit shipments as of December 31, 2012. Additionally, we wrote-off an additional $0.4 million of our inventory due to the continuous aging of inventory.

Operating Expenses

	Years Ended December 31,		Change	
(In Thousands)	2012	2011	$	%
Research and development	$56,785	$61,049	$(4,264)	(7)%
Selling, general and administrative	31,379	36,942	(5,563)	(15)%
Total operating expenses	$88,164	$97,991	$(9,827)	(10)%

Research and Development. Research and development expenses decreased $4.3 million in 2012 compared to 2011 primarily due to a $2.2 million decrease in compensation expenses (including $1.0 million decrease in stock-based compensation) as we significantly decreased headcount in the second half of 2012. Lab supplies decreased $1.3 million as a result of the termination of research efforts in the Shell Research Agreement in the second half of 2012 and our reduced headcount from the reduction in force announced in the third quarter of 2012. We reduced our travel costs $0.9 million and our outside services by $0.5 million as a result of the cost reduction measures and the termination of research efforts in the Shell Research Agreement. This was offset by an increase in depreciation costs of $0.9 million as a result of an expansion of lab space that we completed in early 2012. Research and development expenses included stock-based compensation expense of $2.3 million and $3.3 million during 2012 and 2011, respectively. The stock-based compensation expense decrease is attributable to canceled options resulting from the headcount reduction during 2012 and fewer outstanding options compared to 2011.

Selling, General and Administrative. Selling, general and administrative expenses decreased $5.6 million in 2012 compared to 2011 primarily due to a $4.6 million decrease in compensation expenses (including $3.4 million decrease in stock-based compensation) as we significantly decreased headcount in the second half of 2012. Outside services decreased $1.7 million related to decreased consulting costs of $0.9 million, decreased legal costs of $0.5 million and decreased accounting costs of $0.3 million. Our travel costs decreased $0.8 million due to decreased international travel. Selling, general and administrative expenses included stock-based compensation expense of $2.7 million and $6.1 million during 2012 and 2011, respectively. The stock-based compensation expense decrease is attributable to canceled options resulting from the headcount reduction during 2012 and fewer outstanding options compared to 2011.

Restructuring Charges

All Plans	Severance, benefits and related personnel costs	Facility closing costs	Total
Balance at 12/31/2011	$—	$—	$—
Restructuring charges	1,376	320	1,696
Cash payments	(1,123)		(1,123)
Adjustments to previously accrued charges	(153)	—)	(153)
Balance at 12/31/2012	$100	$320	$420

During the third quarter of 2012, our board of directors approved and committed to a restructuring plan (the “Q3 2012 Restructuring Plan”) to reduce our cost structure which included approximately 173 employee terminations in the United States and Singapore and the closing of our Singapore facility. Approximately 150 of the total 173 employee terminations impacted the research and development functions with remaining 23 employees impacting the general and administrative functions. We anticipate these terminations will reduce our 2013 personnel cost in the United States by $16.9 million. We are in the process of vacating one of our Redwood City facilities and marketing it for sublease. We anticipate our expected 2013 cost reductions resulting from restructuring our operation in the United States will be $22.1 million, but the actual amount of cost reductions will depend on a number of factors, including our ability to obtain a sublessee for the vacated facility we seek to sublease and our ability to reduce other non-personnel-related costs. Our total 2013 cost reductions resulting from closing our operations in Singapore is

expected to be $7.1 million.

Our cost of the Q3 2012 Restructuring Plan was $2.4 million, comprised of $1.1 million of leasehold improvement write down, $0.7 million for employee severance and other termination benefits, $0.3 million for facility lease termination costs and $0.3 million for equipment disposal charges. As of December 31, 2012, planned costs of $1.5 million have been recognized in

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selling, general and administrative expenses and $0.9 million have been recognized in research and development on our consolidated statements of operations. We have made cash payments of $0.6 million as of December 31, 2012, with $68,000 recorded in accrued compensation and $0.4 million recorded as accrued expenses on our consolidated balance sheet as of December 31, 2012. We anticipate recording no further costs under this restructuring plan. We anticipate the remaining costs under the Q3 2012 Restructuring Plan will be paid by the end of the first half of 2013.

The table below summarizes the changes in our restructuring accrual for the Q3 2012 Restructuring Plan (in thousands):

	Severance, benefits and related personnel costs	Facility closing costs	Total
Balance at 12/31/2011	$—	$—	$—
Restructuring charges	804	320	1,124
Cash payments	(611)	—	(611)
Adjustments to previously accrued charges	(93)	—	(93)
Balance at 12/31/2012	$100	$320	420

During the first quarter of 2012, our board of directors approved and committed to a restructuring plan (the "Q1 2012 Restructuring Plan") to reduce our cost structure, which included a total of 13 employee terminations in Hungary, Singapore, and the United States. The total planned cost of the Q1 2012 Restructuring Plan was $567,000, comprised of employee severance and other termination benefits. As of December 31, 2012, actual costs of $572,000 have been recognized in selling, general and administrative expenses on our consolidated statements of operations. We have made cash payments of $512,000 and recorded $60,000 of reductions to previously recorded charges and have no further obligations under this restructuring plan. We do not anticipate recording any further charges under this restructuring plan.

The table below summarizes the changes in our restructuring accrual for the Q1 2012 Restructuring Plan (in thousands):

	Severance, benefits and related personnel costs
Balance at 12/31/2011	$—
Restructuring charges	572
Cash payments	(512)
Adjustments to previously accrued charges	(60)
Balance at 12/31/2012	$—

Other Income (Expense), net

	Years Ended December 31,		Change	
(In Thousands)	2012	2011	$	%
Interest income	$252	$273	$(21)	(8)%
Interest expense and other, net	(326)	(675)	349	(52)%
Total other income (expense), net	$(74)	$(402)	$328	(82)%

Interest Income. Interest income decreased $21,000 due to decreased balances in our cash, cash equivalents and marketable securities in 2012 compared to 2011.

Interest Expense and Other, Net. Interest expense and other, net, decreased $0.3 million during 2012 compared to 2011 related to decreased losses from foreign currency translations primarily related to our operations in Hungary, India and Singapore.

Provision for Income Taxes

The tax provision for 2012 and 2011 primarily consisted of income taxes attributable to foreign operations and expenses related to uncertain tax positions.

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Years Ended December 31, 2011 and 2010
Revenues

	Years Ended December 31,		Change		
(In Thousands)	2011	2010	$	%	
Product	$49,021	$32,835	$16,186	49	%
Collaborative research and development	71,368	70,196	1,172	2	%
Government awards	3,476	4,073	(597)	(15)	%
Total revenues	$123,865	$107,104	$16,761	16	%

Revenues increased during the year ended December 31, 2011 compared to the year ended December 31, 2010, due to increases from product sales and collaborative research and development projects which were partially offset by a decline from government awards.

Product revenues increased $16.2 million or 49% in 2011 compared to 2010 primarily due to an increase in product sales to both generic and innovator pharmaceutical customers. Product revenues from our statin-family of products increased $10.1 million in 2011 compared to 2010. Our 2011 sales of statin-family of products benefited from generics manufacturers stocking inventory in anticipation of the Lipitor patent expiration in 2012. Additionally, product revenues from our products used in on-patent pharmaceuticals increased $6.8 million in 2011 compared to 2010 primarily due to $4.3 million increase in sales of products used in hepatitis C therapies, $1.7 million for products used in cancer therapies, and $0.8 million for products used in dementia therapies. The increases were partially offset by $0.9 million decrease in sales of products used in diabetic therapies.

Collaborative research and development revenues increased $1.2 million in 2011 compared to 2010 primarily due to $3.9 million increase in our revenues from collaborations with Alstom in carbon management partially offset by a $2.9 million decrease in our collaboration revenues related to Shell. Our pharmaceutical collaboration projects increased $0.3 million in 2011.

Collaborative research and development revenues derived from Shell decreased $2.9 million to $63.2 million in 2011 compared to $66.1 million in 2010. This includes milestone payments of $5.6 million and $7.4 million earned during 2011 and 2010, respectively. We achieved four of six milestone targets in 2011 and seven of eight milestone targets in 2010. Effective August 2011, Shell reduced the number of funded FTEs engaged in our research and development collaboration with them from 128 to 116 FTEs. This reduction was to FTEs located in the United States. We had an average of 124 and 128 FTEs in this collaboration during the years ended December 31, 2011 and 2010, respectively. The decrease in the number of Shell funded FTEs in our collaborative research and development revenues during the year ended December 31, 2011 was partially offset by contractual increases in the billing rates for those FTEs.

Government awards revenues decreased $0.6 million in 2011 due to the recognition of an award from the EDB for $1.3 million in 2011 compared to $3.2 million in 2010. This decrease was partially offset by an increased award from the United States Department of Energy of $2.2 million in 2011, compared to $0.9 million in 2010.

Our top five customers accounted for 77% and 85% of our total revenues in 2011 and 2010, respectively. Shell accounted for 51% and 62% of our total revenues in 2011 and 2010, respectively.

Cost of Product Revenues

	Years Ended December 31,		Change		
(In Thousands)	2011	2010	$	%	
Cost of revenues:					
Product	$41,781	$27,982	$13,799	49	%
Gross profit:					
Product	$7,240	$4,853	$2,387	49	%
Product gross margin %	15 %	15 %			

Cost of product revenues increased $13.8 million in 2011 compared to 2010 primarily due to an increase in product sales of $16.2 million. The increase in product sales was primarily due to $10.1 million increase in sales of our statin-family of products to generics manufacturers, which generally produce lower gross margins. Additionally, our

products used in on-patent

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pharmaceuticals in hepatitis C therapies, in cancer therapies, in diabetic therapies, and in dementia therapies, which generally produce greater gross margins, had a net increase of $5.9 million. As a result, gross margins in 2011 were flat at 15% for 2011 and 2010.

Our inventory balance increased $1.7 million, or 59%, from $2.8 million as of December 31, 2010 to $4.5 million as of December 31, 2011 primarily due to $0.7 million of in-transit shipments and $0.9 million of our enzyme inventory held at Arch as of December 31, 2011.

Operating Expenses

	Years Ended December 31,		Change		
(In Thousands)	2011	2010	$	%	
Research and development	$61,049	$52,405	$8,644	16	%
Selling, general and administrative	36,942	33,841	3,101	9	%
Total operating expenses	$97,991	$86,246	$11,745	14	%

Research and Development. Research and development expenses increased $8.6 million in 2011 compared to 2010 primarily due to a $2.8 million increase in amortization related to our October 2010 acquisition of the Maxygen IP. Our royalty fees paid to Maxygen were zero in 2011 compared to $1.2 million in 2010. The decrease is a result of our acquisition of the Maxygen IP and therefore we are no longer obliged to pay royalties to Maxygen. Additionally, compensation expenses (including stock-based compensation) increased $2.2 million due to increases in headcount. We increased costs approximately $1.0 million for additional product development batches for our research and development efforts. Outside services increased $1.0 million in connection with development cost for our contract manufacturers and lab space expansions. Lab supplies increased $0.9 million to support our increased headcount and ongoing development work. Our facility costs increased $0.8 million primarily as a result of costs to expand our space in Redwood City, California. Costs of information technology equipment and services increased $0.7 million in support of the additional headcount and expanded capabilities. Our travel costs increased $0.5 million primarily related to increased international travel. Research and development expenses include stock-based compensation expense of $3.3 million and $3.4 million during 2011 and 2010, respectively.

Selling, General and Administrative. Selling, general and administrative expenses increased $3.1 million in 2011 compared to 2010 primarily due to a $1.4 million increase in compensation expenses (including stock-based compensation) as we increased headcount. Outside services increased $0.7 million related to increased consulting costs. Recruiting and relocation costs increased $0.6 million in support our increased headcount. Our travel costs increased $0.5 million due to increased international travel. Selling, general and administrative expenses included stock-based compensation expense of $6.1 million and $5.4 million during 2011 and 2010, respectively. The stock-based compensation expense increase is attributable to additional options granted and outstanding during 2011 compared to 2010.

Other Income (Expense), net

	Years Ended December 31,		Change		
(In Thousands)	2011	2010	$	%	
Interest income	$273	$166	$107	64	%
Interest expense and other, net	(675)	(1,199)	524	(44)	%
Total other income (expense), net	$(402)	$(1,033)	$631	(61)	%

Interest Income. Interest income increased $0.1 million due to higher average interest rates received on our cash, cash equivalents and marketable securities balances during 2011 compared to 2010.

Interest Expense and Other, Net. Interest expense and other, net, decreased $0.5 million during 2011 compared to 2010 due to $0.7 million expense from the fair value adjustment related to our preferred stock warrants in 2010 that did not reoccur in 2011 and a decrease in interest expense of $0.5 million due to the payoff of our debt obligation on the GE Capital Loan also in 2010. These were offset by an increase of $0.4 million in unrealized foreign exchange losses primarily related to our operations in Hungary and $0.4 million of other income derived in 2010 from contractual arrangements with Arch that did not reoccur in 2011.

Provision for Income Taxes

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The tax provision for 2011 and 2010 primarily consisted of income taxes attributable to foreign operations and expenses related to uncertain tax positions.

