INTREXON CORP
Form 10-K
February 29, 2016
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

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

For the fiscal year ended December 31, 2015

OR

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

For the transition period from to .

Commission File Number: 001-36042

INTREXON CORPORATION

(Exact name of registrant as specified in its charter)

Virginia	26-0084895
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)
20374 Seneca Meadows Parkway Germantown, MD	20876
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code (301) 556-9900

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

Title of each class	Name of each exchange on which registered
Intrexon Corporation Common Stock, No Par Value	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

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Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes x No ¨

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 x

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 x 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 (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes x 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. x

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 definition of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

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

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

As of June 30, 2015, the aggregate market value of the registrant's common stock held by non-affiliates based upon the closing price of such shares on the New York Stock Exchange on such date was approximately $2.3 billion. Shares of common stock held by each executive officer, director and by each person who owns 5 percent or more of the outstanding common stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of February 15, 2016, 116,779,394 shares of common stock, no par value per share, were issued and outstanding.

DOCUMENTS INCORPORATED BY REFERENCE: Portions of the registrant's Definitive Proxy Statement for its 2016 Annual Meeting of Shareholders are incorporated by reference in Part III of this Annual Report on Form 10-K where indicated. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant's fiscal year ended December 31, 2015.

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Special Note Regarding Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, which statements involve substantial risks and uncertainties. All statements, other than statements of historical facts, included in this Annual Report on Form 10-K regarding our strategy, future events, future operations, future financial position, future revenue, projected costs, prospects, plans, objectives of management and expected market growth are forward-looking statements. The words "anticipate," "believe," "estimate," "expect," "intend," "may," "plan," "predict," "project," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. These forward-looking statements include, among other things, statements about:

- our current and future exclusive channel collaborations ("ECCs"), license agreements and other collaborations;
- developments concerning our collaborators and licensees;
- our ability to successfully enter new markets or develop additional products, whether with our collaborators or independently;
- competition from existing technologies and products or new technologies and products that may emerge;
- actual or anticipated variations in our operating results;
- actual or anticipated fluctuations in our competitors' or our collaborators' and licensees' operating results or changes in their respective growth rates;
- our cash position;
- market conditions in our industry;
- our ability, and the ability of our collaborators and licensees, to protect our intellectual property and other proprietary rights and technologies;
- our ability, and the ability of our collaborators and licensees, to adapt to changes in laws or regulations and policies;
- the ability of our collaborators and licensees to secure any necessary regulatory approvals to commercialize any products developed under the ECCs, license agreements and joint ventures;
- the ability of our collaborators and licensees to develop and successfully commercialize products enabled by our technologies;
- the rate and degree of market acceptance of any products developed by a collaborator under an ECC or through a joint venture or license under a license agreement;
- our ability to retain and recruit key personnel;
- our expectations related to the use of proceeds from our public offerings and other financing efforts; and
- our estimates regarding expenses, future revenue, capital requirements and needs for additional financing.

Forward-looking statements may also concern our expectations relating to our subsidiaries and other affiliates. We caution you that the foregoing list may not contain all of the forward-looking statements made in this Annual Report on Form 10-K.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included in this Annual Report on Form 10-K, particularly in Item 1A, "Risk Factors," that could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments that we may make.

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You should read this Annual Report on Form 10-K, the documents that we reference in this Annual Report on Form 10-K, the audited consolidated financial statements and related notes thereto included in this Annual Report on Form 10-K and the documents that we have filed as exhibits completely and with the understanding that our actual future results may be materially different from what we expect. We do not assume any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

PART I

Item 1. Business

At present rates of global industrialization and population growth, food and energy supplies and environmental and healthcare resources are becoming more scarce and/or costly. We believe it is not a viable option for mankind to continue on this path — new solutions will be necessary to preserve and globally expand a high quality of life. We believe that synthetic biology is a solution.

We believe we are a leader in the field of synthetic biology, an emerging and rapidly evolving discipline that applies engineering principles to biological systems to enable rational, design-based control of cellular function for a specific purpose. Using our suite of proprietary and complementary technologies, we design, build and regulate gene programs, which are DNA sequences that consist of key genetic components. A single gene program or a complex, multi-genic program is fabricated and stored within a DNA vector. Vectors are segments of DNA used as a vehicle to transmit genetic information. DNA vectors can, in turn, be introduced into cells in order to generate a simple or complex cellular system, which are the basic and complex cellular activities that take place within a cell and the interaction of those systems in the greater cellular environment. It is these genetically modified cell systems that can be used to produce biological effector molecules, or be employed directly to enable the development of new and improved products and manufacturing processes across a variety of end markets, including health, food, energy, environment and consumer. Our synthetic biology capabilities include the ability to precisely control the amount, location and modification of biological molecules to control the function and output of living cells and optimize for desired results at an industrial scale.

Working with our collaborators, we seek to create more effective, less costly and more sustainable solutions than can be provided through current industry practices. We believe our approach to synthetic biology can enable new and improved biotherapeutics, increase the productivity and quality of food crops and livestock, create sustainable alternative energy sources and chemical feed stocks, utilize biologically-based applications for the delivery of innovative consumer products and provide for a diverse set of environmental solutions. Our business model is to commercialize our technologies through exclusive channel collaborations, or ECCs, with collaborators that have industry expertise, development resources and sales and marketing capabilities to bring new and improved products and processes to market.

Our technologies combine the principles of precision engineering, statistical modeling, automation and production at an industrial scale. We efficiently engineer precise and complex gene programs across many cell types. We apply the engineering principle of a design-build-test-learn continuum, through which we accumulate knowledge about the characteristics and performance of gene programs and cell lines. This process of continuous learning allows us to enhance our ability to design and build improved and more complex gene programs and cellular systems.

While the field of synthetic biology is still emerging, the addressable markets that may benefit from this approach are large and well-established. In health, synthetic biology may provide new approaches to treating diseases, as well as improvements to the manufacture of existing products. It is estimated that the global human pharmaceuticals market is over $900 billion and that biological therapeutics represent approximately $150 billion of this market. While genetically modified salmon or trout may be considered new products, the global market for aquaculture is valued at approximately $144 billion. Genetically modified agricultural plants are already grown on more than 180 million hectares around the world and are worth an estimated $15 billion. In energy, we are working to create novel, highly engineered organisms that use specific feedstocks to create commercially valuable end products, such as isobutanol, which already has a variety of technical and industrial applications and is also being investigated as a gasoline alternative.

We believe our technologies are broadly applicable across many diverse end markets, including some end markets that have failed to recognize the applicability of synthetic biology or failed to efficiently utilize biologically based processes to produce products. Our business model entails the formation of ECCs with collaborators that have expertise within specific industry sectors. In our ECCs, we provide expertise in the engineering, fabrication and modification of gene programs and cellular systems, and our collaborators are responsible for providing commercial market and product development expertise, as well as sales and marketing capabilities. Generally, our collaborators compensate us through technology access fees, royalties, milestones and reimbursements of certain costs. This business model allows us to leverage our capabilities and capital across a

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broader landscape of product opportunities and end markets than we would be capable of addressing on our own. Alternatively, we may execute a research collaboration to develop an early-stage program pursuant to which we receive reimbursement for our development costs but the grant of exclusive commercial rights, and payment of the related access fee, are deferred until completion of an initial research program.

In certain strategic circumstances, we may enter into a joint venture with a third party collaborator whereby we may contribute access to our technology, cash or both into the joint venture which we will jointly control with our ECC collaborator. We may be required to contribute additional capital to the joint venture, and we may be able to receive a higher financial return than we would normally receive from an ECC to the extent that we and our collaborator are successful in developing one or more products.

What is synthetic biology?

History

Synthetic biology entails the application of engineering principles to biological systems for the purpose of designing and constructing new biological systems or redesigning/modifying existing biological systems. Biological systems are governed by DNA, the building blocks of gene programs, which control cellular processes by coding for the production of proteins and other molecules that have a functional purpose and by regulating the activities of these molecules. This regulation occurs via complex biochemical and cellular reactions working through intricate cell signaling pathways, and control over these molecules modifies the output of biological systems.

In the early 1970s, scientists utilized basic tools and procedures for transferring DNA from one organism to another. Foundational tools included: gene programs contained in vectors; enzymes that could cut DNA at specific sites; and enzymes that could "glue" two complementary segments of DNA together. Developments between 1980 and the end of the 20th century advanced the field of genetic engineering, including automated DNA sequencing, DNA amplification via PCR and the creation of genetically modified organisms. However, the simplistic "cut-and-paste" nature of the available tools, and the absence of genomic sequence information, significantly restricted the scope of early synthetic biology efforts.

More recently, synthetic biology has been enabled by the application of information technology and advanced statistical analysis, also known as bioinformatics, to genetic engineering, as well as by improvements in DNA synthesis. Synthetic biology aims to engineer gene-based programs or codes to modify cellular function to achieve a desired biological outcome. For example, applications may include the replacement of a defective protein with a functional protein to treat a broad range of human and animal disease states, or the production of multiple proteins through the regulation of several genes in a cell to produce petrochemicals.