Liquidity and Capital Resources

	December 31,	
(In Thousands)	2012	2011
Cash and cash equivalents	$32,003	$25,762
Marketable securities	13,524	27,720
Accounts receivable, net	7,545	18,917
Accounts payable, accrued compensation and accrued liabilities	14,097	24,503
Working capital (1)	43,486	50,940

(1) Working capital consists of total current assets less total current liabilities.

We have historically experienced negative cash flow from operations as we continue to invest in our infrastructure, our technology platform, and expand our business. Our cash flows from operations will continue to be affected principally by our headcount, primarily in research and development. The timing of hiring of skilled research and development personnel affects cash flows in particular as there is a lag between the hiring of research and development personnel and the generation of collaboration or product revenues and cash flows from those personnel. Our primary source of cash flows from operating activities is cash receipts from our customers for purchases of products from us or research and development services. Our largest uses of cash from operating activities are for employee-related expenditures, rent payments, inventory purchases to support our product revenue and non-payroll research and development costs. We currently intend to continue our investment in research and development.

The Shell Research Agreement terminated effective as of August 31, 2012, and we do not expect to receive further collaboration revenues from Shell. We have derived a substantial portion of our revenues from the Shell Research Agreement. Collaborative research and development revenues received from Shell were $45.3 million, $63.2 million and $66.1 million in 2012, 2011 and 2010, respectively, and accounted for 51%, 51% and 62% of our total revenues in 2012, 2011 and 2010, respectively. We are in early-stage discussions with multiple parties about potential collaborations but we cannot assure you that any of our discussions will lead to collaborations or that any new collaboration will fully substitute for the termination of the Shell collaboration. We currently do not expect to receive development funding from Raízen to support our CodeXyme® cellulase enzyme program. We are also exploring other strategic options for our CodeXyme® cellulase enzyme program. If we are unable to agree to terms with new collaborators that provide us with the financial assistance and infrastructure necessary for us to develop and commercialize our products and execute our strategy with respect to CodeXyme® cellulase enzymes, or if we are unable to identify and effect attractive strategic options for that program, we may need to fund this development ourselves, which will have a material adverse effect on our liquidity and financial condition, or we may need to suspend the program, which may have a material adverse effect on our business and prospects.

As a result of the expected significant decrease in revenues following the termination of the Shell Research Agreement, we implemented a significant restructuring plan in the third quarter of 2012. This restructuring plan, when completed in early 2013, will result in the closure of our research facility in Singapore, the closure of a facility in Redwood City and the termination of approximately 173 of our more than 332 employees worldwide. As a result of these cost reductions, we anticipate total operating cost reduction of $29.2 million for the year ended December 31, 2013.

Although we believe that, based on our current level of operations, our existing cash, cash equivalents and marketable securities will provide adequate funds for ongoing operations, planned capital expenditures and working capital requirements for at least the next 12 months, we may need additional capital if our current plans and assumptions change. Our need for additional capital will depend on many factors, including the financial success of our pharmaceutical business, identifying business partners to fund our cellulase program and our CodeXol® detergent alcohol program, or identifying other strategic options with respect to such programs, our spending to develop and commercialize new and existing products, the effect of any acquisitions of other businesses, technologies or facilities that we may make or develop in the future, our spending on new market opportunities, including bio-based chemicals,

and the filing, prosecution, enforcement and defense of patent claims. If our capital resources are insufficient to meet our capital requirements, and we are unable to enter into or maintain collaborations with partners that are able or willing to fund our development efforts or commercialize any products that we develop or enable, we will have to raise additional funds to continue the development of our technology and products and complete the commercialization of products, if any, resulting from our technologies. If future financings involve the issuance of

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equity securities, our existing stockholders would suffer dilution. If we raise debt financing, we may be subject to restrictive covenants that limit our ability to conduct our business. We may not be able to raise sufficient additional funds on terms that are favorable to us, if at all. If we fail to raise sufficient funds and fail to generate sufficient revenues to achieve planned gross margins and to control operating costs, our ability to fund our operations, take advantage of strategic opportunities, develop products or technologies, or otherwise respond to competitive pressures could be significantly limited. If this happens, we may be forced to delay or terminate research or development programs or the commercialization of products resulting from our technologies, curtail or cease operations or obtain funds through collaborative and licensing arrangements that may require us to relinquish commercial rights, or grant licenses on terms that are not favorable to us. If adequate funds are not available, we will not be able to successfully execute our business plan or continue our business.

	Years Ended December 31,		
(In Thousands)	2012	2011	2010
Net cash used in operating activities	$(11,892)	$(490)	$(16,383)
Net cash provided by/ (used in) investing activities	16,711	(48,808)	(5,166)
Net cash provided by financing activities	1,257	2,579	62,239
Effect of exchange rate changes on cash and cash equivalents	165	85	(79)
Net increase (decrease) in cash and cash equivalents	$6,241	$(46,634)	$40,611

Cash Flows from Operating Activities

Our operating activities in 2012 used cash of $11.9 million, primarily due to our net loss of $30.9 million in 2012, decreases in our accounts payable of $6.7 million resulting from the timing of our vendor payments and decreases in our accrued expenses of $3.3 million primarily from lower employee-accrued compensation, and increases in prepaid expenses and other current assets of $3.1 million primarily due to advances to our contract manufacturer. These were partially offset by decreases in accounts receivable of $11.4 million primarily due to decreased product revenues and decreases in product inventory of $3.2 million primarily due to the New Arch Enzyme Supply Agreement entered into with Arch in the fourth quarter of 2012. We also had net non-cash charges of $20.4 million, comprised primarily of non-cash share-based compensation expense of $5.1 million, $8.9 million in depreciation and amortization of property and equipment and $3.5 million in amortization of intangible assets. Additionally, we had non-cash charges of $0.8 million related to an other-than-temporary impairment of our equity investment in CO_2 Solutions and $1.6 million in non-cash charges related to the disposal of property and equipment resulting from our restructuring efforts during 2012.

Our operating activities in 2011 used cash of $0.5 million, primarily due to our net loss of $16.6 million in 2011, and increases in accounts receivable of $3.6 million due to increased product revenues and the timing of payments from Shell and a decrease in deferred revenues of $4.3 million primarily as a result of billings to Shell recognized to revenue during 2011. We also had net non-cash charges of $21.6 million, comprised primarily of non-cash share-based compensation expense of $9.4 million, $7.8 million in depreciation and amortization of property and equipment and $3.7 million in amortization of intangible assets.

Our operating activities in 2010 used cash of $16.4 million, primarily due to our net loss of $8.5 million in 2010, and increases in accounts receivable of $8.1 million due to increased product revenues and the timing of payments from Shell and a decrease in deferred revenues of $15.1 million primarily as a result of 2009 billings to Shell recognized to revenue during 2010. We also had net non-cash charges of $19.0 million, comprised primarily of non-cash share-based compensation expense of $8.7 million, $7.2 million in depreciation and amortization of property and equipment and $1.1 million in amortization of intangible assets.

Cash Flows from Investing Activities

In 2012, cash provided by investing activities totaled $16.7 million and primarily consisted of a net decrease in marketable securities of $19.6 million, offset by capital expenditures of $2.9 million primarily related to improvements for our facility expansion and purchase of lab equipment.

In 2011, cash used in investing activities totaled $48.8 million and primarily consisted of a net increase in marketable securities of $38.0 million and capital expenditures of $10.7 million primarily related to improvements for our facility expansion and purchase of development and lab equipment.

In 2010, cash used in investing activities totaled $5.2 million and primarily consisted of capital expenditures of $7.0 million primarily related to leasehold improvements for lab space expansion and purchase of manufacturing and lab equipment and $20.7 million for the acquisition of the Maxygen IP, funded by a net decrease in marketable securities of $23.2 million.

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We expect our capital expenditures to be approximately $2.5 million for 2013. In the future, we will continue to make laboratory equipment purchases to support our research and development efforts and growth strategy.

Cash Flows from Financing Activities

In 2012, our financing activities provided $1.3 million of cash from exercises of stock options.

In 2011, our financing activities provided $2.6 million of cash from exercises of stock options.

In 2010, our financing activities provided $62.2 million, including gross proceeds received related to our IPO of $72.5 million and $1.6 million from exercises of stock options offset by payments in preparation for our IPO of $3.9 million and the payoff of our financing obligations of $8.0 million.

Contractual Obligations and Commitments

The following summarizes the future commitments arising from our contractual obligations at December 31, 2012 (in thousands):

	Total	2013	2014	2015	2016	2017	2018 and beyond
Operating leases	$20,604	$3,112	$2,947	$3,031	$3,047	$2,677	$5,790
Total	$20,604	$3,112	$2,947	$3,031	$3,047	$2,677	$5,790

We have excluded from the above table $1.5 million in contractual obligations related to uncertain tax positions as we cannot make a reasonably reliable estimate of the period of cash settlement.

Off-Balance Sheet Arrangements

As of December 31, 2012, we had no off-balance sheet arrangements as defined in Item 303(a)(4) of Regulation S-K as promulgated by the SEC.

Accounting Guidance Update

Recently Adopted Accounting Guidance

In September 2011, the FASB issued ASU 2011-08 that simplifies goodwill impairment tests. The new guidance states that a “qualitative” assessment may be performed to determine whether further impairment testing is necessary. We adopted this accounting standard January 1, 2012, and the adoption of this guidance did not have a material impact to our financial statements or disclosures.

In June 2011, the FASB issued ASU 2011-05 that eliminates the option to present items of other comprehensive income (“OCI”) as part of the statement of changes in stockholders’ equity, and instead requires either, OCI presentation and net income in a single continuous statement in the statement of operations, or as a separate statement of comprehensive income. This new guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2011, with early adoption permitted. The Company adopted this update in the fourth quarter of 2012. The adoption of this accounting guidance did not have a material impact on our financial statements.

In May 2011, the FASB issued ASU 2011-04 that clarifies and changes some fair value measurement principles and disclosure requirements. Among them is the clarification that the concepts of highest and best use and valuation premise in a fair value measurement, should only be applied when measuring the fair value of nonfinancial assets. Additionally, the new guidance requires quantitative information about unobservable inputs, and disclosure of the valuation processes used and narrative descriptions with regard to fair value measurements within the Level 3 categorization of the fair value hierarchy. We adopted this accounting standard on January 1, 2012. The adoption of this new guidance did not have a material impact on our financial statements or disclosures.

Recent Accounting Guidance Not Yet Effective

In February 2013, the FASB issued ASU 2013-02 related to the reporting of amounts reclassified out of accumulated other comprehensive income that requires entities to report, either on their income statement or in a footnote to their financial statements, the effects on earnings from items that are reclassified out of other comprehensive income. The new guidance will be effective for the Company in the first quarter of 2013. We do not expect the adoption of this accounting standard to have a material impact on our financial statements or disclosures.

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ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Interest Rate Sensitivity

We had unrestricted cash and cash equivalents totaling $32.0 million at December 31, 2012. These amounts were invested primarily in money market funds and are held for working capital purposes. We had current and non-current marketable securities holdings of $13.5 million and $3.6 million, respectively. These amounts were invested primarily in corporate bonds, commercial paper, and United States government obligations and United States Government-sponsored enterprise securities and are held for working capital purposes. We do not enter into investments for trading or speculative purposes. We believe we do not have material exposure to changes in fair value as a result of changes in interest rates. Declines in interest rates, however, will reduce future investment income. If overall interest rates fell by 10% in 2013, our interest income would have declined by approximately $28,000, assuming consistent investment levels.

Foreign Currency Risk

Our operations include manufacturing and sales activities in the United States, Austria, Belgium, France, Germany, Italy, Japan and India, as well as research activities in countries outside the United States, including Singapore and Hungary. Our results of operations and cash flows are subject to fluctuations due to changes in foreign currency exchange rates. For example, we purchase materials for, and pay employees at, our research facility in Hungary in Hungarian Forint. In addition, we purchase products for sale in the United States from foreign companies and have agreed to pay them in currencies other than the United States dollar. As a result, our expenses and cash flows are subject to fluctuations due to changes in foreign currency exchange rates. In periods when the United States dollar declines in value as compared to the foreign currencies in which we incur expenses, our foreign-currency based expenses increase when translated into United States dollars. Although it is possible to do so, we have not hedged our foreign currency since the exposure has not been material to our historical operating results. Although substantially all of our sales are denominated in United States dollars, future fluctuations in the value of the United States dollar may affect the price competitiveness of our products outside the United States. The effect of a 10% adverse change in exchange rates on foreign denominated receivables as of December 31, 2012 would have been a $0.2 million foreign exchange loss recognized as a component of interest expense and other, net in our consolidated statement of operations. We may consider hedging for our foreign currency risk in the future.

Equity Price Risk

As described further in Note 4 to the consolidated financial statements, we have an investment in common shares of CO_2 Solutions Inc., a company based in Quebec City, Canada, or CO_2 Solutions, whose shares are publicly traded in Canada on the TSX Venture Exchange. During 2012, we evaluated our investment in the common shares of CO_2 Solutions. At the time of the evaluation the fair value of our investment in CO_2 Solutions' common stock was $0.6 million and our carrying cost for the investment was $1.3 million and we determine the impairment was other-than-temporary considering the length of time and extent to which the fair value had been less than our cost, the financial condition and near term prospects of CO_2 Solutions, and our management's ability and intent to hold the securities until fair value recovers. As a result of our analysis, we recorded an impairment of $0.8 million during 2012 as an expense in our consolidated statement of operations as selling, general and administrative expense.

This investment is exposed to fluctuations in both the market price of CO_2 Solutions' common shares and changes in the exchange rates between the United States dollar and the Canadian dollar. The effect of a 10% adverse change in the market price of CO_2 Solutions' common shares as of December 31, 2012 would have been an unrealized loss of approximately $61,000, recognized as a component of our consolidated statement of comprehensive loss. The effect of a 10% adverse change in the exchange rates between the United States dollar and the Canadian dollar as of December 31, 2012 would have been an unrealized loss of approximately $61,000, recognized as a component of our consolidated statements of comprehensive loss.

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ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA
Codexis, Inc.
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Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders

Codexis, Inc.

We have audited Codexis Inc.'s internal control over financial reporting as of December 31, 2012, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (the COSO criteria). Codexis Inc.'s management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's report on internal control over financial reporting. Our responsibility is to express an opinion on the company's internal control over financial reporting based on our audit.

We conducted our audit in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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

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

A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis. The following material weakness has been identified and included in management's assessment. Management has identified a material weakness in controls related to the Company's accounting for complex, non-routine transactions. We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of Codexis, Inc. as of December 31, 2012 and 2011, and the related consolidated statements of operations, comprehensive income, redeemable convertible preferred stock and stockholders' equity (deficit) and cash flows for each of the three years in the period ended December 31, 2012. This material weakness was considered in determining the nature, timing and extent of audit tests applied in our audit of the 2012 consolidated financial statements, and this report does not affect our report dated April 2, 2013, which expressed an unqualified opinion on those consolidated financial statements.

In our opinion, because of the effect of the material weakness described above on the achievement of the objectives of the control criteria, Codexis, Inc. has not maintained effective internal control over financial reporting as of December 31, 2012, based on the COSO criteria.

/s/ Ernst & Young LLP

San Jose, California

April 2, 2013

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Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders

Codexis, Inc.

We have audited the accompanying consolidated balance sheets of Codexis, Inc. (the Company) as of December 31, 2012 and 2011, and the related consolidated statements of operations, comprehensive income, redeemable convertible preferred stock and stockholders' equity (deficit) and cash flows for each of the three years in the period ended December 31, 2012. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Codexis, Inc. at December 31, 2012 and 2011, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 2012, in conformity with U.S. generally accepted accounting principles.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), Codexis, Inc.'s internal control over financial reporting as of December 31, 2012, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated April 2, 2013 expressed an adverse opinion thereon.

/s/ Ernst & Young LLP

San Jose, California

April 2, 2013

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Codexis, Inc.
Consolidated Balance Sheets
(In Thousands, Except Per Share Amounts)

	December 31, 2012	2011
Assets		
Current assets:		
Cash and cash equivalents	$32,003	$25,762
Marketable securities	13,524	27,720
Accounts receivable, net of allowances of $150 and $17 at December 31, 2012 and 2011, respectively	7,545	18,917
Inventories	1,302	4,488
Prepaid expenses and other current assets	5,395	2,345
Total current assets	59,769	79,232
Restricted cash	1,511	1,511
Non-current marketable securities	3,623	10,348
Property and equipment, net	16,650	24,176
Intangible assets, net	12,934	16,442
Goodwill	3,241	3,241
Other non-current assets	2,237	972
Total assets	$99,965	$135,922
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$3,654	$10,364
Accrued compensation	3,495	6,785
Other accrued liabilities	6,948	7,354
Deferred revenues	2,186	3,789
Total current liabilities	16,283	28,292
Deferred revenues, net of current portion	1,299	1,485
Other long-term liabilities	3,943	3,455
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, $0.0001 par value per share; 5,000 and 5,000 shares authorized at December 31, 2012 and 2011, respectively; None issued and outstanding at December 31, 2012 and 2011, respectively;	—	—
Common stock, $0.0001 par value per share; 100,000 shares authorized at December 31, 2012 and 2011, respectively; 37,692 and 35,996 shares issued and outstanding at December 31, 2012 and 2011, respectively;	4	4
Additional paid-in capital	294,128	287,792
Accumulated other comprehensive loss	(136)	(407)
Accumulated deficit	(215,556)	(184,699)
Total stockholders' equity	78,440	102,690
Total liabilities and stockholders' equity	$99,965	$135,922

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Codexis, Inc.
Consolidated Statements of Operations
(In Thousands, Except Per Share Amounts)

	Years Ended December 31,		
	2012	2011	2010
Revenues:			
Product	$35,924	$49,021	$32,835
Collaborative research and development	50,127	71,368	70,196
Government awards	2,247	3,476	4,073
Total revenues	88,298	123,865	107,104
Costs and operating expenses:			
Cost of product revenues	30,647	41,781	27,982
Research and development	56,785	61,049	52,405
Selling, general and administrative	31,379	36,942	33,841
Total costs and operating expenses	118,811	139,772	114,228
Loss from operations	(30,513)	(15,907)	(7,124)
Interest income	252	273	166
Interest expense and other, net	(326)	(675)	(1,199)
Loss before provision for income taxes	(30,587)	(16,309)	(8,157)
Provision for income taxes	270	241	384
Net loss	$(30,857)	$(16,550)	$(8,541)
Net loss per share of common stock, basic and diluted	(0.84)	(0.46)	(0.35)
Weighted average common shares used in computing net loss per share of common stock, basic and diluted	36,768	35,674	24,594

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Codexis, Inc.
Consolidated Statements of Comprehensive Loss
(In Thousands)

	Years Ended December 31,		
	2012	2011	2010
Net loss	$(30,857)	$(16,550)	$(8,541)
Other comprehensive income (loss):			
Foreign currency translation adjustments	165	(3)	(37)
Reclassification of other-than-temporary loss in marketable securities included in net loss	753	—	—
Unrealized gain (loss) on marketable securities, net of tax	(647)	(370)	255
Other comprehensive income (loss)	271	(373)	218
Total comprehensive loss	$(30,586)	$(16,923)	$(8,323)

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Codexis, Inc.
Consolidated Statements of Redeemable Convertible Preferred Stock and Stockholders' Equity (Deficit)
(In Thousands)

	Redeemable Convertible Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount				
December 31, 2009	25,199	$ 179,672	2,670	$—	$15,015	$ (252)	$ (159,608)	$ (144,845)
Exercise of common warrants	—	—	42	—	—	—	—	—
Exercise of stock options	—	—	810	—	1,594	—	—	1,594
Vesting of shares exercised early	—	—	—	—	13	—	—	13
Employee stock-based compensation	—	—	—	—	8,468	—	—	8,468
Non-employee stock-based compensation	—	—	—	—	386	—	—	386
Conversion of preferred stock to common stock at initial public offering	(25,199)	(179,672)	25,307	3	179,669	—	—	179,672
Shares issued for initial public offering, net of issuance costs	—	—	6,000	1	67,710	—	—	67,711
Conversion of preferred stock warrants	—	—	—	—	2,686	—	—	2,686
Cash paid in lieu of partial shares	—	—	—	—	(1)	—	—	(1)
Total comprehensive loss	—	—	—	—	—	218	(8,541)	(8,323)
December 31, 2010	—	—	34,829	4	275,540	(34)	(168,149)	107,361
Exercise of stock options	—	—	1,167	—	2,579	—	—	2,579
Employee stock-based compensation	—	—	—	—	9,286	—	—	9,286
Non-employee stock-based compensation	—	—	—	—	387	—	—	387
Total comprehensive loss	—	—	—	—	—	(373)	(16,550)	(16,923)
December 31, 2011	—	—	35,996	4	287,792	(407)	(184,699)	102,690
	—	—	3	—	—	—	—	—

Exercise of common warrants								
Exercise of stock options	—	—	708	—	1,257	—	—	1,257
Cancellation of shares	—	—	(17)	—	(65)	—	—	(65)
Release of stock awards	—	—	982	—	—	—	—	—
Employee stock-based compensation	—	—	—	—	5,040	—	—	5,040

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Non-employee stock-based compensation	—	—	20	—	104	—	—	104
Total comprehensive loss	—	—	—	—	—	271	(30,857)	(30,586)
December 31, 2012	—	$—	37,692	$4	$294,128	$(136)	$(215,556)	$78,440

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Codexis, Inc.
Consolidated Statements of Cash Flows
(In Thousands)

	Years Ended December 31,		
	2012	2011	2010
Operating activities:			
Net loss	$(30,857)	$(16,550)	$(8,541)
Adjustments to reconcile net loss to net cash used in operating activities:			
Amortization of intangible assets	3,509	3,716	1,063
Depreciation and amortization of property and equipment	8,908	7,755	7,246
Revaluation of redeemable convertible preferred stock warrant liability	—	—	677
Loss on disposal of property and equipment	1,551	49	148
Impairment of marketable securities	753	—	—
Extinguishment of royalty payable	—	—	461
Gain from extinguishment of asset retirement obligation	(212)	(124)	—
Stock-based compensation	5,076	9,431	8,737
Common stock issuances for royalty payment to a licensor	68	—	—
Accretion of asset retirement obligation	30	39	146
Amortization of debt discount	—	—	26
Accretion of premium/discount on marketable securities	697	771	511
Changes in operating assets and liabilities:			
Accounts receivable	11,372	(3,583)	(8,087)
Inventories	3,186	(1,671)	98
Prepaid expenses and other current assets	(3,051)	(682)	13
Other assets	(1,330)	513	2,814
Accounts payable	(6,710)	1,156	(2,105)
Accrued compensation	(3,290)	(1,322)	1,589
Other accrued liabilities	197	4,351	(6,048)
Deferred revenues	(1,789)	(4,339)	(15,131)
Net cash used in operating activities	(11,892)	(490)	(16,383)
Investing activities:			
Increase in restricted cash	—	(45)	(735)
Purchase of property and equipment	(2,933)	(10,736)	(6,990)
Purchase of marketable securities	(20,638)	(52,564)	(49,051)
Purchase of Maxygen patent portfolio	—	—	(20,705)
Proceeds from sale of marketable securities	10,397	6,037	1,605
Proceeds from maturities of marketable securities	29,885	8,500	70,695
Proceeds from disposal of property and equipment	—	—	15
Net cash used in investing activities	16,711	(48,808)	(5,166)
Financing activities:			
Principal payments on financing obligations	—	—	(8,026)
Payments in preparation for initial public offering	—	—	(3,870)
Proceeds from issuance of common stock on IPO, net of underwriting discounts	—	—	72,541
Proceeds from exercises of stock options	1,257	2,579	1,594
Net cash provided by financing activities	1,257	2,579	62,239
Effect of exchange rate changes on cash and cash equivalents	165	85	(79)

Net increase (decrease) in cash and cash equivalents	6,241	(46,634	) 40,611
Cash and cash equivalents at the beginning of the period	25,762	72,396	31,785
Cash and cash equivalents at the end of the period	$32,003	$25,762	$72,396

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Supplemental disclosures of cash flow information:			
Cash paid for interest	$—	$—	$350
Cash paid for income taxes	$126	$89	$336
Supplemental schedule of non-cash investing and financing activities:			
Reclassification of preferred stock warrant from liability to additional paid-in capital	$—	$—	$2,686
Conversion of preferred stock to common stock and additional paid-in capital	$—	$—	$179,672

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Codexis, Inc.
Notes to Consolidated Financial Statements
1. Description of Business
We were incorporated in Delaware in January 2002. We engineer enzymes for pharmaceutical, biofuel and chemical production. Our proven technologies enable scale-up and implementation of biocatalytic solutions to meet customer needs for rapid, cost-effective and sustainable process development, from research to manufacturing.
We have commercialized our technology and products in the pharmaceuticals market, which is our primary business focus. There are currently over 50 pharmaceutical firms using our technology, products and services in their manufacturing process development, including in the production of some of the world's bestselling and fastest growing drugs.
We are developing our CodeXyme® cellulase enzymes to convert non-food plant material, which we call cellulosic biomass, into affordable sugars, which can then be converted into renewable fuels and chemicals. We are also developing our own manufacturing process for CodeXol® detergent alcohols, which are bio-based chemicals. Detergent alcohols are used to manufacture surfactants, which are key, active cleaning ingredients in consumer products such as shampoos, liquid soaps and laundry detergents. We are seeking collaboration partners to assist us with the development and commercialization of CodeXyme® cellulase enzymes and CodeXol® detergent alcohols, and we are also exploring other strategic options with respect to these products and technologies.
We create our products by applying our CodeEvolver® directed evolution technology platform, which introduces genetic mutations into microorganisms, giving rise to changes in the enzymes that they produce. Once we identify potentially beneficial mutations, we test combinations of these mutations until we have created variant enzymes that exhibit marketable performance characteristics superior to competitive products. This process allows us to make continuous, efficient improvements to the performance of our enzymes.
In these Notes to Consolidated Financial Statements, the “Company,” “we,” “us” and “our” refer to Codexis, Inc. and its subsidiaries on a consolidated basis.
2. Summary of Significant Accounting Policies
Basis of Presentation and Consolidation
The consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America (“GAAP”) and the applicable rules and regulations of the Securities and Exchange Commission (“SEC”) and include the accounts of Codexis, Inc. and our wholly-owned subsidiaries. We have subsidiaries in the United States, Brazil, Hungary, India, Mauritius, The Netherlands and Singapore. All significant intercompany balances and transactions have been eliminated in consolidation.
Significant Risks and Uncertainties
We incurred net losses of $30.9 million, $16.6 million and $8.5 million for the years ended December 31, 2012, 2011 and 2010, respectively. We used $11.9 million, $0.5 million and $16.4 million of cash in operating activities for the years ended December 31, 2012, 2011 and 2010, respectively. At December 31, 2012, we had an accumulated deficit of $215.6 million and unrestricted cash and cash equivalents of $32.0 million. We may be required to seek additional funds through collaborations or public or private debt or equity financings, and may also seek to reduce expenses related to our operations. There can be no assurance that any financing will be available or at terms acceptable to us.
Use of Estimates
The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosures of contingent liabilities at the date of the consolidated financial statements, and the reported amounts of revenues and expenses during the reporting period. Our management regularly assesses these estimates which primarily affect revenue recognition, the valuation of marketable securities and accounts receivable, intangible assets, goodwill arising out of business acquisitions, inventories, accrued liabilities, common stock, and stock options and the valuation allowances associated with deferred tax assets. Actual results could differ from those estimates and such differences may be material to the consolidated financial statements.
Foreign Currency Translation

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The assets and liabilities of foreign subsidiaries, where the local currency is the functional currency, are translated from their respective functional currencies into United States dollars at the exchange rates in effect at the balance sheet date, with resulting foreign currency translation adjustments recorded in consolidated statement of comprehensive loss.