Our approach

The essence of our approach is to apply synthetic biology by using an iterative process that is rapid, automated and highly reproducible, in which we:

- Design genes of interest and gene programs utilizing knowledge of cellular pathways and protein function;
- Build biological molecules, gene programs and their variants to optimize performance of the biological system;
- Test gene programs by inserting them into cellular systems and comparing the result(s) to the intended effects; and
- Learn by utilizing information gained in our iterative processes to create better gene programs and cellular systems using a more informed and efficient process to achieve improved outcomes.

As a result of our approach, we have developed extensive knowledge about many classes of DNA components and the rules governing their expression and activity. We have also assembled an inventory of these DNA components that we can use to rationally construct unique vectors rapidly and with predictable outcomes. The knowledge embedded in our DNA database allows us to create single gene and highly complex multigenic gene programs (an individual gene program containing multiple genes).

To support our approach, we have developed, acquired, and integrated a unique suite of technologies, and we continue to expand upon their capabilities. These technologies include: our UltraVector gene design and fabrication platform, and its associated library of modular DNA components; Cell Systems Informatics; RheoSwitch inducible gene switch; AttSite

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Recombinases; Protein Engineering; Laser-Enabled Analysis and Processing, or LEAP; and ActoBiotics platform. These technologies are complementary in nature and share the following key characteristics:

- Platform neutral — outcome oriented. We can work across different cell types with the objective of achieving the intended biological outcome allowing for product development across a broad spectrum of end markets.
- Knowledge driven. We use statistical modeling tools and computational analysis to continually acquire more knowledge about biological systems and their design to continually improve our ability to develop new and improved products and processes for our collaborators.
- Rationally designed. Our knowledge of biological systems and components allows us to design, build and select gene programs and predict the probable outcome of these programs.
- Capable of complexity. Our technologies enable the design and precise control of complex biological molecules and multigenic gene programs.
- Industrial scale. We use engineering principles and automation to enable products based on synthetic biology that are commercially viable.

Our competitive strengths

We believe that our technologies, our ability to work across multiple host systems and our approach to synthetic biology — design-build-test-learn — give us a competitive advantage over traditional industrial processes as well as current approaches to synthetic biology.

We believe that we have the following competitive strengths:

We have a suite of proprietary and complementary technologies

We have built a suite of proprietary and complementary technologies that provides us with a comprehensive ability to design, create, modify and regulate gene programs and cellular systems across multiple host systems (human, animal, insect, plant, fungi, and bacteria). By virtue of the complementary nature of our technologies, we are able to provide our collaborators with a diverse array of capabilities, representing a "one stop shop" to potentially develop and commercialize new and differentiated products enabled by synthetic biology.

Our design-build-test-learn continuum allows us to design and build improved and more complex gene programs

We have developed a core expertise and technologies to design, build and test complex gene programs, as well as technologies to isolate cells that best express the desired biological output. We have also developed an extensive bioinformatic software platform that combines information technology with advanced statistical analysis for DNA design and genetic engineering, enabling us to continually learn and create optimal conditions for our gene programs. Our approach allows us to build improved and more complex gene programs.

We believe we are a leader in synthetic biology

We believe we are the first company focused exclusively on applying synthetic biology across a broad spectrum of end markets and have been working in the field since 1998. Over the last 18 years, we have accumulated extensive knowledge and experience in the design, modification and regulation of gene programs. We believe all of these factors, coupled with our suite of proprietary and complementary technologies, provide us with a first-mover advantage in synthetic biology.

We serve large and diverse end markets with high built-in demand

A vast number of products consumed globally are or can be produced using biologically-based processes. Natural resources are becoming more scarce as demand exceeds supply, creating unmet needs for improvements in development and manufacturing. As a result, the need for complex biologically engineered molecules such as those enabled by our synthetic biology technologies is large and spans multiple industries, including health, food, energy, environment, and consumer. Each of these markets faces unique challenges, however all have unmet needs for improvements in product development and manufacturing that can result in savings of both cost and time as compared to traditional means of industrial design and production. Because synthetic biology has the potential to deliver against these unmet needs, we believe that significant demand already exists for

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improved products enabled by synthetic biology. Additionally, there are markets utilizing traditional industrial processes that have failed to recognize the significant improvement in performance that could be achieved using synthetic biology.

We have a scalable ECC business model that allows us to leverage the broad potential of synthetic biology

We believe our ECC business model is a capital efficient and rapid way for us to participate in a more diversified range of product opportunities and industrial end markets than would otherwise be possible, including health, food, energy, environment, and consumer. Our collaborators are primarily responsible for providing market and product development expertise, as well as sales and marketing capabilities. Generally, our collaborators compensate us through technology access fees, royalties, milestones and reimbursements of certain costs. Our ECC business model allows us to participate in the potential upside from products that are enabled by our technologies across an extensive range of industries, without the need for us to invest considerable resources in bringing individual programs to market. Moreover, we believe that we will increasingly engage in ECCs in new fields at an accelerating pace with well-recognized collaborators.

We have experienced management and employees

Our management team, including our Chief Executive Officer, Randal J. Kirk, and our Chief Operating Officer, Krish S. Krishnan, consists of executives with a track record of success in building and managing research and development-driven companies, including New River Pharmaceuticals Inc., which was sold in 2007 to Shire plc for $2.6 billion. Our Chief Science Officer, Thomas D. Reed, was responsible for the initial conception and creation of our UltraVector technology platform. As of December 31, 2015, we had 312 research and development employees.

Our suite of proprietary and complementary technologies

We apply the potential of synthetic biology through our suite of proprietary and complementary technologies that combine the principles of precision engineering, statistical modeling, automation and production at an industrial scale. This enables us to engineer precise and complex gene programs across many cell types rapidly and inexpensively. These technologies include: our UltraVector gene design and fabrication platform, and its associated library of modular DNA components; RheoSwitch inducible gene switch; Cell Systems Informatics; AttSite Recombinases; Protein Engineering; antibody discovery; LEAP processing; and ActoBiotics platform.

In order to create a highly functional biological system, we recognize the complexity of cellular processes and the necessity to construct an optimized gene program in conditions reflective of the natural environment to allow for the creation of the optimal biological product. This requires a rigorous understanding of cell signaling pathways as well as the interactions that influence the expression of protein. This knowledge is captured in our advanced Cell Systems Informatics, which uses statistical modeling and other analytic frameworks to determine the most efficient pathways for an intended biochemical result, and also plays a critical role in our research and development as this database of information allows us to explore new targets of potential interest to our current or future collaborators. Moreover, our bioinformatics and computational modeling platform is central to our Protein Engineering, which focuses on designing enhanced and/or novel protein functionalities, including stability, localization, and catalytic activity.

In addition to creating optimized gene programs via the most efficient cell signaling pathways and in the relevant cellular environments, we have a growing library of genetic components with our UltraVector platform that enable design and assembly of gene programs which facilitate control over the quality, function, and performance of living cells. Our RheoSwitch inducible gene switch provides quantitative dose-proportionate regulation of the amount and timing of target protein generated, thereby providing another mechanism to closely control activity of a newly constructed gene program. Further, our AttSite Recombinases allow for stable, targeted gene integration and expression. Once cells have been engineered for the desired biological output, the LEAP automated platform can be used to identify and purify cells of interest, such as antibody expressing cells and stem cells. Furthermore, our ActoBiotics platform allows for targeted in situ expression of proteins and peptides from engineered microbes.

Our technology platform is designed to provide a "one stop shop" for start-to-finish conceptualization, engineering, regulation, optimization and production of biologically-based solutions that we believe possess many advantages over traditional processes. Our leading-edge toolkit can empower many different cell platforms allowing for selection of the most effective host to create a desired product or solution for our partners.

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Our markets

Synthetic biology has applicability across many diverse end markets. Our goal is to be a leader in the application of synthetic biology for products currently utilizing biologically based processes, and a leader in the replacement of conventional processes and products with biologically based substitutes. Through the application of our suite of proprietary and complementary technologies, we believe we can create optimized biological processes and create substitutes for traditional industrial techniques, leading to improved products that are developed and manufactured faster and more cost-effectively.

Health Sector

It is estimated that the global human pharmaceuticals market is approximately $900 billion and that biological therapeutics represent approximately $150 billion of this market. Additionally, the market for animal health therapeutics is currently estimated to be valued at more than $20 billion globally. The unreliable, costly discovery and development process for new medicines is being replaced by the engineering of biology at the genetic, molecular, and cellular level. Our ability to regulate complex gene programs and cellular systems by applying the principles of science, engineering, and computational bioinformatics with proprietary technologies is being utilized to design new therapies for humans and animals. We are applying our approach to develop targeted gene therapy applications and novel solutions within oncology, rare skin disorders, active pharmaceutical ingredients, ocular diseases, human infertility, infectious diseases, and animal health, as well as autoimmune, metabolic, and gastrointestinal disorders.

Food Sector

The Food and Agriculture Organization (FAO) of the United Nations, predicts that by 2050 the world's population will exceed 9 billion, global demand for animal protein will more than double, food production will need to increase by 70 percent, and global consumption of dairy and beef products will increase by 158 percent above present levels of $352 billion. We are focused on enabling efficient, high-quality food production that sustainably supports the necessities of our growing population. By applying our suite of technologies, we aim to facilitate development of agricultural, livestock and aquaculture resources that deliver innovative approaches and superior production yields in an environmentally responsible manner.