Revenue and expense amounts are translated at average rates during the period. Accumulated other comprehensive income (loss) included cumulative translation adjustment gain of $1,000 at December 31, 2012 and loss of $165,000 at December 31, 2011.

Where the United States dollar is the functional currency, nonmonetary assets and liabilities originally acquired or assumed in other currencies are recorded in United States dollars at the exchange rates in effect at the date they were acquired or assumed. Monetary assets and liabilities denominated in other currencies are translated into United States dollars at the exchange rates in effect at the balance sheet date. Translation adjustments are recorded in interest expense and other, net in the accompanying consolidated statements of operations. Gains and losses realized from transactions, including intercompany balances not considered as permanent investments, denominated in currencies other than an entity's functional currency, are included in interest expense and other, net in the accompanying consolidated statements of operations.

Concentrations of Credit Risk

Financial instruments that potentially subject us to significant concentrations of credit risk consist primarily of cash and cash equivalents, marketable securities, accounts receivable and restricted cash. Cash and cash equivalents, marketable securities and restricted cash are invested through banks and other financial institutions in the United States, as well as in other foreign countries. Such deposits may be in excess of insured limits.

Credit risk with respect to accounts receivable exists to the full extent of amounts presented in the consolidated financial statements. We periodically require collateral to support credit sales. We estimate an allowance for doubtful accounts through specific identification of potentially uncollectible accounts receivable based on an analysis of our accounts receivable aging. Uncollectible accounts receivable are written off against the allowance for doubtful accounts when all efforts to collect them have been exhausted. Recoveries are recognized when they are received. Actual collection losses may differ from our estimates and could be material to our consolidated financial position, results of operations, and cash flows.

Customers with accounts receivables balance of 10% or more of our total receivables balance consist of the following:

	Percentage of accounts receivable as of December 31,			
	2012		2011	
Customers				
Pharmaceutical Customer A	53	%	1	%
Pharmaceutical Customer B	11	%	—	%

We do not believe the accounts receivable from these customers represent a significant credit risk based on past collection experiences and the general creditworthiness of these customers.

Fair Value of Financial Instruments

The carrying amounts of certain of our financial instruments, including cash and cash equivalents, marketable securities, restricted cash, accounts receivable and accounts payable, approximate fair value due to their short maturities.

Fair value is considered to be the price at which an asset could be exchanged or a liability transferred (an exit price) in an orderly transaction between knowledgeable, willing parties in the principal or most advantageous market for the asset or liability. Where available, fair value is based on or derived from observable market prices or other observable inputs. Where observable prices or inputs are not available, valuation models are applied. These valuation techniques involve some level of management estimation and judgment, the degree of which is dependent on the price transparency for the instruments and the instruments' complexity.

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Cash, Cash Equivalents and Marketable Securities

We consider all highly liquid investments with maturity dates of three months or less at the date of purchase to be cash equivalents. Cash and cash equivalents consist of cash on deposit with banks and money market funds. The majority of cash and cash equivalents are maintained with major financial institutions in North America. Deposits with these financial institutions may exceed the amount of insurance provided on such deposits. Marketable securities included in current assets are comprised of corporate bonds, commercial paper, government-sponsored enterprise securities and United States Treasury obligations. Marketable securities included in non-current assets are comprised of corporate bonds and United States Treasury obligations that have a maturity date greater than 1 year. Our investment in common shares of CO2 Solutions Inc. (“CO2 Solutions”) is included in non-current marketable securities.

We perform separate evaluations of impaired debt and equity securities to determine if the unrealized losses as of the balance sheet date are other-than-temporary impairment.

For our investments in equity securities, our evaluation considers a number of factors including, but not limited to, the length of time and extent to which the fair value has been less than cost, the financial condition and near term prospects of the issuer, and our management’s ability and intent to hold the securities until fair value recovers. The assessment of the ability and intent to hold these securities to recovery focuses on our current and forecasted liquidity requirements, our capital requirements and securities portfolio objectives. Based on our evaluation, we concluded during the third quarter of 2012, the unrealized losses related to our equity investment in the common shares of CO_2 Solutions were other-than-temporary and as a result, we recorded $0.8 million as a selling, general and administrative expense in our consolidated statement of operations (see Note 6). As of December 31, 2012, there were no unrealized losses related to our equity securities.

For our investments in debt securities, our management determines whether we intend to sell or if it is more-likely-than-not that we will be required to sell impaired securities. This determination considers our current and forecasted liquidity requirements, our capital requirements and securities portfolio objectives. For all impaired debt securities for which there was no intent or expected requirement to sell, the evaluation considers all available evidence to assess whether it is likely the amortized cost value will be recovered. We conduct a regular assessment of our debt securities with unrealized losses to determine whether the securities have other-than-temporary impairment considering, among other factors, the nature of the securities, credit rating or financial condition of the issuer, the extent and duration of the unrealized loss, expected cash flows of underlying collateral and market conditions. As of December 31, 2012, there were no unrealized losses related to our debt securities.

Our investments in debt and equity securities are classified as available-for-sale and are carried at estimated fair value. Unrealized gains and losses are reported on the consolidated statement of comprehensive loss unless considered other-than-temporary. Amortization of purchase premiums and accretion of purchase discounts, realized gains and losses of debt securities and declines in value deemed to be other-than-temporary, if any, are included in interest income or interest expense and other, net. The cost of securities sold is based on the specific-identification method. There were no significant realized gains or losses from sales of marketable securities during the years ended December 31, 2012, 2011, and 2010.

Accounts Receivable

Accounts receivable represent amounts owed to us under our collaborative research and development agreements, product revenues and government awards. Our allowance for doubtful accounts was $150,000 and $17,000 as of December 31, 2012 and 2011, respectively. Specific accounts written off against the established reserve were $0, $12,000, and $0 during the years ended December 31, 2012, 2011 and 2010, respectively.

Inventories

Inventories consist of biocatalysts, which are enzymes or microbes that facilitate chemical reactions, and pharmaceutical intermediates. Internally produced biocatalysts only qualify as commercial inventory after they have achieved specifications that are required for selling the materials. Inventories held at our contract manufacturers are accepted as finished goods after achieving specifications stated in our purchase orders. Inventories are carried at the lower of cost or market. Cost is determined using the first-in first-out method or the specific identification method depending on location. Inventories, based on demand and age, are written down as excess and obsolete materials, if necessary.

Prepaid Expenses and Other Current Assets

Included in prepaid expenses and other current assets was $1.1 million in deferred cost of sales related to a sales arrangement with a customer that was deferred due to extended payment terms. This amount will be deferred until payment is received.

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Property and Equipment

Property and equipment, including the cost of purchased software, are stated at cost, less accumulated depreciation and amortization. Property and equipment also includes equipment that has been received but not yet placed in service. Depreciation is calculated using the straight-line method over the following estimated ranges of useful lives:

Asset classification	Estimated useful life
Laboratory equipment	5 years
Computer equipment and software	3 to 5 years
Office equipment and furniture	5 years
Leasehold improvements	Lesser of useful life or lease term

Impairment of Long-Lived Assets and Intangible Assets

Long-lived and intangible assets with finite lives are reviewed for impairment whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. Recoverability of these assets is measured by comparison of their carrying amounts to future undiscounted cash flows the assets are expected to generate.

The Company's intangible assets with finite lives consist of customer relationships, developed core technology, trade names, and the intellectual property (“IP”) rights associated with the acquisition of Maxygen's directed evolution technology in 2010. Intangible assets were recorded at their fair values at the date we acquired the assets and, for those assets having finite useful lives, are amortized using the straight-line method over their estimated useful lives. The Company's long-lived assets include property, plant and equipment, and other non-current assets.

We determined that we have a single entity wide asset group (“Asset Group”). The directed evolution technology patent portfolio acquired from Maxygen (“Core IP”) is the most significant component of the Asset Group since it is the base technology for all aspects of our research and development, and represents the basis for all of our identifiable cash flow generating capacity. Consequently, we do not believe that identification of independent cash flows associated with our long-lived assets is currently possible at any lower level than the Asset Group.

The Core IP is the only finite-lived intangible asset on our balance sheet as of December 31, 2012 and is considered the primary asset within the Asset Group. The remaining useful life of the Core IP extends through the fourth quarter of 2016. There has been no significant change in the utilization or estimated life of our Core IP since we acquired the technology patent portfolio from Maxygen. The estimated remaining useful life of our Core IP is not impacted by the termination of the Shell Research Agreement.

The carrying value of our long-lived assets in the Asset Group may not be recoverable based upon the existence of one or more indicators of impairment which could include: a significant decrease in the market price of the Company's common stock; current period cash flow losses or operating losses combined with a history of losses or a forecast of continuing losses associated with the use of the assets; slower growth rates in our industry; significant adverse changes in the business climate or legal factors; accumulation of costs significantly in excess of the amount originally expected for the acquisition or construction of the assets; loss of significant customers or partners; or the current expectation that the assets will more likely than not be sold or disposed of significantly before the end of their estimated useful life.

We evaluate recoverability of our long-lived assets and intangible assets based on the sum of the undiscounted cash flows expected to result from the use, and the eventual disposal of, the Asset Group. We make estimates and judgments about the future undiscounted cash flows over the remaining useful life of the Asset Group. Our anticipated future cash flows include our estimates of existing or in process product revenues, production and operating costs, future capital expenditures, working capital needs, and assumptions regarding the ultimate sale of the Asset Group at the end of the life of the primary asset. The useful life of the Asset Group was based on the remaining useful life of the Core IP, the primary asset.

As of December 31, 2012 we determined that our continued operating losses and the termination of the Shell Research Agreement were indications of impairment. Consequently, we tested our long-lived assets and intangible assets for

impairment as of December 31, 2012.

As part of a comprehensive strategic planning exercise the Company undertook in the fourth quarter of 2012 and early 2013, we developed a detailed multi-year operating plan of both revenue and expense. Our best-estimate of future cash flows used to test the recoverability of the Asset Group as of December 31, 2012 was developed directly from this plan using a forecast

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period consistent with the remaining useful life of the Core IP. Although our cash flow forecasts are based on assumptions that are consistent with our plans, there is significant exercise of judgment involved in determining the cash flows attributable to our Asset Group over its estimated remaining useful life.

The undiscounted cash flows included revenue and expense from our core pharmaceutical business and other enzyme markets adjacent to our pharmaceutical business. These adjacent enzyme businesses, which will leverage our Core IP and pharmaceutical technology and processes, include business opportunities in the fine chemical and enzymatic therapeutic markets.

We typically receive revenues from our core pharmaceutical business and expect to receive revenues from other enzyme markets adjacent to our pharmaceutical business in the form of one or more of the following: up-front payments, milestone payments, payments based upon the number of full-time employee equivalents, or FTEs, engaged in related research and development activities and licensing fees and royalties. Our best estimate of future cash flows does not include any CodeXol® and CodeXyme® revenues associated with collaboration research and development agreements, but does include an estimate of cash flows from potential strategic transactions with respect to our CodeXyme® and CodeXol® programs, as described below.

Approximately 69% and 31% of total Company revenues included in our estimated undiscounted cash flows (excluding cash flows from potential strategic transactions with respect to our CodeXyme® and CodeXol® programs) over the remaining useful life of the Core IP are derived from our core pharmaceutical business and adjacent enzyme opportunities, respectively.

Our core pharmaceutical business revenues are estimated based on existing commercial relationships, signed agreements or contracts, and conservative estimates for the capture of additional market share that management determined to be reasonably achievable. For existing and in process customer revenues we assumed a modest rate of growth based on our historical business model for our core pharmaceutical business, including research and development services revenue from partners and customers, which management determined to be reasonably achievable. We have historically worked closely with our pharmaceutical partners, such as Merck, to evolve, engineer and develop enzymes that meet their specific needs. Our business model is based on having our partners and customers pay in whole or in part for the research and development required to engineer the enzymes required.

In determining which adjacent enzyme markets to exploit, management assessed various segments of the large and growing enzyme markets and selected those adjacent markets where we already had entry points through our existing pharmaceutical business relationships, such as fine chemicals and enzymatic therapeutics markets. Estimated revenues associated with these adjacent markets are based on market penetration and adoption rates that management determined to be reasonably achievable.

We calculated our expected residual value in 2016 by applying a Gordon Growth Model to our estimated 2016 normalized net cash flows using a discount rate of 18% (“Estimated Weighted-Average Cost of Capital”), long term growth rate of 2%, and a capitalization factor of 6.25. The 18% discount rate reflects the nature and the risk of the underlying forecast, and includes such financial components as the risk free rate, systemic stock price risk based on an evaluation with peer companies (“beta”), equity risk premium, size premium, and company specific risk. The long term growth rate of 2% reflects projected inflation and general economic conditions. Based on these estimates, judgments, and factors, we determined that the residual value included in the undiscounted cash flows was $72.3 million.

We also included in the undiscounted cash flows an estimate of cash flows from potential strategic transactions with respect to our existing CodeXyme® cellulase enzymes and CodeXol® detergent alcohols programs. The amount of estimated cash flows was determined by probability weighting different scenarios to derive at a weighted average of most probable outcomes, with CodeXol® and CodeXyme® representing 11% and 27%, respectively, of the total undiscounted cash flows associated with the Asset Group. These amounts are not based on any existing signed contracts or agreements.

The result of our fourth quarter 2012 impairment analysis indicates that the undiscounted cash flows for the Asset Group are greater than the carrying value of the Asset Group by approximately 14%.

Any inability to align future production costs, operating costs, capital expenditures and working capital needs with significant changes in the timing and/or level of estimated future revenue could adversely impact our projected undiscounted cash flows. Future changes in the estimated useful life of our long-lived assets could also adversely

impact our projected undiscounted cash flows and result in future impairment charges. If it is determined that the Asset Group is not recoverable, an impairment loss would be calculated based on the excess of the carrying amount of the intangible and long-lived assets over the fair value. Any future impairment charges could have a material adverse effect on our financial position and results of operations.

Impairment of Goodwill

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Goodwill represents the excess of the purchase price over the fair value of assets acquired and liabilities assumed. Goodwill is presumed to have an indefinite life and is not subject to amortization. Goodwill is reviewed for impairment annually and whenever events or changes in circumstances indicate that the carrying value of the goodwill may not be recoverable.

We determined that the Company has only one operating segment and reporting unit under the criteria in ASC 280, Segment Reporting, and accordingly, all of our goodwill is associated with the Company. Our review of goodwill for indicators of impairment is performed at the Company level.

The goodwill impairment test consists of a two-step process. The first step of the goodwill impairment test, used to identify potential impairment, compares the fair value of the reporting unit to its carrying value. If the fair value of the reporting unit exceeds its carrying amount, goodwill of the reporting unit is considered not impaired, and the second step of the impairment test is not required.

We use our market capitalization as an indicator of fair value. We believe that since our reporting unit is publicly traded, the ability of a controlling shareholder to benefit from synergies and other intangible assets that arise from control might cause the fair value of our reporting unit as a whole to exceed its market capitalization. However, we believe that the fair value measurement need not be based solely on the quoted market price of an individual share of our common stock, but also can consider the impact of a control premium in measuring the fair value of our reporting unit.

Should our market capitalization be less than our total stockholder's equity as of our annual test date or as of any interim impairment testing date, we would also consider market comparables, recent trends in our stock price over a reasonable period and, if appropriate, use an income approach (discounted cash flow) to determine whether the fair value of our reporting unit is greater than our carrying amount.

If we were to use an income approach we would establish a fair value by estimating the present value of our projected future cash flows expected to be generated from our business. The discount rate applied to the projected future cash flows to arrive at the present value would be intended to reflect all risks of ownership and the associated risks of realizing the stream of projected future cash flows. Our discounted cash flow methodology would consider projections of financial performance for a period of several years combined with an estimated residual value. The most significant assumptions we would use in a discounted cash flow methodology are the discount rate, the residual value and expected future revenues, gross margins and operating costs, along with considering any implied control premium.

The second step, if required, compares the implied fair value of the reporting unit goodwill with the carrying amount of that goodwill. If the carrying amount of the reporting unit's goodwill exceeds its implied fair value, an impairment charge is recognized in an amount equal to that excess. Implied fair value is the excess of the fair value of the reporting unit over the fair value of all identified assets and liabilities.

Goodwill was tested for impairment as of October 1, 2012, the date of the Company's annual impairment review. The Company concluded that the fair value of the reporting unit exceeded the carrying value and no impairment existed. No impairment charges were recorded during the years ended December 31, 2012, 2011 and 2010.

Restricted Cash

Restricted cash consisted of amounts invested in money market accounts primarily for purposes of securing a standby letter of credit as collateral for our Redwood City, California facility lease agreement and for the purpose of securing a working capital line of credit. Restricted cash was unchanged during the year ended December 31, 2012. During the year ended December 31, 2011, restricted cash increased by $45,000 due to changes in our facility lease agreement and our working capital line of credit.

Revenue Recognition

Revenues are recognized when the four basic revenue recognition criteria are met: (1) persuasive evidence of an arrangement exists; (2) products have been delivered, transfer of technology has been completed or services have been rendered; (3) the fee is fixed or determinable; and (4) collectability is reasonably assured.

Our primary sources of revenues consist of collaborative research and development agreements, product revenues and government awards. Collaborative research and development agreements typically provide us with multiple revenue streams, including up-front fees for licensing, exclusivity and technology access, fees for FTE services and the potential to earn milestone payments upon achievement of contractual criteria and royalty fees based on future product

sales or cost savings by our customers. Our collaborative research and development revenues consist of revenues from Shell and revenues from other collaborative research and development agreements.

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Collaborative research and development revenues related to the arrangements with Shell consisted of the following (in thousands):

	Years Ended December 31,		
	2012	2011	2010
License, technology access and exclusivity fees	$3,403	$4,084	$4,084
Services	41,917	53,541	54,664
Milestones	—	5,554	7,400
Shell collaborative research and development revenues	$45,320	$63,179	$66,148

Other collaborative research and development revenues consisted of the following (in thousands):

	Years Ended December 31,		
	2012	2011	2010
License, technology access and exclusivity fees	$186	$686	$186
Services	1,785	5,804	2,695
Milestones	1,000	—	420
Royalties	1,836	1,699	747
Other collaborative research and development revenues	$4,807	$8,189	$4,048

For each source of collaborative research and development revenues, product revenues and award revenues, we apply the following revenue recognition criteria:

- Up-front fees received in connection with collaborative research and development agreements, including license fees, technology access fees, and exclusivity fees, are deferred upon receipt, are not considered a separate unit of accounting and are recognized as revenues over the relevant performance periods.
- Revenues related to FTE services recognized as research services are performed over the related performance periods for each contract. We are required to perform research and development activities as specified in each respective agreement. The payments received are not refundable and are based on a contractual reimbursement rate per FTE working on the project. When up-front payments are combined with FTE services in a single unit of accounting, we recognize the up-front payments using the proportionate performance method of revenue recognition based upon the actual amount of research and development labor hours incurred relative to the amount of the total expected labor hours to be incurred by us, up to the amount of cash received. In cases where the planned levels of research services fluctuate substantially over the research term, we are required to make estimates of the total hours required to perform our obligations. Research and development expenses related to FTE services under the collaborative research and development agreements approximate the research funding over the term of the respective agreements.
- A payment that is contingent upon the achievement of a substantive milestone is recognized in its entirety in the period in which the milestone is achieved. A milestone is an event (i) that can only be achieved based in whole or in part on either our performance or on the occurrence of a specific outcome resulting from our performance, (ii) for which there is substantive uncertainty at the date the arrangement is entered into that the event will be achieved, and (iii) results in additional payments being due to us. Milestones are considered substantive when the consideration earned from the achievement of the milestone (i) is commensurate with either our performance to achieve the milestone or the enhancement of value of the item delivered as a result of a specific outcome resulting from our performance, (ii) relates solely to past performance, and (iii) is reasonable relative to all deliverable and payment terms in the arrangement.
- Other payments received for which such payments are contingent solely upon the passage of time or the result of a collaborative partner's performance are recognized as revenue when earned in accordance with the contract terms and when such payments can be reasonably estimated and collectability is reasonably assured.
- We recognize revenues from royalties based on licensees' sales of products using our technologies. Royalties are recognized as earned in accordance with the contract terms when royalties from licensees can be reasonably estimated and collectability is reasonably assured.

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- We generate a significant percentage of our sales in India and other emerging markets. Customers in these countries are subject to significant economic and other challenges that affect their cash flow, and many customers outside the United States are generally accustomed to vendor financing in the form of extended payment terms which may exceed contractual payment terms. To remain competitive in markets outside the United States, we may offer selected customers such payment flexibility. We consider arrangements with extended payment terms not to be fixed or determinable, and accordingly, we defer revenue until payment is received. The costs associated with such revenue deferral are also deferred and classified as other current assets in the financial statements.
- Product revenues are recognized once passage of title and risk of loss has occurred and contractually specified acceptance criteria have been met, provided all other revenue recognition criteria have also been met. Product revenues consist of sales of biocatalysts, intermediates, active pharmaceutical ingredients and Codex Biocatalyst Panels and Kits. Cost of product revenues includes both internal and third party fixed and variable costs including amortization of purchased technology, materials and supplies, labor, facilities and other overhead costs associated with our product revenues.
- We licensed mutually agreed upon third party technology for use in our research and development collaboration with Shell. We recorded the license payments to research and development expense and offset by the related reimbursements received from Shell. These payments made by Shell to us are direct reimbursements of our costs. We accounted for these direct reimbursable costs as a net amount, whereby no expense or revenue is recorded for the costs reimbursed by Shell. For any payments not reimbursed by Shell, we recognized these as expenses in the statement of operations. We elected to present the reimbursements from Shell as a component of our research and development expense since presenting the receipt of payment from Shell as revenues does not reflect the substance of the arrangement.
- We receive payments from government entities for work performed in the form of government awards. Government awards are agreements that generally provide us with cost reimbursement for certain types of expenditures in return for research and development activities over a contractually defined period. Revenues from government awards are recognized in the period during which the related costs are incurred, provided that the conditions under which the government awards were provided have been met and we have only perfunctory obligations outstanding.
- Shipping and handling costs charged to customers are recorded as revenues. Shipping costs are included in our cost of product revenues. Such charges were not significant in any of the periods presented.

Milestone revenue

During 2012, we recognized, in collaborative research and development revenue, $1.0 million of milestone revenue from one of our pharmaceutical partners related to the use of our enzymes in its manufacturing processes. We received no other milestone revenue during the year ended December 31, 2012. We recorded milestone revenues of $5.6 million and $7.8 million for the years ended December 31, 2011 and 2010, respectively, which primarily related to collaborative research and development with Shell.

We evaluated the nature of the milestone triggering the contingent payment, and concluded that the amount can be recognized as a milestone payment based on the facts that (i) the milestone was achieved through successful performance by us, (ii) the milestone was at risk at the inception of the arrangement, (iii) the milestone was substantive in nature and is non-refundable, (iv) substantial effort was required by us to complete the milestone, (v) the amount of milestone payment is reasonable in relation to the value created in achieving the milestone, and (vi) the milestone payment relates solely to past performance. No further milestones payments are expected under this arrangement from this pharmaceutical partner.

Change in accounting estimate - United States Government awards

We recognize United States Government award revenue based on reimbursable costs incurred. Reimbursable costs include only allocable, allowable and reasonable costs, as determined in accordance with the Federal Acquisition Regulations and the related Cost Accounting Standards as applicable to the United States Government award. Costs incurred include direct labor and materials that are directly associated with the individual award plus indirect overhead and general and administrative type costs based upon our provisional indirect billing rates submitted by us to the United States Department of Energy (“DOE”). Our provisional indirect billing rates are subject to audit by the DOE. Changes in estimates affecting reimbursable costs are recognized in the period in which the change becomes known.

During 2011, our provisional indirect billing rates for the award from the DOE under the ARPA-E Recovery Act were audited by the DOE resulting in a revision to our provisional indirect billing rates. The revised indirect rates were subsequently

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approved by the DOE during the first quarter of 2012. As a result of this change in accounting estimate, we invoiced and recognized $530,000 of additional award revenues during the first quarter of 2012 for reimbursable costs incurred by us in 2010 and 2011. The term of the award agreement concluded in June 2012 and no further revenue has been recognized since that date.