Energy Sector

Biological approaches hold significant potential to efficiently yield energy products. Despite this, existing attempts to produce "clean" energy are incredibly expensive, not achievable at an industrial scale, or require massive resources with low productivity. Additionally many alternative energy initiatives use food sources, like corn and sugarcane, which compete for arable land and water with sustenance crops. With our unique cellular engineering capabilities, we are developing microbial cell lines for bioconversion of methane to higher carbon content compounds. This proprietary platform holds the potential to transform the gas-to-liquids industry by generating valuable fuels and chemicals at a fraction of the cost of more traditional conversion methods. Our bioconversion approach seeks to attain the optimal balance of sustainable productive yield and attractive economic returns.

Environment Sector

As a result of industrialization and rapidly growing global populations, chemicals, heavy metals, oil products and various other pollutants are pervasive in the environment. These pollutants result in poor quality of drinking water, loss of water supply, contaminated ground water and soil, high clean-up costs, and potential health problems. We seek to engineer biological solutions that are designed to preserve the environment and either reduce the use of resources that are being rapidly depleted, like water and wood, or in some cases to even replenish them. These biological approaches may replace products that present an environmental hazard. Examples include microbial-based strategies to pest and rodent control with minimal impact on non-target species and solutions that can enhance the healthy growth of planned forests, reducing the burden on our world's shrinking natural forests.

Consumer Sector

Global consulting firm A.T. Kearney estimates consumer spending will grow to $40 trillion by 2020 including an increase in spending on durable goods and personal care items. Despite its size and the number of products that can be achieved through biological means, the consumer market has experienced limited impact from synthetic biology. We are committed to partnering with diverse companies to develop bio-based processes that displace petroleum-derived ingredients and polymers. Additionally, we are focused on reducing the wasteful practices associated with extracting

compounds that occur in limiting amounts in

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plants and animals. Through our synthetic biology capabilities, we plan to utilize innovative biologically based applications for the development of products, such as personal care items and decorative arts, to improve the lives of consumers every day.

Our business model

We believe that because synthetic biology has applicability across many diverse end markets, we cannot take full advantage of synthetic biology with internal development programs alone. To address this, we have devised our business model to allow us to focus on our core expertise in synthetic biology while bringing many different commercial products to market via collaborations in a broad range of industries or end markets, thus minimizing and leveraging the use of our own capital.

Our business model is built primarily around the formation of ECCs. An ECC is an agreement with a collaborator to develop products based on our technologies in a specifically defined field. We seek collaborators that have expertise within a specific industry sector and the commitment to provide resources for the commercialization of products within that industry sector. In our ECCs, we provide expertise in the engineering of gene programs and cellular systems, and our collaborators are responsible for providing market and product development expertise, as well as sales and marketing capabilities.

This business model allows us to leverage our capabilities and capital across numerous product development programs and a broader landscape of end markets than we would be capable of addressing on our own. Our ECC business model also allows us to participate in the potential upside from products that are enabled by our technologies across an extensive range of industries, without the need for us to invest considerable resources in bringing individual products to market. Additionally, the flexibility of the business model allows us to collaborate with a range of counterparts, from small innovative companies to global multinational conglomerates.

Alternatively, we may execute a research collaboration to develop an early-stage program pursuant to which we receive reimbursement for our development costs but the exclusive commercial rights, and related access fees, are deferred until completion of an initial research program.

In certain strategic circumstances, we may enter into a joint venture with a third party collaborator whereby we may contribute access to our technology, cash or both into the joint venture which we will jointly control with our collaborator. Pursuant to a joint venture agreement, we may be required to contribute additional capital to the joint venture, and we may be able to receive a higher financial return than we would normally receive from an ECC to the extent that we and our collaborator are successful in developing one or more products.

As we consider the broad potential applications of our synthetic biology technologies, we have identified a number of ventures that are already enabling products that benefit from the application of such technology. We believe that the strategic acquisition of certain such companies will allow us to develop and commercialize innovative products and create significant value for Intrexon. Our business model therefore includes the acquisition of certain product-focused companies that may leverage our technologies and expertise in order to expand their respective product applications.

As a means to further the development of our business model, in June 2015, we entered into an agreement with Harvest Intrexon Enterprise Fund I LP, or Harvest, an investment fund sponsored by Harvest Capital Strategies, LLC, and a related party based on ownership in the fund by affiliates of Third Security, LLC, or Third Security. Harvest was established to invest in life science research and development opportunities that we offer to Harvest. These will be investment proposals that are suitable for pursuit by a start-up venture, characterized by the agreement as "start-up opportunities." For such start-up opportunities, we will provide Harvest with exclusive rights of first-look and first negotiation. For any opportunities it decides to pursue, Harvest would establish new collaboration entities which would enter into an ECC with us in a designated field. The terms of such ECCs would be negotiated between us and Harvest. In addition, the agreement provides us the right to present to Harvest the opportunity to invest in other ventures, including investment opportunities with respect to our existing collaborations. Any such opportunities would be presented at our discretion on a non-exclusive basis. The agreement with Harvest does not limit our ability to execute other collaborations and joint ventures with third parties. As consideration for providing exclusive rights of first-look and first negotiation for start-up opportunities, we receive a portion of the management fee collected by the fund sponsor of Harvest.

Our ECCs

Our ECCs typically share a number of key features. Each ECC is an agreement with a collaborator to develop products based on our technologies in one or more specifically defined fields. These fields may be narrowly defined (representing, for example, a specific therapeutic approach for a single indication) or may be broad (representing, for example, an entire class of related products). In each case, we and the collaborator precisely define the field based on factors such as the expertise of the

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collaborator, the relative markets for the prospective products, the collaborator's resources available to commit to the ECC and our expectations as to other prospective ECCs in related areas. Regardless of the size of the field, under each ECC we grant the collaborator exclusive rights to our services and our suite of technologies to commercialize products within the field. So long as our collaboration continues, the parties agree that each will not, alone or with another party, develop and commercialize products within the field of the ECC.

We realize four general categories of revenue under our ECCs: (i) technology access fees upon signing; (ii) reimbursements of costs incurred by us for our research and development and/or manufacturing efforts related to specific applications provided for in the collaboration; (iii) milestone payments upon the achievement of specified development, regulatory and commercial activities; and (iv) royalties on sales of products arising from the collaboration.

Pursuant to our business model, we may receive equity in lieu of cash for technology access fees and milestones and also may participate in capital raises to allow earlier-stage collaborators to focus their resources on product development. However, when such a collaborator develops greater operational or financial resources, its shares become a financial asset within Intrexon that is independent of our operational or collaborative purposes. In June 2015, we provided our shareholders the opportunity to participate directly in the value generated by our ECC with ZIOPHARM Oncology, Inc., or ZIOPHARM, by distributing all of our shares in ZIOPHARM to our shareholders as a special stock dividend.

Generally, each of our ECCs is designed to continue in perpetuity unless terminated. Given the relatively long development cycle for many of the products that could be enabled by our technologies, as well as our belief that we can enable the continual improvement of product offerings, it is our expectation that our ECCs will continue for many years and result in the development of multiple products. Each of our collaborators, however, retains the right to terminate the ECC for any reason by providing us written notice a certain period of time prior to such termination, generally ninety days. The ECC is also terminable by either party upon the other party's breach of material provisions of the ECC. The failure of our collaborator to exercise diligent efforts to develop products within the field of the ECC constitutes such a breach.

In the event one of our ECCs terminates, we are entitled to immediately pursue another collaboration within the field of the terminated ECC. Moreover, technologies and product candidates in a relatively early stage of development revert to us, along with data, materials and the rights to applicable regulatory filings related to the reverted products, enabling us to develop those products ourselves or incorporate them into a future collaboration. Product candidates that are at a more advanced stage of development, such as those already generating revenue or being considered for approval by the applicable regulatory body, for example, at the time of the ECC's termination are retained by the former collaborator. The collaborator has the right to commercialize such retained products although we are entitled to the royalties or other compensation to which we would be entitled as if the ECC were still in effect. Upon termination, we generally retain any technology access fees or other payments to which we are entitled through the date of termination.

In our ECCs, we retain rights to our existing intellectual property and generally any intellectual property developed using, or otherwise incorporating, our technologies. In addition, we are generally responsible for controlling the prosecution and enforcement of this intellectual property with the exception of the enforcement of patents directed solely and specifically to products developed within the field of each ECC.

Each of our ECCs requires the collaborator to indemnify us for all liability related to products produced pursuant to the ECC and to obtain insurance coverage related to product liability.

See Note 5 to our consolidated financial statements appearing elsewhere in this annual report on Form 10-K for a discussion of our significant ECCs.

Joint ventures

To date, all of our joint ventures, or JVs, have been formed for the purpose of entering into an ECC with us. The following represent our significant joint ventures as of December 31, 2015.