Customer Concentration

Customers with revenues of 10% or more of our total revenues consist of the following:

	Percentage of Total Revenues For The Years Ended December 31,		
	2012	2011	2010
Customers:			
Shell	51 %	51 %	62 %
Merck	13 %	10 %	10 %

Concentrations of Supply Risk

We rely on a limited number of suppliers for our products. We believe that other vendors would be able to provide similar products; however, the qualification of such vendors may require substantial start-up time. In order to mitigate any adverse impacts from a disruption of supply, we attempt to maintain an adequate supply of critical single-sourced materials. For certain materials, our vendors maintain a supply for us. We outsource the commercial scale manufacturing of our products to contract manufacturers with facilities in Austria, India and Italy.

Research and Development Expenses

Research and development expenses consist of costs incurred for internal projects as well as partner-funded collaborative research and development activities. These costs include direct and research-related overhead expenses, which include salaries, stock-based compensation and other personnel-related expenses, facility costs, supplies, depreciation of facilities and laboratory equipment, as well as research consultants and the cost of funding research at universities and other research institutions, and are expensed as incurred. Costs to acquire technologies that are utilized in research and development that have no alternative future use, are expensed when incurred.

Advertising

Advertising costs are expensed as incurred and included in selling, general and administrative expenses in the consolidated statements of operations. Advertising costs were $351,000, $113,000, and $55,000 for the years ended December 31, 2012, 2011, and 2010, respectively.

Income Taxes

We use the liability method of accounting for income taxes. Deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to differences between the consolidated financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Deferred tax assets are recognized for deductible temporary differences, along with net operating loss ("NOL") carryforwards, if it is more likely than not that the tax benefits will be realized. To the extent a deferred tax asset cannot be recognized under the preceding criterion, a valuation allowance is established. Deferred tax assets and liabilities are measured using enacted tax rates in effect for the year in which those temporary differences are expected to be recovered or settled.

We recognize the financial statement effects of an uncertain tax position when it is more likely than not, based on the technical merits, that the position will be sustained upon examination.

Stock-Based Compensation

We recognize compensation expense related to share-based transactions, including the awarding of employee stock options, based on the estimated fair value of the awards granted. All awards granted, modified or settled after January 1, 2006 have been accounted for based on the fair value of the awards granted. We generally use the straight-line method to allocate stock-based compensation expense to the appropriate reporting periods. Some awards are accounted for using the accelerated method as appropriate for the terms of the awards.

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We account for stock options issued to non-employees based on their estimated fair value determined using the Black-Scholes option-pricing model. The fair value of the options granted to non-employees is re-measured as they vest, and the resulting change in value, if any, is recognized as an increase or decrease in stock compensation expense during the period the related services are rendered.

Net Loss per Share of Common Stock

Basic net loss per share of common stock is computed by dividing the net loss by the weighted-average number of shares of common stock outstanding during the period, less the weighted-average unvested common stock subject to repurchase. Diluted net loss per share of common stock is computed by giving effect to all potential common shares, consisting of stock options, warrants and redeemable convertible preferred stock, to the extent dilutive. Basic and diluted net loss per share of common stock was the same for each period presented as the inclusion of all potential common shares outstanding was anti-dilutive.

The following table presents the calculation of basic and diluted net loss per share of common stock (in thousands, except per share amounts):

	Years Ended December 31,		
	2012	2011	2010
Numerator:			
Net loss	$(30,857)	$(16,550)	$(8,541)
Denominator:			
Weighted-average shares of common stock outstanding	36,768	35,674	24,597
Weighted-average shares of common stock subject to repurchase	—	—	(3)
Weighted-average shares of common stock used in computing net loss per share of common stock, basic and diluted	36,768	35,674	24,594
Net loss per share of common stock, basic and diluted	$(0.84)	$(0.46)	$(0.35)

The following options to purchase common stock, restricted stock units and warrants to purchase common stock were excluded from the computation of diluted net loss per share of common stock for the periods presented because including them would have had an anti-dilutive effect (in thousands):

	Years Ended December 31,		
	2012	2011	2010
Options to purchase common stock	6,133	7,904	7,796
Restricted stock units	958	546	—
Warrants to purchase common stock	260	266	266
Total	7,351	8,716	8,062

Reclassifications

Certain amounts in prior period financial statements related to Shell including related party collaboration revenue (see Note 3), related party receivable and related party deferred revenue, have been reclassified to the corresponding non-related party account, since effective July 1, 2011, Shell is no longer considered a related party (see Note 7). Our investment in CO_2 Solutions (See Note 4), has been reclassified from non-current other assets to non-current marketable securities and the composition of our deferred tax assets have been reclassified to conform to the current period presentation.

Accounting Guidance Update

Recently Adopted Accounting Guidance

In September 2011, the FASB issued ASU 2011-08 that simplifies goodwill impairment tests. The new guidance states that a “qualitative” assessment may be performed to determine whether further impairment testing is necessary. We adopted this accounting standard January 1, 2012, and the adoption of this guidance did not have a material impact to our financial statements or disclosures.

In June 2011, the FASB issued ASU 2011-05 that eliminates the option to present items of other comprehensive income (“OCI”) as part of the statement of changes in stockholders’ equity, and instead requires either, OCI presentation and net

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income in a single continuous statement in the statement of operations, or as a separate statement of comprehensive income. This new guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2011, with early adoption permitted. We adopted this update in the fourth quarter of 2012. The adoption of this accounting guidance did not have a material impact on our financial statements.

In May 2011, the FASB issued ASU 2011-04 that clarifies and changes some fair value measurement principles and disclosure requirements. Among them is the clarification that the concepts of highest and best use and valuation premise in a fair value measurement, should only be applied when measuring the fair value of nonfinancial assets. Additionally, the new guidance requires quantitative information about unobservable inputs, and disclosure of the valuation processes used and narrative descriptions with regard to fair value measurements within the Level 3 categorization of the fair value hierarchy. We adopted this accounting standard on January 1, 2012. The adoption of this new guidance did not have a material impact on our financial statements or disclosures.

Recent Accounting Guidance Not Yet Effective

In February 2013, the FASB issued ASU 2013-02 related to the reporting of amounts reclassified out of accumulated other comprehensive income that requires entities to report, either on their income statement or in a footnote to their financial statements, the effects on earnings from items that are reclassified out of other comprehensive income. The new guidance will be effective for the Company in the first quarter of 2013. We do not expect the adoption of this accounting standard to have a material impact on our financial statements or disclosures.

3. Collaborative Research and Development Agreements

Shell and Raízen

In November 2006, we entered into a collaborative research agreement and a license agreement with Shell to develop biocatalysts and associated processes that use such biocatalysts.

In November 2007, we entered into a new and expanded five-year collaborative research agreement (“Shell Research Agreement”) and a license agreement (the “Shell License Agreement”) with Shell. In connection with the Shell Research Agreement, we agreed to use our proprietary technology platform to discover and develop enzymes and microorganisms for use in converting cellulosic biomass into biofuels and related products and Shell agreed to pay us (i) research funding at specified rates per FTE working on the project during the research term, (ii) milestone payments upon the achievement of milestones, and (iii) royalties on future product sales. The Shell Research Agreement also specified certain minimum levels of FTE services that we were required to allocate to the collaboration efforts that increased over the term of the agreement, which was originally set to expire on November 1, 2012.

In September 2012, we entered into an agreement with Shell (the “New Shell Agreement”) which among other things, terminates the Shell Research Agreement effective as of August 31, 2012, except for certain provisions of the Shell Research Agreement which will survive such termination, including provisions regarding intellectual property rights, patent prosecution and maintenance, confidentiality and indemnification. The New Shell Agreement required Shell to pay us approximately $7.5 million as full, complete and final satisfaction of amounts that Shell may have owed us under the Shell Research Agreement with respect to (i) FTEs assigned to the Shell Research Agreement and (ii) milestones achieved or achievable by us under the Shell Research Agreement. The $7.5 million was recognized as revenue during the third quarter of 2012 when all of our obligations were fulfilled under the New Shell Agreement and was collected during the fourth quarter of 2012.

Beginning September 1, 2012, we have no further obligations to Shell under the Shell Research Agreement to provide any FTEs to perform work under or after the collaboration and Shell has no future obligations to us under the Shell Research Agreement to provide funding for FTEs to perform work under or after the collaboration. We remain eligible to receive a one-time $3.0 million payment from Shell under the Shell Research Agreement upon the first sale by Shell of a product in the field of converting cellulosic biomass into fermentable sugars in Brazil, or in the fields of converting fermentable sugars derived from biomass into liquid fuel or liquid fuel additives or into lubricants.

Under the New Shell Agreement, Shell granted us royalty-bearing, non-exclusive rights and licenses to develop, manufacture, use and sell enzymes and microbes in the field of converting cellulosic biomass into fermentable sugars on a worldwide basis, except for Brazil, where such sugars are converted into liquid fuels, fuel additives or lubricants (the “Field of Use”). Raízen holds the exclusive rights to use our enzymes and microbes for converting cellulosic

biomass into fermentable sugars in Brazil, where such sugars are converted into ethanol. Following the date on which our biocatalysts are used to produce sugars used in the Field of Use sufficient to produce 30.0 million gallons of liquid fuel, we will be required to pay Shell a royalty on our sales to third parties of our enzymes and microbes in the Field of Use, equal to a low single-digit percentage of net sales and we will also be required to pay Shell a royalty on our use of biocatalysts in the Field of Use, equal to a low single-digit percentage of

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our applicable net sales of such enzymes or microbes. Shell is also entitled to discounted pricing under the New Shell Agreement for biocatalysts purchased from us by Shell for use in the Field of Use, but we are under no obligation to sell such biocatalysts to Shell.

Under the New Shell Agreement, we also granted to Shell a non-exclusive, royalty-free license to manufacture, use and import, solely for the use of Shell and its affiliates, (i) enzymes developed by us during the ten year period following August 31, 2012 outside of the Shell Research Agreement for use in the Field of Use and (ii) improvements to any microbe developed by us during the ten year period following August 31, 2012 outside of the Shell Research Agreement that is derivative of an identified microbe for use in the Field of Use. Shell remains subject to existing royalty obligations to us for future sales of products covered by the intellectual property and technology that remain exclusively licensed to Shell under the License Agreement.

Additionally, with respect to each invention relating to technology or materials regarding novel liquid fuel compounds, liquid fuel additives or lubricants, Shell will continue to be required to work exclusively with us, for a period of three years after the first nonprovisional patent application filing for such invention, to identify biological methods of synthesis of the compound(s) that are claimed, or whose use as a liquid fuel compound, additive or lubricant, is claimed, in such patent filing.

The New Shell Agreement has a term that commences on August 31, 2012 and continues until the later of August 31, 2032 or the date of the last to expire patent rights included in our collaboration that claim a biocatalyst or a microbe for use in the Field of Use.

Prior to the New Shell Agreement, Shell had an obligation under the Shell Research Agreement to fund us at specified rates for each FTE, which as of August 2012, were equal to $460,000 on an annual basis for each FTE in the United States and $399,000 on an annual basis for each FTE in Hungary. As of August 31, 2012, the number of FTEs assigned to our collaboration with Shell was 116.

In accordance with our revenue recognition policy, the $20.0 million up-front exclusivity fee and the research funding fees to be received for FTE services are recognized in proportion to the actual research efforts incurred relative to the amount of total expected effort to be incurred by us over the five-year research period commencing November 2007. Milestones payments to be earned under this agreement were determined to be at risk at the inception of the arrangement and substantive and are expected to be recognized upon achievement of the applicable milestone and when collectability of such payment is reasonably assured. There are no further milestone payments under the Shell Research Agreement, other than a $3.0 million milestone payment described above for which we may become eligible. We recorded milestone revenues of zero, $5.6 million and $7.4 million during the years ended December 31, 2012, 2011 and 2010, respectively.

Under the Shell Research Agreement and Shell License Agreement, we had the right, if mutually agreed upon with Shell, to license technology from third parties that would assist us in meeting objectives under the collaboration and Shell was obligated to reimburse us for the licensing costs of the technology. Payments made by us to the third-party providers were recorded as research and development expenses related to our collaborative research agreement with Shell. Shell reimbursed us for licensing costs of $424,000, $199,000, and $1.4 million for the years ended December 31, 2012, 2011 and 2010, respectively. We record these reimbursements against the costs incurred.

In June 2011, Shell completed the transfer of all of its equity interests in us, together with the associated right to appoint one member to our board of directors, to Raízen, Shell's joint venture with Cosan S.A. Indústria e Comércio, ("Cosan") in Brazil. As a result, Shell is no longer considered a related party. Notwithstanding the above, Shell did not transfer the Shell Research Agreement to Raízen. Additionally in September 2011, we entered into a joint development agreement directly with Raízen. Work under this joint development agreement has been completed and we do not expect this project to continue.