Intrexon Energy Partners II

In December 2015, we and certain investors, or the IEPII Investors, entered into a Limited Liability Company Agreement which governs the affairs and conduct of business of Intrexon Energy Partners II, LLC, or Intrexon Energy

Partners II, a joint venture formed to utilize our natural gas bioconversion platform for the production of 1,4-butanediol, an industrial chemical intermediate used to manufacture spandex, polyurethane, plastics, and polyester. We also entered into an ECC with Intrexon Energy Partners II providing exclusive rights to our technology for use in the field, as a result of which we received a

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technology access fee of $18 million while retaining a 50 percent membership interest in Intrexon Energy Partners II. The IEPII Investors made initial capital contributions, totaling $18 million in the aggregate, in exchange for pro rata membership interests in Intrexon Energy Partners II totaling 50 percent. In December 2015, the owners of Intrexon Energy Partners II made a capital contribution of $4 million, half of which was paid by us. We committed to make additional capital contributions of up to $10 million, and the IEPII Investors, as a group and pro rata in accordance with their respective membership interests in Intrexon Energy Partners II, have committed to make additional capital contributions of up to $10 million, at the request of the Intrexon Energy Partners II's board of managers, or the Intrexon Energy Partners II Board, and subject to certain limitations. Intrexon Energy Partners II is governed by the Intrexon Energy Partners II Board which has five members. One member of the Intrexon Energy Partners II Board is designated by us and four members are designated by a majority of the IEPII Investors. We and the IEPII Investors have the right, but not the obligation, to make additional capital contributions above the initial limits when and if solicited by the Intrexon Energy Partners II Board.

Intrexon Energy Partners

In March 2014, we and certain investors, or the IEP Investors, entered into a Limited Liability Company Agreement which governs the affairs and conduct of business of Intrexon Energy Partners, LLC, or Intrexon Energy Partners, a joint venture formed to optimize and scale-up our gas-to-liquid bioconversion platform for the production of certain fuels and lubricants. We also entered into an ECC with Intrexon Energy Partners providing exclusive rights to our technology for the use in bioconversion, as a result of which we received a technology access fee of $25 million while retaining a 50 percent membership interest in Intrexon Energy Partners. The IEP Investors made initial capital contributions, totaling $25 million in the aggregate, in exchange for pro rata membership interests in Intrexon Energy Partners totaling 50 percent. We committed to make additional capital contributions of up to $25 million, and the IEP Investors, as a group and pro rata in accordance with their respective membership interests in Intrexon Energy Partners, have committed to make additional capital contributions of up to $25 million, at the request of the Intrexon Energy Partners' board of managers, or the Intrexon Energy Partners Board, and subject to certain limitations. Intrexon Energy Partners is governed by the Intrexon Energy Partners Board which has five members. Two members of the Intrexon Energy Partners Board are designated by us and three members are designated by a majority of the IEP Investors. We and the IEP Investors have the right, but not the obligation, to make additional capital contributions above the initial limits when and if solicited by the Intrexon Energy Partners Board.

Contemporaneously with the formation of the joint venture and entry into the ECC, we entered into securities purchase agreements with the IEP Investors for the private placement of 972,004 shares of our common stock for gross proceeds of $25 million.

OvaXon

In December 2013, we entered into an ECC with OvaScience, Inc., or OvaScience, a life sciences company focused on the discovery, development and commercialization of new treatments for infertility. Additionally, we and OvaScience formed OvaXon, LLC, or OvaXon, a joint venture to create new applications for improving human and animal health. Both we and OvaScience made an initial capital contribution of $1.5 million in January 2014 for a 50 percent membership interest in OvaXon. OvaXon is governed by the OvaXon board of managers, or the OvaXon Board, which has four members, two each from us and OvaScience. In cases in which the OvaXon Board determines that additional capital contributions are necessary in order for OvaXon to conduct business and comply with its obligations, each of us and OvaScience have the right, but not the obligation, to make additional capital contributions to OvaXon subject to the terms of the agreement. OvaScience also licensed certain technology relating to egg precursor cells to OvaXon pursuant to a separate license agreement.

S & I Ophthalmic

In September 2013, we entered into a Limited Liability Company Agreement, or the Sun LLC Agreement, with Caraco Pharmaceutical Laboratories, Ltd., or Sun Pharmaceutical Subsidiary, an indirect subsidiary of Sun Pharmaceutical Industries Ltd., or Sun Pharmaceutical, an international specialty pharmaceutical company focused on chronic diseases, to form S & I Ophthalmic, LLC, or S & I Ophthalmic. The Sun LLC Agreement governs the affairs and the conduct of business of S & I Ophthalmic. S & I Ophthalmic leverages experience and technology from both us and Sun Pharmaceutical. Both we and Sun Pharmaceutical Subsidiary made an initial capital contribution of $5

million in October 2013 for a 50 percent membership interest in the joint venture. S & I Ophthalmic is governed by the S & I Ophthalmic board of managers, or the S & I Ophthalmic Board, which has four members, two each from us and Sun Pharmaceutical Subsidiary. In cases in which the S & I Ophthalmic Board determines that additional capital contributions are necessary in order for the joint venture to conduct business and comply with its obligations, each of us and Sun Pharmaceutical Subsidiary have committed to making additional capital contributions to S & I Ophthalmic, subject to certain limits defined in the agreement. Each has the right, but not the

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obligation, to make additional capital contributions above the defined limits when and if solicited by the S & I Ophthalmic Board.

Beginning on the seventh anniversary of the effective date of the Sun LLC Agreement, and upon the second anniversary thereafter, we, as well as Sun Pharmaceutical Subsidiary, may make a cash offer to purchase all of the other party's interest in S & I Ophthalmic. Upon receipt of such an offer, the other party must either agree to tender its interests at the offered price or submit a counteroffer at a price higher than the original offer. Such offer and counteroffer may continue until one party agrees to the other's price.

See Note 5 to our consolidated financial statements appearing elsewhere in this annual report on Form 10-K for a discussion of significant ECCs between us and our joint ventures.

Primary operating subsidiaries

Primary wholly owned operating subsidiaries

Trans Ova Genetics, L.C.

Trans Ova Genetics, L.C., or Trans Ova, is internationally recognized as a provider of industry-leading bovine reproductive technologies. Intrexon and Trans Ova intend to build upon Trans Ova's current platform with new capabilities with a goal of achieving higher levels of delivered value to dairy and beef cattle producers. ViaGen, L.C., or ViaGen, a wholly owned subsidiary of Trans Ova, is a provider of cloning technology for non-primate species. Exemplar Genetics, LLC, or Exemplar, a wholly owned subsidiary through the combined ownership of Trans Ova, ViaGen and us, is a company committed to enabling the study of life-threatening human diseases.

Okanagan Specialty Fruits, Inc.

Okanagan Specialty Fruits, Inc. and its affiliates, or Okanagan, is the pioneering agricultural company behind the world's first non-browning apple without the use of any flavor altering chemical or antioxidant additives. Okanagan is developing new commercial tree fruit varieties intended to provide benefits to the entire supply chain, from growers to consumers.

Oxitec Limited

Oxitec Limited, or Oxitec, is a pioneering company in biological insect control solutions. Oxitec is developing products that use genetic engineering to control insect pests that spread disease and damage crops. Using advanced genetics and molecular biology, Oxitec has developed a new and innovative solution to controlling Aedes aegypti, a mosquito that is a known vector for the transmission of infectious disease including dengue fever, chikungunya, and Zika virus. To date, Oxitec has received approvals to conduct open field trials of its self-limiting insect technologies in a number of jurisdictions and has completed trials in Brazil, Panama, the Cayman Islands and Malaysia.

Primary majority-owned operating subsidiary

AquaBounty Technologies, Inc.

AquaBounty Technologies, Inc., or AquaBounty, of which we own approximately 63 percent as of December 31, 2015, is focusing on improving productivity in commercial aquaculture, including the development of the AquAdvantage® Salmon, or AAS, an Atlantic salmon that has been genetically enhanced to reach market size in less time than conventionally farmed Atlantic salmon. In November 2015, the Food and Drug Administration, or FDA, approved the New Animal Drug Application for AAS.

Mergers, acquisitions, and technology in-licensing

We may augment our suite of proprietary technologies through mergers or acquisitions of technologies which then become available to new or existing collaborators. Among other things, these technologies are generally complementary to our existing technologies and also meet our desired return on investment and other economic criteria. In certain cases, such technologies may already be applied in the production of products or services and in these cases we may seek to expand the breadth or efficacy of such products or services through the use of our technologies. The following represent our significant mergers, acquisitions, and technology in-licensing in 2015. For a more detailed discussion of these transactions, see also "Notes to Consolidated Financial Statements" appearing elsewhere in this annual report on Form 10-K.

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Oxitec acquisition

In September 2015, we acquired 100 percent of Oxitec. The aggregated consideration paid consisted of (i) 1,359,343 shares of our common stock, or the Stock Consideration, and (ii) $90.2 million in cash, or the Cash Consideration, inclusive of net cash and working capital adjustments, as defined in the agreement, totaling $9.4 million. Stock Consideration of 480,422 of the shares and Cash Consideration totaling $2.0 million were withheld as escrow at closing and are issuable and payable, respectively, eighteen months after closing, subject to reduction for satisfaction of any claims for indemnification made by us under the agreement. We began consolidating Oxitec's results of operations and financial position beginning in September 2015.

Okanagan acquisition

In April 2015, we acquired 100 percent of Okanagan for $10.0 million in cash and 707,853 shares of our common stock. In addition to supporting Okanagan's further development and commercialization of its apple products, we expect to utilize our proprietary technologies to assist Okanagan in the development of further novel beneficial plant traits. We began consolidating Okanagan's results of operations and financial position beginning in April 2015.

ActoGeniX acquisition

In February 2015, we acquired 100 percent of ActoGeniX NV, or ActoGeniX, a European biopharmaceutical company, for $32.7 million in cash and 965,377 shares of our common stock. ActoGeniX's platform technology complements our suite of proprietary technologies available for current and future collaborations. We began consolidating ActoGeniX's results of operations and financial position beginning in February 2015.

MD Anderson Cancer Center license

In January 2015, we and ZIOPHARM jointly entered into a license agreement with the University of Texas System Board of Regents on behalf of the University of Texas MD Anderson Cancer Center, or MD Anderson, whereby we received an exclusive license to certain research and development technologies owned and licensed by MD Anderson, including technologies relating to novel chimeric antigen receptor (CAR) T-cell therapies, as well as co-licenses and non-exclusive licenses to certain other related technologies. ZIOPHARM also received access to these technologies pursuant to the terms of our ECC with ZIOPHARM. We issued 2,100,085 shares of our common stock valued at $59.6 million to MD Anderson as consideration. Subject to certain exceptions, the license agreement expires on the last to occur of (i) the expiration of all patents licensed thereunder, or (ii) the twentieth anniversary of the date of the license agreement.

Exemplar acquisition

In August 2014, we acquired 100 percent of the membership interests of Trans Ova. Trans Ova, directly and through its wholly owned subsidiary, controlled approximately 51 percent of the outstanding capital stock of Exemplar, a company committed to enabling the study of life-threatening human diseases. In February 2015, we acquired all of the minority-held equity interests of Exemplar for aggregate consideration consisting of 307,074 shares of our common stock. We began consolidating Exemplar's results of operations and financial position beginning in August 2014.

Competition

We believe that we are a leader in synthetic biology. We do not believe that we have any direct competitors who provide similar technologies which fully enable the commercialization of products developed using synthetic biology across a broad spectrum of biologically based industries. As a result, we believe our competition is more indirect and general in nature, and falls into three broad categories:

- Synthetic biology service providers. There are companies that have competing technologies for individual pieces of our suite of complementary technologies. For example, there are companies that can synthesize DNA, and there are companies that can develop monoclonal antibodies. One portion of our proprietary technology related to DNA synthesis and assembly includes the ability to de novo synthesize DNA. We believe the following companies engage in the manufacture of DNA componentry: DNA 2.0, Inc., Blue Heron Biotech, LLC (a subsidiary of OriGene) and Life Technologies Corporation, now part of Thermo Fisher Scientific Inc.
- Industrial companies who may develop their own approach to synthetic biology. Rather than becoming a collaborator with us, potential collaborators may decide to invest time and capital to internally develop their own

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synthetic biology capabilities. For example, large biopharmaceutical companies, energy companies, and ag-bio companies may pursue a proprietary synthetic biology strategy.

- Industrial companies who may develop competing products using other technologies. Products enabled by our synthetic biology will face competition in the market, including from products which have been developed using other industrial technologies. For example, large biopharmaceutical companies pursue other technologies for drug development, and large ag-bio companies pursue other technologies for the development of genetically modified crops. The rapidly evolving market for developing genetically engineered T-cells in particular, a primary focus of our collaboration with ZIOPHARM, is characterized by intense competition and rapid innovation. Genetically engineering T-cells faces significant competition in the chimeric antigen receptor (CAR) technology space from multiple companies and their collaborators, such as Novartis/University of Pennsylvania, Bluebird Bio/Celgene/Baylor College of Medicine, Kite Pharma/National Cancer Institute, Juno Therapeutics/Fred Hutchinson Cancer Research Center/Memorial Sloan-Kettering Cancer Center/Seattle Children's Research Institute, Cellectis/Pfizer and Adaptimmune/GSK. We face competition from non-cell based treatments offered by other companies such as Amgen, AstraZeneca, Bristol-Myers, Incyte, Merck, and Roche.

Intellectual property

As we advance technologies across multiple platforms and synthetic biology areas, correspondingly, we apply a multilayered approach for protecting intellectual property relating to the inventions we have developed internally as well as those we have acquired from third parties, such as by assignment or by in-license. We seek patent protection in the United States and in other countries for our inventions and discoveries, and we develop and protect our key know-how and trade secrets relating to our platform technologies as well as to the products we are developing with our collaborators.

We seek patent protection for our platform technologies, including but not limited to our (i) switch technology; (ii) activator ligands for our switch technology; (iii) portfolio around various genetic componentry such as vectors, cells and organisms containing these genetic componentry; and (iv) cell identification and selection platform. In addition, we seek patents covering specific collaborator's products. With respect to a particular collaborator's product, we may seek patent protection on some or all of the following aspects of the invention such as: the compound or material composition of matter and/or the method or process of making or using the composition.

Through the use of our various platform technologies we seek to design and build proprietary compounds, vectors, methods and processes across a variety of end markets. In particular, we focus our intellectual property on synthetic biology technologies that provide platforms for the design and creation of cells, vectors and components for our collaborators. In addition, we may pursue intermediate and product-specific patents associated with our collaborators' lead programs.

Our success depends, in part, upon our ability to obtain patents and maintain adequate protection for our intellectual property relating to our technologies and products and potential products. We have adopted a strategy of seeking patent protection in the United States and in other jurisdictions globally as we deem appropriate under the circumstances, with respect to certain of the technologies used in or relating to our products and processes. For instance, where we believe appropriate, we have also filed counterpart patents and patent applications in other countries, including Australia, Argentina, Brazil, Canada, China, Europe, Hong Kong, India, Indonesia, Israel, Japan, Korea, Mexico, New Zealand, Philippines, Russia, Singapore, South Africa and Taiwan. In the future we may file in these or additional jurisdictions as deemed appropriate for the protection of our technologies.

As of December 31, 2015, we owned at least 55 issued U.S. patents and 55 pending U.S. patent applications relating to certain aspects of our technologies, and we have pursued counterpart patents and patent applications in other jurisdictions around the world, as we have deemed appropriate. We continue to actively develop our portfolio through the filing of new patent applications, provisional and continuations or divisionals relating to our technologies, methods and products as we and our collaborators deem appropriate.

We have strategic positioning with respect to our key technologies including our owned patent portfolios directed to: our switch technology covering aspects of our switches and gene modulation systems, with a last to expire patent currently in 2029; our portfolio around various genetic componentry, such as vectors, cells and organisms containing these genetic componentry, and their use, with a last to expire patent in 2032; our activator ligand technology covering

aspects of our activator ligands and their use, with a last to expire patent in 2034; and our cell identification and selection technology covering aspects of our cell identification and selection platform, including our cell purification, isolation, characterization and manipulation technologies, with a last to expire patent in 2031. Although we cannot be assured that these patents may not be subject to challenge in the

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future, as of this filing, there are currently no material contested proceedings and/or third party claims with respect to any of these patent portfolios.

Additionally, we complement our intellectual property portfolio with exclusive and non-exclusive patent licenses and options for licenses to third party technologies.

A principal component of our strategy is maximizing the value of our ECCs through our intellectual property that covers our technologies, which is accentuated by intermediate and program-specific intellectual property protections. In addition to owned and in-licensed patents, we solidify our intellectual property protection through a combination of trade secrets, know-how, confidentiality, nondisclosure and other contractual provisions, and security measures to protect our confidential and proprietary information related to each platform and collaborator program. We regularly assess and review the risks and benefits of protecting our developments through each aspect of intellectual property available to us.

Because we rely on trade secrets, know-how and continuing technological advances to protect various aspects of our core technology, we require our employees, consultants and scientific collaborators to execute confidentiality and invention assignment agreements with us to maintain the confidentiality of our trade secrets and proprietary information. Our confidentiality agreements generally provide that the employee, consultant or scientific collaborator will not disclose our confidential information to third parties. These agreements also provide that inventions conceived by the employee, consultant or scientific collaborator in the course of working for us will be our exclusive property. Additionally, our employees agree to take certain steps to facilitate our assertion of ownership over such intellectual property. These measures may not adequately protect our trade secrets or other proprietary information. If they do not adequately protect our rights, third parties could use our technologies, and we could lose any competitive advantage we may have. In addition, others may independently develop similar proprietary information or techniques or otherwise gain access to our trade secrets, which could impair any competitive advantage we may have.

Regulatory environment

Regulations affecting Intrexon

Our ongoing research and development relies on evaluations in animals, which may become subject to bans or additional regulations. As described below, our research operations are also subject to various environmental regulations. However, while most of the current laws and regulations concerning synthetic biology relate to the end products produced using synthetic biology, this may change. For example, in December 2010, the Presidential Commission for the Study of Bioethical Issues recommended that the federal government oversee, but not regulate, synthetic biology research. The Presidential Commission also recommended that the federal government lead an ongoing review of developments in the synthetic biology field and that the federal government conduct a reasonable risk assessment before the field release of synthetic organisms.

As discussed below, the products our collaborators produce are subject to extensive regulation. Refer to "Risk factors — The markets in which our collaborators are developing products using our technologies are subject to extensive regulation, and we rely on our collaborators to comply with all applicable laws and regulations" for more discussion of regulatory risks.