Manufacturing Collaboration

In February 2010, we consolidated certain of the contractual terms in our then-existing agreements with Arch by simultaneously terminating all of our existing agreements with Arch, other than the Master Services Agreement with Arch entered into as of August 1, 2006, and entering into amended agreements with Arch. The amended agreements, among other things, provided for biocatalysts supplied from us to Arch and intermediates supplied from Arch to us. We sold biocatalysts to Arch at an agreed upon price, and Arch manufactured intermediates on our behalf. Arch sold

the intermediates to us at a formula-based or at an agreed upon price. We then directly marketed and sold the intermediates to a specified group of customers in the generic pharmaceutical industry. Under the amended agreements, Arch also sold intermediates directly to other customers, and a license royalty was owed by Arch to us based on the volume of product they sold to us and to their other customers. Royalties earned from Arch under this arrangement were $127,000 and $752,000 for the years ended December 31, 2012 and 2011, respectively.

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In November 2012, we entered into a new commercial arrangement with Arch by simultaneously terminating all of our existing supply agreements with Arch and entering into the New Arch Enzyme Supply Agreement pursuant to which Arch agreed to exclusively purchase enzymes from us for use in the manufacture of certain of Arch's products and we agreed to exclusively supply, with limited exceptions, certain of our enzymes to Arch at an agreed upon price for use in such manufacture. Under the New Arch Enzyme Supply Agreement, Arch will no longer produce atorva-family active pharmaceutical ingredients ("APIs") and intermediates for us and Arch will no longer pay us royalties on their sale of such APIs and intermediates to customers and we will no longer have exclusive rights to market such APIs and intermediates in certain markets.

4. Joint Development Agreement with CO2 Solutions

On December 15, 2009, we entered into an exclusive joint development agreement with CO_2 Solutions, a company based in Quebec City, Quebec, Canada, whose shares are publicly traded in Canada on TSX Venture Exchange. The joint development agreement expired in January 2011. Under the agreement, we obtained a research license to CO_2 Solutions's intellectual property and agreed to conduct research and development activities jointly with CO_2 Solutions with the goal of advancing the development of carbon management technology. We also purchased 10,000,000 common shares (approximately 16.6% of the total common shares outstanding at the time of investment) of CO_2 Solutions in a private placement subject to a four-month statutory resale restriction. This restriction expired on April 15, 2010. In July 2012, Alan Shaw, our former Chief Executive Officer resigned from the board of directors of CO_2 Solutions and we are currently considering potential replacements to this designated board seat.

In January 2011, we extended our joint development agreement with CO_2 Solutions on essentially the same terms as the original agreement. The extended agreement expires nine months after the expiry of any third party collaborations. This agreement expired in February 2013.

We concluded that through December 31, 2012, we did not have the ability to exercise significant influence over CO_2 Solutions' operating and financial policies. We consider our investment in CO_2 Solutions' common shares as an investment in a marketable security that is available for sale, and carry it at fair value in non-current marketable securities. As discussed in Note 6, we recorded an impairment of $0.8 million in our consolidated statement of operations as selling, general and administrative expense during the year ended December 31, 2012 with respect to this investment. Subsequent changes in fair value have been recognized in the consolidated statement of comprehensive loss. The fair value of our CO_2 Solutions' common shares as of December 31, 2012 was determined by trading on TSX Venture Exchange. Accordingly, we have classified our investment in CO2 Solutions as a Level 1 investment as discussed in Note 6.

5. Balance Sheets and Statements of Operations Details

Cash Equivalents, Marketable Securities and Other Investments

At December 31, 2012, cash equivalents, marketable securities and other investments consisted of the following (in thousands):

	December 31, 2012				
	Adjusted Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value	Average Contractual Maturities (in days)
Money market funds	$24,789	$—	$—	$24,789	n/a
Commercial paper	1,499	1	—	1,500	70
Corporate bonds (unamortized cost)	9,512	10	—	9,522	156
U.S. Treasury obligations (unamortized cost)	5,511	5	—	5,516	262
Common shares of CO2 Solutions	563	47	—	610	n/a
Total	$41,874	$63	$—	$41,937	

The total cash and cash equivalents balance of $32.0 million as of December 31, 2012 was comprised of money market funds of $24.8 million and cash of $7.2 million held with major financial institutions worldwide. At December 31, 2012, we had no marketable security in an unrealized loss position.

At December 31, 2011, cash equivalents, marketable securities and other investments consisted of the following (in thousands):

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	December 31, 2011				
	Adjusted Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value	Average Contractual Maturities (in days)
Money market funds	$18,866	$—	$—	$18,866	n/a
Commercial paper	1,999	—	—	1,999	55
Corporate bonds (unamortized cost)	30,908	29	(45)	30,892	270
U.S. Treasury obligations (unamortized cost)	998	4	—	1,002	274
Government-sponsored enterprise securities	3,003	12	—	3,015	373
Common shares of CO2 Solutions	1,316	—	(155)	1,161	n/a
Total	$57,090	$45	$(200)	$56,935	

The total cash and cash equivalents balance of $25.8 million as of December 31, 2011 was comprised of money market funds of $18.9 million and $6.9 million held as cash primarily with major financial institutions in North America. At December 31, 2011, we had 14 marketable securities, including corporate bonds and government-sponsored enterprise securities, in a loss position for less than 12 months with an aggregated unrealized loss of $46,000 and an aggregated fair value of $18.5 million.

Inventories

Inventories, net consisted of the following (in thousands):

	December 31,	
	2012	2011
Raw materials	$588	$2,779
Work in process	52	54
Finished goods	662	1,655
Total inventories	$1,302	$4,488

Property and Equipment, net

Property and equipment consisted of the following (in thousands):

	December 31,	
	2012	2011
Laboratory equipment	$33,776	$34,903
Leasehold improvements	4,388	13,058
Computer equipment and software	11,099	4,671
Office equipment and furniture	1,531	1,319
Construction in progress (1)	28	1,972
	50,822	55,923
Less: accumulated depreciation and amortization	(34,172)	(31,747)
Property and equipment, net	$16,650	$24,176

(1) Construction in progress also includes equipment received but not yet placed into service pending installation.

Due to the extension of the lease period for certain currently occupied facilities, we re-evaluated the depreciable lives of existing leasehold improvements, totaling $2.3 million in net book value at the time of reassessment in February 2011. Since leasehold improvements are typically depreciated over the lesser of the assets' useful life or the remaining lease period, the extension of contracted facilities leases through 2020 necessitated a change in our estimate of depreciable lives on leasehold improvements. While some lives have been shortened under this reassessment with the vacating of a portion of our facilities, the majority of depreciable lives have been extended up to as much as 5 years from the assets' in service date, in accordance with our leasehold improvements' standard useful lives. The net effect of this reassessment is lower monthly depreciation being recognized on leasehold improvements over a longer period of time. These changes' net effect on depreciation expense recognized is not expected to be material on a quarterly or

annual basis.

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Intangible Assets

Intangible assets consisted of the following (in thousands):

	December 31, 2012			December 31, 2011			
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Weighted-Average Amortization Period (years)
Customer relationships	$3,098	$(3,098)	$—	$3,098	$ (3,040)	$58	5
Developed and core technology	1,534	(1,534)	—	1,534	(1,457)	77	5
Maxygen intellectual property	20,244	(7,310)	12,934	20,244	(3,937)	16,307	6
Total	$24,876	$(11,942)	$12,934	$24,876	$ (8,434)	$16,442	6

The estimated amortization expense to be charged to research and development through the year ending December 31, 2016 is as follows at December 31, 2012 (in thousands):

Year ending December 31:	Total
2013	$3,374
2014	3,374
2015	3,374
2016	2,812
2017	—
	$12,934

Goodwill

There were no changes in the carrying value of goodwill during 2012, 2011 and 2010.

Interest Expense and Other, Net

Interest expense and other, net consisted of the following (in thousands):

	Years Ended December 31,		
	2012	2011	2010
Interest expense	$—	$—	$529
Foreign exchange losses	348	706	314
Re-measurement of redeemable convertible preferred stock warrant liabilities	—	—	677
Other	(22)	(31)	(321)
Interest expense and other, net	$326	$675	$1,199

6. Fair Value

Assets and liabilities recorded at fair value in the consolidated financial statements are categorized based upon the level of judgment associated with the inputs used to measure their fair value. Hierarchical levels which are directly related to the amount of subjectivity associated with the inputs to the valuation of these assets or liabilities are as follows:

Level 1 — Inputs that are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date.

Level 2 — Inputs (other than quoted prices included in Level 1) that are either directly or indirectly observable for the asset or liability through correlation with market data at the measurement date and for the duration of the instrument's anticipated life.

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Level 3 — Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities and which reflect management's best estimate of what market participants would use in pricing the asset or liability at the measurement date.

For Level 2 financial investments, our investment advisor provides us with monthly account statements documenting the value of each investment based on prices received from an independent third-party valuation service provider. This third party evaluates the types of securities in our investment portfolio and calculates a fair value using a multi-dimensional pricing model that includes a variety of inputs, including quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, interest rates and yield curves observable at commonly quoted intervals, volatilities, prepayment speeds, loss severities, credit risks and default rates that are observable at commonly quoted intervals. As we are ultimately responsible for the determination of the fair value of these instruments, we perform quarterly analyses using prices obtained from another independent provider of financial instrument valuations, to validate that the prices we have used are reasonable estimates of fair value.

The following table presents our financial instruments that were measured at fair value on a recurring basis at December 31, 2012 by level within the fair value hierarchy (in thousands):

	December 31, 2012			
	Level 1	Level 2	Level 3	Total
Financial Assets				
Money market funds	$24,789	$—	$—	$24,789
Commercial paper	—	1,500	—	1,500
Corporate bonds	—	9,522	—	9,522
U.S. Treasury obligations	—	5,516	—	5,516
Government-sponsored enterprise securities	—	—	—	—
Common shares of CO2 Solutions	610	—	—	610
Total	$25,399	$16,538	$—	$41,937

The following table presents our financial instruments that were measured at fair value on a recurring basis at December 31, 2011 by level within the fair value hierarchy (in thousands):

	December 31, 2011			
	Level 1	Level 2	Level 3	Total
Financial Assets				
Money market funds	$18,866	$—	$—	$18,866
Commercial paper	—	1,999	—	1,999
Corporate bonds	$—	$30,892	$—	$30,892
U.S. Treasury obligations	$—	$1,002	$—	$1,002
Government-sponsored enterprise securities	$—	$3,015	$—	$3,015
Common shares of CO2 Solutions	$1,161	$—	$—	$1,161
Total	$20,027	$36,908	$—	$56,935

We estimated the fair value of our investment in 10,000,000 common shares of CO_2 Solutions using the market value of common shares as determined by trading on the TSX Venture Exchange. Accordingly, we have classified our investment in CO_2 Solutions as a Level 1 investment. As of December 31, 2012, the fair value of our investment in CO_2 Solutions' common stock was $0.6 million with an unrealized gain of $47,000. During 2012, we evaluated our investment in the common shares of CO_2 Solutions and determined the impairment was other-than-temporary considering the length of time and extent to which the fair value has been less than our cost, the financial condition and near term prospects of CO_2 Solutions, and our management's ability and intent to hold the securities until fair value recovers. As a result of our analysis, we recorded an impairment of $0.8 million during the year ended December 31, 2012 as an expense in our consolidated statement of operations as selling, general and administrative expense. At December 31, 2011, the estimated fair value of our investment in CO_2 Solutions' common stock was $1.2 million and the unrealized loss was $155,000.

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The unrealized gain and loss for the years ended December 31, 2012 and 2011, respectively, is reflected on the consolidated statements of comprehensive loss, net of related tax expense of $69,000 recorded in 2012. No tax expense was recorded in 2011 as a result of the unrealized loss.

7. Related Party Transactions

Maxygen, Inc.

Maxygen was one of our stockholders until it distributed its holdings to its stockholders in December 2010, and so transactions between us and Maxygen prior to that time were considered related party transactions. In October of 2010, we acquired Maxygen's directed evolution technology patent portfolio for net consideration of $20.2 million including $20.0 million paid to Maxygen, transaction costs of $0.7 million and a royalty payable extinguishment of $0.5 million. We recorded an intangible asset for $20.2 million (see Note 5). In conjunction with this transaction, we terminated our existing license agreement with Maxygen including terminating our obligation to pay biofuels royalties to Maxygen.

During the year ended December 31, 2010, Maxygen provided to Codexis certain legal and administrative services, with total fees owed to Maxygen of $170,000. We had no amounts owed to Maxygen in connection with such services at December 31, 2012 and 2011, respectively.

In August 2006, we had entered into an amendment to the license agreement with Maxygen. Under the amendment, we were required to pay Maxygen a fee based on a percentage of all consideration we receive from third parties related to the use of certain intellectual property owned or controlled by Maxygen in the specified field of biofuels. We expensed all payments owed to Maxygen as they became due as collaborative research and development expenses, which we reported as research and development expenses in our consolidated statements of operations. We were also obligated to reimburse up to 20% of the costs incurred by Maxygen related to the prosecution and maintenance of the patents licensed from Maxygen relating to our core technology. We paid Maxygen a fee based on our collaborative research and development agreement with Shell (see Note 3). We expensed $1.2 million during the year ended December 31, 2010. No amounts were payable to Maxygen at December 31, 2012 or 2011, respectively.