Environmental regulations affecting Intrexon, our subsidiaries and our collaborators

Our collaborators, our subsidiaries and we are subject to various federal, state and local environmental laws, rules and regulations, including those relating to the discharge of materials into the air, water and ground, the generation, storage, handling, use, transportation and disposal of hazardous materials and the health and safety of employees with respect to laboratory activities required for the development of products and technologies. These laws and regulations require us and our collaborators to obtain environmental permits and comply with numerous environmental restrictions. These laws and regulations also may require expensive pollution control equipment or operational changes to limit actual or potential impacts to the environment.

Our laboratory activities and those of our collaborators inherently involve the use of potentially hazardous materials, which are subject to health, safety and environmental regulations. We design our infrastructure, procedures and equipment to meet our obligations under these regulations. We perform recurring internal and third-party audits and provide employees ongoing training and support, as required. All of our employees must comply with safety instructions and procedures, which are codified in our employment policies. Federal and state laws and regulations

impose requirements on the production, importation, use and disposal of chemicals and genetically modified microorganisms, which impact us and our collaborators. Our subsidiaries' and our collaborators' processes may contain genetically engineered organisms which, when used in an industrial processes, are considered new chemicals under the Toxic Substances Control Act program of the U.S. Environmental Protection Agency, or EPA. These laws and regulations would require our subsidiaries and collaborators to obtain and comply with the EPA's

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Microbial Commercial Activity Notice process to operate. In the European Union, our subsidiaries and collaborators may be subject to a chemical regulatory program known as REACH (Registration, Evaluation, Authorization and Restriction of Chemical Substances). Under REACH, companies are required to register their products with the European Commission, and the registration process could result in significant costs or delay the manufacture or sale of products in the European Union.

Regulations affecting our collaborators and subsidiaries

Human therapeutics regulation

As discussed in "Risk factors — Risks associated with our business model," the products produced by our collaborators enabled by our technology platforms are subject to extensive regulation. We rely on our collaborators' compliance with laws and regulations applicable to the products they produce. We do not independently monitor whether our collaborators comply with applicable laws and regulations. Please see the risk factor entitled "The markets in which our collaborations are developing products using our technologies are subject to extensive regulation, and we rely on our collaborators to comply with all applicable laws and regulations."

Government authorities in the United States, at the federal, state and local level, and in other countries extensively regulate, among other things, the research, development, testing, manufacture, including any manufacturing changes, packaging, storage, recordkeeping, labeling, advertising, promotion, distribution, marketing, import and export of pharmaceutical products such as those being developed by our collaborators. The processes for obtaining regulatory approvals in the United States and in foreign countries, along with subsequent compliance with applicable statutes and regulations, require the expenditure of substantial time and financial resources.

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

Animal health regulation

The sale of animal health products is governed by the laws and regulations specific to each country. In the majority of our target markets, the relevant health authority is separate from those governing human medicinal products. In the United States, the FDA regulates animal health pharmaceuticals, the United States Department of Agriculture, or USDA, regulates veterinary vaccines, and EPA regulates veterinary pesticides. Each U.S. agency has its own rules and regulations with which our collaborators must comply. In Europe, the European Medicines Agency, or EMA, is responsible for the scientific evaluation of medicines, including animal health products being developed by our collaborators with our technology platforms. Most other countries' regulatory agencies will generally refer to the FDA, USDA, European Union and other international animal health entities.

Oxitec has produced a genetically engineered line of the mosquito Aedes aegypti (OX513A) with the intent of suppressing the population of that mosquito at the release site(s). Oxitec's genetically modified insect products are subject to regulation. The FDA's Center for Veterinary Medicine is currently reviewing information in an Investigational New Animal Drug, or INAD, file from Oxitec, regarding the company's genetically engineered mosquitoes. As part of the review, the FDA will publish for public comment a draft environmental assessment submitted by Oxitec that assesses the potential environmental impacts of conducting a field trial in Key Haven, Florida. The FDA is reviewing the draft environmental assessment along with other information on the Oxitec mosquito in consultation with government experts from other agencies, including the Centers for Disease Control and Prevention and EPA. The FDA will not complete its evaluation until it has thoroughly reviewed all the necessary information, including public comments on the draft environmental assessment. The FDA will issue public notification when it publishes the Oxitec draft environmental assessment for comment on www.regulations.gov. We do not currently have a timeline for when this action will occur. The OX513A genetically engineered mosquito has been approved by Brazil's National Biosafety Committee (CTNBio) for releases throughout the country, and open field trials of these mosquitoes have been conducted in Brazil, the Cayman Islands, Panama, and Malaysia. Further

approvals will be required for commercial production.

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Food product regulation

The manufacturing, marketing and certain areas of research related to some of the potential food products developed by our subsidiaries and collaborators are subject to regulation by federal and state governmental authorities in the United States, including the FDA, the USDA, and the EPA. The FDA regulates genetically engineered animals under new animal drug provisions of the law, and the agency must approve them before they are allowed on the market. Following marketing approval, the FDA continues to regulate drug and biological products extensively.

Okanagan's Arctic apple products are subject to such regulation. In February 2015, the USDA announced its decision to deregulate Okanagan's GD743 (Golden Delicious) apple variety and GS784 (Granny Smith) apple variety (together, "Arctic apples"). In reaching its decision, the USDA conducted a final plant pest risk assessment, or PPRA, concluding that Arctic apples are unlikely to pose a plant pest risk to agriculture and other plants in the United States. The USDA also completed an environmental assessment, or EA, to comply with the National Environment Policy Act, or NEPA, and concluded that deregulation is not likely to have a significant impact on the human environment. Concurrent with the USDA, Okanagan also engaged in a voluntary food safety assessment consultation with the FDA regarding its Arctic apples. The FDA completed its assessment in March 2015. Based on the information provided by Okanagan and other information available to the agency, the FDA did not identify any safety or regulatory issues under the Federal Food, Drug & Cosmetic Act that would require further evaluation. As part of bringing the assessment to closure, Okanagan was required to submit summaries of its safety and nutritional assessments for its Arctic apples.

Comparable authorities to the federal and state governmental authorities in the United States are involved in other countries, such as the EMA in Europe and Health Canada in Canada. In relation to Okanagan, Health Canada announced its decision in March 2015 that it has no objection to the food use of the Arctic apple in Canada. In reaching its decision, Health Canada conducted a comprehensive assessment of the GD743 (Golden Delicious) and GS784 (Granny Smith) varieties according to its Guidelines for the Safety Assessment of Novel Foods. These Guidelines are based upon internationally accepted principles for establishing the safety of foods with novel traits. Following this assessment, it was determined that the changes made to the Arctic apple did not pose a greater risk to human health than apples currently available on the Canadian market. In addition, Health Canada also concluded that the Arctic apple would have no impact on allergies, and that there are no differences in the nutritional value of the Arctic apple compared to other traditional apple varieties available for consumption.

AquaBounty's AAS is also subject to such regulation. The FDA published in December 2012 an EA for AAS along with its Finding of No Significant Impact, or FONSI, in the Federal Register, confirming that an approval of the pending New Animal Drug Application would not have an adverse effect on the environment and opened up a 60 day period for public comment. In February 2013, the FDA extended the period for public comment by an additional 60 days, which expired in April 2013. Prior to the publication of the EA and FONSI, in September 2010, the FDA held a public meeting of its Veterinary Medicine Advisory Committee to review its findings regarding AAS. The conclusion of its panel of experts was that AAS is indistinguishable from other farmed Atlantic salmon, is safe to eat and does not pose a threat to the environment under its conditions of use. Subsequently, the FDA initiated an EA in compliance with its obligations under the U.S. NEPA, which requires that all federal agencies consider the possible environmental impacts of any action that they authorize. Subsequently, in November 2015, the FDA approved the New Animal Drug Application for AAS. AquaBounty is subject to on-going post approval responsibilities as detailed in the FDA letter of approval and summarized in the EA dated in November 2015. In the event that AquaBounty seeks to modify or expand its production sites and methods, the company may require further regulatory approvals.

Energy and chemical regulation

Regulation by governmental authorities in the United States and other countries is a significant factor in the development, manufacture and marketing of biofuels. The biofuels developed by our collaborators with our technology platforms may require regulatory approval by governmental agencies prior to commercialization. In the United States, various federal, and, in some cases, state statutes and regulations also govern or impact the manufacturing, safety, storage and use of biofuels. The environmental regulations discussed above also govern the development, manufacture and marketing of energy and chemical products.

Research and development

As of December 31, 2015, we had 312 research and development employees. We incurred expenses of $147.5 million, $59.0 million and $48.1 million in 2015, 2014, and 2013, respectively, on research and development activities. We anticipate that our research and development expenditures will increase substantially as we investigate other applications for our synthetic biotechnologies. Our primary domestic research and development operations are located in laboratory facilities in

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Germantown, Maryland; South San Francisco, California; Davis, California; and San Diego, California; and our primary international research and development operations are located in laboratory facilities in Budapest, Hungary; Oxford, England; Ghent, Belgium; and Campinas, Brazil.

Financial Information

Collaboration revenues, product revenues, service revenues and other revenues and operating income for each of the last three fiscal years, along with assets at December 31, 2015 and 2014, are set forth in the consolidated financial statements, which are included in Item 8 of this Annual Report. Financial information about geographic areas is set forth in Note 2 to the consolidated financial statements.