Shell and Raízen

Prior to June 2011 Shell was considered a related party due to the size of its ownership interest. As discussed in Note 3, "Collaborative Research and Development Agreements," Shell transferred full ownership of our common stock to Raízen, Shell's joint venture with Cosan in Brazil. Based on our analysis and effective as of July 1, 2011, Shell was no longer considered a related party. Before June 30, 2011, related party receivables, related party deferred revenue, and related party collaboration research and development revenue were primarily comprised of transactions under our five-year Shell Research Agreement (replaced by the New Shell Agreement effective as of August 31, 2012) and the Shell License Agreement. The revenues earned from Shell are included in the collaborative research and development line on our consolidated statement of operations. Collaborative research and development revenue received from Shell accounted for 51%, 51% and 62% of our revenues for the years ended December 31, 2012, 2011 and 2010, respectively.

At the time of the transfer, Raízen owned 5.6 million shares of our common stock and has the right to appoint a member to our board of directors. In September 2011, we entered into a joint development agreement with Raízen to develop an improved first generation ethanol process with enhanced economics. There has been no material financial activity with Raízen through December 31, 2012 and work under this joint development agreement has been completed and we do not expect this project to continue.

Raízen has exclusive rights to market and use CodeXyme® in Brazil. We are engaged in discussions with Raízen about obtaining rights to market CodeXyme® to all ethanol producers in Brazil. Although we do not expect to receive development funding from Raízen for CodeXyme®, Raízen will remain a target customer for CodeXyme® should Raízen decide to build capacity for second generation ethanol in Brazil.

Exela PharmaSci, Inc.

We signed a license agreement with Exela PharmaSci, Inc. ("Exela") in 2007. A member of our board of directors is also on the board of directors of Exela. Under the terms of the agreement, Exela would pay us a royalty based on their achievement of certain commercial goals.

During the years ended December 31, 2012, and 2011, we recognized $150,000 and $450,000 of revenue, respectively, related to this arrangement, shown in our consolidated statement of operations as collaborative research and development revenue. We did not recognize any revenue from Exela prior to 2011. As of December 31, 2012 and 2011, we had no amounts owed from Exela.

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8. Commitments and Contingencies

Operating Leases

Our headquarters are located in Redwood City, California where we occupy approximately 107,000 square feet of office and laboratory space in four buildings. On March 16, 2011, we entered into a Fifth Amendment to Lease (the "Fifth Amendment") with Metropolitan Life Insurance Company ("MetLife") with respect to our offices located at 200 and 220 Penobscot Drive, Redwood City, California, (the "Penobscot Space"), 400 Penobscot Drive, Redwood City, California (the "Building 2 Space") and 640 Galveston Drive, Redwood City, California (the "Galveston Space"), and with respect to approximately 29,921 square feet of additional space located at 101 Saginaw Drive, Redwood City, California (the "Saginaw Space"). Under the Fifth Amendment, the term of the lease of the Penobscot Space, the Building 2 Space and the Saginaw Space lasts until January 31, 2020, and we have options to extend for two additional five year periods. Pursuant to the Fifth Amendment, we surrendered the Galveston Space in August 2011.

The Fifth Amendment provided a number of incentives to us including forgiveness of rent payments for the initial two months of the lease term, a tenant improvement allowance ("TIA") of $2.4 million and an additional $0.8 million special allowances for certain HVAC costs. We applied the TIA funds toward capital improvements to the expanded facility as well as upgrades and reconfiguration of existing lab and office space.

As of December 31, 2012, we incurred $3.6 million of capital improvement costs related to the facilities. During 2011, we requested and received $1.8 million of reimbursements from the landlord out of the TIA for the completed construction. We requested and received reimbursement of the remaining $1.3 million of TIA and special HVAC allowance during the second quarter of 2012. The TIA is recorded once cash is received and is amortized on a straight line basis over the term of the lease as a reduction in rent expense.

We also lease space in the 501 Chesapeake Drive, Redwood City, California (the "501 Chesapeake Space"). The lease for the 501 Chesapeake Space was not extended with the Fifth Amendment. In September 2012, we entered into a Sixth Amendment to Lease (the "Sixth Amendment") with MetLife with respect to the Company's offices located at 501 Chesapeake Drive. The Sixth Amendment extends the term of the lease of the 501 Chesapeake Space, which would have otherwise expired in January 2013, to January 31, 2017. Pursuant to the Sixth Amendment, we have two consecutive options to extend the term of the lease for the 501 Chesapeake Space for an additional period of five years per option.

As part of the Q3 2012 Restructuring Plan, we are in the process of vacating the Saginaw Space and we have begun marketing the facility for sublease (see Note 14).

Rent expense is recognized on a straight-line basis over the term of the lease. In accordance with the terms of the amended lease agreement, we exercised our right to deliver a letter of credit in lieu of a security deposit. The letters of credit in the amount of $707,000 as of December 31, 2012 and 2011 are collateralized by a deposit balances held by the bank. These deposits are recorded as restricted cash on the consolidated balance sheets.

We also rent facilities in Hungary. Rent expense is being recognized on a straight-line basis over the respective terms of these leases. Our leased facility in Singapore has been vacated and we recorded a cease use liability of $354,000 representing the remaining six months lease term for the facility as an accrued expense at December 31, 2012.

As of December 31, 2012 and 2011 we had asset retirement obligations of $109,000 and $579,000, respectively from operating leases, whereby we must restore the facilities that we are renting to their original form. We incurred $30,000 and $39,000 of accretion expense related to our asset retirement obligations in 2012 and 2011, respectively. We are expensing the asset retirement obligation over the terms of the respective leases. We review the estimated obligation each period and we make adjustments if our estimates change.

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Future minimum payments under noncancellable operating leases are as follows at December 31, 2012 (in thousands):

	Lease Payments
Years ending December 31,	
2013	$ 3,112
2014	2,947
2015	3,031
2016	3,047
2017	2,677
2018 and beyond	5,790
Total	$ 20,604

Litigation

We have been subject to various legal proceedings related to matters that have arisen during the ordinary course of business. Although there can be no assurance as to the ultimate disposition of these matters, we have determined, based upon the information available, that the expected outcome of these matters, individually or in the aggregate, will not have a material adverse effect on our consolidated financial position, results of operations or cash flows.

Indemnifications

We are required to recognize a liability for the fair value of any obligations we assume upon the issuance of a guarantee. We have certain agreements with licensors, licensees and collaborators that contain indemnification provisions. In such provisions, we typically agree to indemnify the licensor, licensee and collaborator against certain types of third party claims. The maximum amount of the indemnifications is not limited. We accrue for known indemnification issues when a loss is probable and can be reasonably estimated. There were no accruals for expenses related to indemnification issues for any periods presented.

Other contingencies

In November 2009, one of our foreign subsidiaries sold intellectual property to us. Under the local laws, the sale of intellectual property to a nonresident legal entity is deemed an export and is not subject to value added tax. However, there is uncertainty regarding whether the items sold represented intellectual property or research and development services, which would subject the sale to value added tax. We believe that the uncertainty results in an exposure to pay value added tax that is more than remote but less than likely to occur and, accordingly, have not recorded an accrual for this exposure. Should the sale be deemed a sale of research and development services, we could be obligated to pay an estimated amount of $0.6 million.

9. Warrants

Our outstanding warrants are exercisable for common stock at any time during their respective terms. During the year ended December 31, 2012, 6,066 warrants were exercised in a net share transaction to acquire 3,308 shares of our common stock. No warrants were exercised during 2011.

At December 31, 2012, the following warrants were issued and outstanding:

Issue Date	Shares Subject to warrants	Exercise Price per Share	Expiration
May 25, 2006	184,895	$5.96	May 25, 2013
July 17, 2007	2,384	12.45	February 9, 2016
September 28, 2007	72,727	8.25	September 28, 2017

10. Stockholders' Equity

In 2002, we adopted the 2002 Stock Plan (the "2002 Plan"), pursuant to which our board of directors issued incentive stock options, non-statutory stock options (options that do not qualify as incentive stock options) and restricted stock to our employees, officers, directors or consultants. In March 2010, our board of directors and stockholders approved the 2010 Equity Incentive Award Plan (the "2010 Plan"), which became effective upon the completion of our IPO in April 2010. A total of 1,100,000 shares of common stock were initially reserved for future issuance under the 2010 Plan and any shares of common

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stock reserved for future grant or issuance under our 2002 Plan that remained unissued at the time of completion of the IPO became available for future grant or issuance under the 2010 Plan. In addition, the shares reserved for issuance pursuant to the exercise of any outstanding awards under the 2002 Plan that expire unexercised will also become available for future issuance under the 2010 Plan. The 2010 Plan also provides for automatic annual increases in the number of shares reserved for future issuance, and during the year ended December 31, 2012 an additional 1,439,827 shares were reserved under the 2010 plan as a result of this provision. As of December 31, 2012, we had a total of 10,857,842 shares of common stock reserved for issuance under our Plans and no shares available for issuance under the 2002 Plan.

Options granted under the 2002 Plan and 2010 Plan expire no later than 10 years from the date of grant. For incentive stock options and nonstatutory stock options, the option price shall be at least 100% and 85%, respectively, of the fair value of the common stock on the date of grant, as determined by the board of directors. If, at the time of a grant, the optionee directly or by attribution owns stock possessing more than 10% of the total combined voting power of all of our outstanding capital stock, the exercise price for these options must be at least 110% of the fair value of the underlying common stock. Options typically vest over a four-year period at a rate of no less than 25% per year but may be granted with different vesting terms.

In June 2012, we granted 400,000 options and 750,000 restricted stock awards pursuant to the employment agreement with our new chief executive officer, Mr. John Nicols. The option award has a per share exercise price equal to $3.46 per share, which was the closing price of the Company’s common stock on June 13, 2012. Mr. Nicols will vest 25% of the option award on June 13, 2013 with the remaining shares vesting ratably on a monthly basis over a period of 36 months thereafter, such that the option award would be fully vested and exercisable on June 13, 2016. The restricted stock award of 750,000 shares vest over four years with 25% of the awards vesting on each annual anniversary such that the restricted stock award would be fully vested on June 13, 2016.

In September 2012, we granted 200,000 options and 50,000 restricted stock awards pursuant to the offer letter agreement with our new chief financial officer, Mr. David O’Toole. The option award has a per share exercise price equal to $2.72 per share, which was the closing price of the Company’s common stock on September 10, 2012. Mr. O’Toole will vest 25% of the option award on September 4, 2013 with the remaining shares vesting ratably on a monthly basis over a period of 36 months thereafter, such that the option award would be fully vested and exercisable on September 4, 2016. The restricted stock award of 50,000 shares vest over four years with 25% of the awards vesting on each annual anniversary of Mr. O’Toole’s start date such that the restricted stock award would be fully vested on September 4, 2016.

A summary of stock option activity is as follows:

		Options Outstanding	
	Shares Available for Grant	Number of Options	Weighted Average Exercise Price per Share
December 31, 2010	1,935,424	7,795,693	$6.27
Authorized	1,393,142	—	—
Grants	(1,751,506)	1,751,506	9.33
Exercises	—	(1,167,119)	2.21
Early exercised options repurchased	476,458	(476,458)	9.51
Forfeited/Cancelled	32,048	—	—
December 31, 2011	1,507,299	7,903,622	7.35
Authorized	3,712,138	—	
Granted options	(1,520,950)	1,520,950	3.42
Granted RSUs	(1,962,078)	—	—
Exercises	—	(707,599)	1.78
Forfeited/Cancelled options	2,584,332	(2,584,332)	—
Forfeited/Cancelled RSUs	568,960	—	8

Plan Shares Expired	(1,122,311)	—	—
December 31, 2012	3,767,390	6,132,641	$6.65

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The following table summarizes information about stock options outstanding and exercisable at December 31, 2012:

	Options Outstanding			Options Exercisable	
Exercise Prices	Number of Options	Weighted Average Remaining Contractual Term (Years)	Weighted Average Exercise Price per Share	Number of Options	Weighted Average Exercise Price per Share
$0.60 - $5.20	2,313,165	6.01	$2.66	1,084,768	$1.80
$5.20 - $8.63	1,573,714	3.35	7.22	1,500,998	7.19
$8.63 - $10.50	940,446	4.89	9.62	756,372	9.72
$10.50 - $11.87	1,305,316	4.86	10.89	1,080,739	10.91
	6,132,641	4.91	$6.65	4,422,877	$7.21

The following table summarizes information about stock options that are vested and are expected to vest as of December 31, 2012:

	Number of Options	Weighted Average Exercise Price per Share	Weighted Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value (In Thousands)
Vested	4,422,877	$7.21	3.39	$ 657
Expected to vest	1,478,396	5.37	8.78	—
Total vested and expected to vest	5,901,273	$6.75	4.74	$ 657

We granted 1,147,953 restricted stock units (“RSU”) during the year ended December 31, 2012. The RSUs vest over four years with 25% of the RSUs vesting annually. The fair value of the RSUs was calculated based on the NASDAQ quoted stock price on the date of the grant with the expense recognized over the vesting period. For the year ended December 31, 2012, we recorded $1.8 million of stock compensation expense related to the RSUs. During the year, 167,401