Production

Our primary production facilities, including approximately 380 acres of land, are located in Sioux Center, Iowa. The land and facilities are primarily used for our embryo transfer and in vitro fertilization processes, as well as housing livestock used in such processes. We also lease regional production facilities and land in Maryland, Missouri, Oklahoma and Texas for these purposes.

Employees

As of December 31, 2015, we had 640 full-time and 94 part-time employees. We consider our employee relations to be good.

Corporate information

We are a Virginia corporation and our principal executive offices are located at 20374 Seneca Meadows Parkway, Germantown, MD 20876, and our telephone number is (301) 556-9900.

Additional Information

Our website is www.dna.com. The information on, or that can be accessed through, our website does not constitute part of this Form 10-K. We post regulatory filings on this website as soon as reasonably practicable after they are electronically filed with or furnished to the SEC. These filings include annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, Section 16 reports on Forms 3, 4, and 5, and any amendments to those reports filed with or furnished to the SEC. Access to these filings on our website is available free of charge. Copies are also available, without charge, from Intrexon Corporation Investor Relations, 20374 Seneca Meadows Parkway, Germantown, Maryland 20876. Reports filed with the SEC may be viewed at www.sec.gov or obtained at the SEC Public Reference Room at 100 F Street, NE, Washington, D.C. 20549. Information regarding the operation of the Public Reference Room may be obtained by calling the SEC at 1-800-SEC-0330. We also post our press releases on our website. Information on our website is not deemed to be incorporated by reference into this Annual Report.

In addition, our Corporate Governance Guidelines, Code of Business Conduct and Ethics, and charters for the Audit Committee, the Compensation Committee and the Nominating and Governance Committee are available free of charge to shareholders and the public through the "Corporate Governance" section of our website. Printed copies of the foregoing are available to any shareholder upon written request to our Communications Department at the address set forth on the cover of this Annual Report or may be requested through our website, www.dna.com.

Item 1A. Risk Factors

Investing in our common stock involves a high degree of risk. You should carefully consider the risks described below, together with the other information contained in this Annual Report, including our consolidated financial statements and the related notes appearing at the end of this Annual Report, before making your decision to invest in shares of our common stock. We cannot assure you that any of the events discussed in the risk factors below will not occur. These risks could have a material and adverse impact on our business, results of operations, financial condition or prospects. If that were to happen, the trading price of our common stock could decline, and you could lose all or part of your investment.

This Annual Report also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including the risks faced by us described below and elsewhere in this Annual Report. See "Special note regarding forward-looking statements" for information relating to these forward-looking statements.

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Risks related to our financial position, operating results and need for additional capital

We have a history of net losses, and we may not achieve or maintain profitability.

We have incurred net losses attributable to Intrexon since our inception, including losses attributable to Intrexon of $84.5 million, $81.8 million and $39.0 million in 2015, 2014 and 2013, respectively. As of December 31, 2015, we had an accumulated deficit of $542.7 million. We may incur losses and negative cash flow from operating activities for the foreseeable future. To date, we have derived a significant portion of our revenues from ECCs and license agreements and expect to derive a substantial portion of our revenues from these and additional ECCs, license agreements and JVs, as well as from sales of products and services for the foreseeable future. If our existing collaborators terminate their ECCs, license agreements or JVs with us or we are unable to enter into new ECCs, license agreements or JVs, our revenues could be adversely affected. In addition, certain of our collaborations and license agreements provide for milestone payments, future royalties and other forms of contingent consideration, the payment of which are uncertain as they are dependent on our collaborators' abilities and willingness to successfully develop and commercialize products. We expect a significant period of time will pass before the achievement of contractual milestones and the realization of royalties on products commercialized under our collaborations. As a result, we expect that our expenses will exceed revenues for the foreseeable future, and we may not achieve profitability. 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.

We may need substantial additional capital in the future in order to fund our business.

We expect our future capital requirements will be substantial, particularly as we continue to develop our business and expand our synthetic biology technology platform. Although we believe that our existing cash and cash equivalents and short-term and long-term investments and cash expected to be received from our current collaborators will enable us to fund our operating expenses and capital expenditure 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 commercial success of our ECCs, license agreements and JVs;
- whether we are successful in obtaining payments from our collaborators and licensees;
- whether we can enter into additional ECCs, license agreements or JVs;
- the progress and scope of the collaborative and independent research and development projects performed by us and our collaborators and licensees;
- the effect of any acquisitions of other businesses or technologies that we may make in the future;
- whether we decide to develop internal development or manufacturing capabilities; and
- the filing, prosecution and enforcement of our intellectual property.

We raised net proceeds of $328.2 million through two underwritten public offerings completed in January and August 2015. In November 2015, we entered into an "at-the-market" sales agreement with Cantor Fitzgerald & Co., or Cantor, under which we may offer and sell from time to time our common stock with aggregate proceeds of up to $200 million through Cantor as our sales agent. To date, no offerings have occurred under this agreement. If future financings involve the issuance of equity securities, our existing shareholders would suffer further 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 continue to incur losses, 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 ECCs, JVs or other 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.

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Our quarterly and 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 Annual Report:

- our ability to achieve or maintain profitability;
- our relationships, and the associated exclusivity terms, with collaborators and licensees in our target end markets;
- our ability to develop and maintain technologies that our collaborators and licensees continue to use and that new collaborators are seeking;
- our ability to enter into ECCs, license agreements or JVs;
- the feasibility of producing and commercializing products enabled by our technologies;
- obligations to provide resources to our collaborators or to the collaborations themselves pursuant to the terms of the relevant ECC, license agreement or JV agreement;
- our ability to manage our growth;
- the outcomes of research programs, clinical trials, or other product development and approval processes conducted by our collaborators and licensees;
- the ability of our collaborators and licensees to develop and successfully commercialize products enabled by our technologies;
- risks associated with the international aspects of our business;
- our ability to integrate any businesses or technologies we may acquire with our business;
- our ability to accurately report our financial results in a timely manner;
- our dependence on, and the need to attract and retain, key management and other personnel;
- our ability to obtain, protect and enforce our intellectual property rights;
- our ability to prevent the theft or misappropriation of our intellectual property, know-how or technologies;
- potential advantages that our competitors, the competitors of our collaborators, and potential competitors may have in securing funding or developing competing technologies or products;
- our ability to obtain additional capital that may be necessary to expand our business;
- our collaborators' ability to obtain additional capital that may be necessary to develop and commercialize products under our ECCs, license agreements and JVs;
- our exposure to the volatility associated with recording the fair value of securities of our collaborators held by us;
- business interruptions such as power outages and other natural disasters;
- public concerns about the ethical, legal and social ramifications of genetically engineered products and processes;
- our ability to use our net operating loss carryforwards to offset future taxable income; and
- the results of our consolidated subsidiaries.

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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 limited operating history, which may make it difficult to evaluate our current business and predict our future performance.

We have been in existence since 1998. From 1998 until 2010, our operations focused primarily on organizing and staffing our company and developing our technologies. On August 8, 2013, we completed our initial public offering and our stock was listed on the New York Stock Exchange, or NYSE. Our current business model is still being tested. In January 2011, we recognized our first revenues from our first ECC. We entered into our first JV in 2013. 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. Any assessments of our current business and predictions made about our future success or viability may not be as accurate as they could be if we had a longer operating history. We have encountered and will continue to encounter risks and difficulties frequently experienced by growing companies in rapidly changing industries. If we do not address these risks successfully, our business will be harmed.

We may pursue strategic acquisitions and investments which could have an adverse impact on our business if they are unsuccessful.

We have made acquisitions in the past and, if appropriate opportunities become available, we may acquire additional businesses, assets, technologies or products to enhance our business in the future. In connection with any future acquisitions, we could:

- issue additional equity securities, which would dilute our current shareholders;
- incur substantial debt to fund the acquisitions; or
- assume significant liabilities.

Although we conduct due diligence reviews of our acquisition targets, such processes may fail to reveal significant liabilities. Acquisitions involve numerous risks, including:

- problems integrating the purchased operations, facilities, 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.

Acquisitions also may 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 may encounter difficulties in connection with our acquisitions.

We recently completed several significant acquisitions, including our acquisitions of Trans Ova, ActoGeniX, Okanagan and Oxitec. We cannot be certain that any acquisition will be successful or that we will realize the anticipated benefits of the acquisition. In particular, we may not be able to realize the strategic and operational benefits and objectives we had anticipated.

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In addition, we may face increased competition in the markets for any acquired products. Any of the following factors may have a material adverse effect on our business, operating results and financial condition. These factors may include:

- the potential disruption of our ongoing business and diversion of management resources;
- unanticipated expenses related to the acquired operations;
- the impairment of relationships with the acquired customers;
- the impairment of relationships with key suppliers and their ability to meet our demand;
- potential unknown liabilities associated with the acquired business and technology;
- potential liabilities related to litigation involving the acquired companies;
- potential periodic impairment of goodwill and intangible assets acquired; and
- potential inability to retain, integrate and motivate key personnel.

We own equity interests in several of our collaborators and have exposure to the volatility and liquidity risks inherent in holding their common stock.

Our collaborators may have limited capital in which case we may allow them to pay technology access fees and milestone payments in shares of their common stock. As a result, we own equity interests in several of our collaborators. Owning equity in our collaborators further increases our exposure to the risks of our collaborators' businesses beyond our dependence on these collaborators to provide market and product development expertise, as well as sales, marketing and regulatory capabilities. Our equity ownership in our collaborators exposes us to volatility and the potential for negative returns. We may have restrictions on resale and/or limited markets to sell our equity ownership. In many cases, our equity position is a minority position which exposes us to further risk as we are not able to exert control over the companies in which we hold securities.

We evaluate prospective collaborators based on a variety of factors such as their capabilities, capacity and expertise in a defined field. The process by which we obtain equity interests in our collaborators and the factors we consider in deciding whether to acquire, hold or dispose of these equity positions may differ significantly from those that an independent investor would consider when purchasing equity interests in the collaborator. One significant factor would include our own expectation as to the success of our efforts to assist the collaborator in developing products enabled by our technologies.

We own common stock of several publicly traded companies and the values of those equity interests are subject to market price volatility. For each collaborator where we own equity securities, we make an accounting policy election to present them at either the fair value at the end of each reporting period or using the cost or equity method depending on our level of influence. We have adopted the fair value method of accounting for certain of these securities, and therefore, have recorded them at fair value at the end of each reporting period with the unrealized gain or loss recorded as a separate component of other income or expense, net for the period. As of December 31, 2015 and 2014, the aggregate original cost basis of these securities was $107.2 million and $173.9 million, respectively, and the market value was $83.7 million and $164.9 million, respectively. The fair value of these securities is subject to fluctuation in the future due to the volatility of the stock market, changes in general economic conditions and changes in the financial conditions of one or more collaborators.

The common stock of our collaborators may not be publicly traded, and if it is traded publicly, the trading market could be limited or have low trading volume. In some cases, we could hold unregistered shares and we may not have demand registration rights with respect to those shares. We evaluate whether any discounts for trading restrictions or other basis for lack of marketability should be applied to the fair value of the securities at inception of the ECC or JV. In the event we conclude that a discount should be applied, the fair value of the securities is adjusted at inception of the ECC or JV and re-evaluated at each reporting period thereafter. In all of these instances, we have substantial liquidity risk related to these holdings, and we may not be able to sell, or sell quickly, all or part of these equity interests.

In connection with future ECCs or JVs, we may, from time to time, receive from collaborators, both public and private, warrants, rights and/or options, all of which involve special risks. To the extent we receive warrants or options in connection with future ECCs or JVs, we would be exposed to risks involving pricing differences between the market value of underlying securities and our exercise price for the warrants or options, a possible lack of liquidity

and the related inability to close a warrant or options position, all of which could ultimately have an adverse effect.

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We rely on our collaborators, subsidiaries and other third parties 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 our collaborators and subsidiaries to provide us with complete and accurate information regarding revenues, expenses and payments owed to or by us on a timely basis. In addition, we intend to rely on current and future collaborators under our collaboration agreements and JVs to provide us with product sales and cost saving information in connection with royalties, if any, owed to us. If the information that we receive is not accurate, our consolidated financial statements may be materially incorrect and may require restatement, and we may not receive the full amount of consideration to which we are entitled under our collaboration agreements or JVs. Although we have audit rights with these parties, performing such an audit could be expensive and time consuming and may not be adequate to reveal any discrepancies in a timeframe consistent with our reporting requirements. We own a significant equity position in several of our collaborators, including a majority position in two of our collaborators. In the future, we may need to consolidate the financial statements of one or more other collaborators into our consolidated financial statements. Although we have contractual rights to receive information and certifications allowing us to do this, such provisions may not ensure that we receive information that is accurate or timely. As a result, we may have difficulty completing accurate and timely financial disclosures, which could have an adverse effect on our business.

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

As of December 31, 2015 and 2014, we had net operating loss carryforwards of approximately $248.7 million and $254.5 million, respectively, for U.S. federal income tax purposes available to offset future taxable income and U.S. federal and state research and development tax credits of $6.8 million prior to consideration of annual limitations that may be imposed under Section 382 of the Internal Revenue Code of 1986, as amended, or Section 382. These carryforwards begin to expire in 2022. Our past issuances of stock and mergers and acquisitions have resulted in ownership changes within the meaning of Section 382. As a result, the utilization of portions of our net operating losses may be subject to annual limitations. As of each of December 31, 2015 and 2014, approximately $16.4 million of our domestic net operating losses generated prior to 2008 are limited by Section 382 to annual usage limits of approximately $1.5 million. As of each of December 31, 2015 and 2014, approximately $19.1 million of domestic net operating losses were inherited via acquisition and are limited based on the value of the target at the time of the transaction. Future changes in stock ownership may also trigger an ownership change and, consequently, a Section 382 limitation. Our direct foreign subsidiaries have foreign loss carryforwards of approximately $109.7 million, most of which do not expire.

Risks related to our technologies and business operations

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

Our technologies involve the use of synthetic biologically engineered products or synthetic biological technologies. Public perception about the safety and environmental hazards of, and ethical concerns over, genetically engineered products and processes could influence public acceptance of our technologies, products and processes. If we and our collaborators are not able to overcome the ethical, legal and social concerns relating to synthetic biological engineering, products and processes using our technologies may not be accepted. These concerns could result in increased expenses, regulatory scrutiny, delays or other impediments to our programs or the public acceptance and commercialization of products and processes dependent on our technologies or inventions. The ability of our collaborators to develop and commercialize products, or processes using our technologies could be limited by public attitudes and governmental regulation.

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. Further, there is a risk that products produced using our technologies could cause adverse health effects or other adverse events, which could also lead to negative publicity.

The synthetic biological technologies that we develop may have significantly enhanced characteristics compared to those found in naturally occurring organisms, enzymes or microbes. While we produce many of these synthetic

biological technologies only for use in a controlled laboratory and industrial environment, the release of such synthetic biological technologies 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.

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We may become subject to increasing regulation in the future.

Our ongoing research and development relies on evaluations in animals, which may become subject to bans or additional regulations. As described above, our research operations are also subject to various environmental regulations. However, while most of the current laws and regulations concerning synthetic biology relate to the end products produced using synthetic biology, this may change. For example, the Presidential Commission for the Study of Bioethical Issues in December 2010 recommended that the federal government oversee, but not regulate, synthetic biology research. The Presidential Commission also recommended that the government lead an ongoing review of developments in the synthetic biology field and that the government conduct a reasonable risk assessment before the field release of synthetic organisms. Synthetic biology may become subject to additional government regulations as a result of the recommendations, which could require us to incur significant additional capital and operating expenditures and other costs in complying with these laws and regulations.

We have limited experience bringing new products through development and successful commercialization. Even if our technologies enable new products, we or our collaborators may not be successful in commercializing the products that result from our technologies.

Even if our technologies enable new products, there is no guarantee that we or our collaborators will be successful in creating additional products enabled by our technologies. Furthermore, our collaborators may not be able to commercialize the resulting products or may decide to use other methods competitive with our technologies that do not utilize synthetic biology. Several of our wholly and majority-owned subsidiaries have recently received regulatory approvals, including AquaBounty and Okanagan. These approvals do not, however, guarantee our success in commercializing the products of these subsidiaries. If we are not successful in commercializing our products, our business could be harmed.

The FDA has not yet approved any gene therapies for use in humans or animals.

The FDA has not yet approved any gene therapies for use in humans or animals. The field of gene therapies is experimental and has not yet proven successful in many clinical trials. Clinical trials with gene therapies have encountered a multitude of significant technical problems in the past, including unintended integration with host DNA leading to serious adverse events, poor levels of protein expression, transient protein expression, viral overload, immune reactions to either viral capsids utilized to deliver DNA, DNA itself, proteins expressed or cells transfected with DNA. There can be no assurance that our development efforts or those of our collaborators will be successful, that we or they will receive the regulatory approvals necessary to initiate clinical trials, where applicable, or that we will ever be able to successfully commercialize a product enabled by our technologies. To the extent that we or our collaborators utilize viral constructs or other systems to deliver gene therapies and the same or similar delivery systems demonstrate unanticipated and/or unacceptable side effects in preclinical or clinical trials conducted by ourselves or others we may be forced to, or elect to, discontinue development of such products.

If we lose key personnel, including key management personnel, or are unable to attract and retain additional personnel, it could 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 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, including our Chief Executive Officer, Randal J. Kirk, our Chief Operating Officer, Krish S. Krishnan, or our Chief Science Officer, Thomas D. Reed, 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. We currently maintain key man insurance on Dr. Reed in the amount of $25.0 million; however, that coverage would likely be inadequate to compensate for the loss of his services. 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 our technologies for our target markets and entering into ECCs, JVs 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, synthetic biology and other technology-based businesses, or due to the unavailability of personnel with the qualifications or experience necessary for our business. 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. Competition for experienced scientists and other technical personnel from numerous companies and academic and other research institutions may limit our ability to attract and retain such personnel 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.

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Our planned activities will require additional expertise in specific industries and areas applicable to the products and processes developed through our technologies 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 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.

We may encounter difficulties managing our growth, which could adversely affect our business.

Currently, we are working simultaneously on multiple projects targeting several market sectors, including activities in the health, food, energy, environment and consumer sectors. These diversified operations place increased demands on our limited resources and require us to substantially expand the capabilities of our administrative and operational resources and to attract, train, manage and retain qualified management, technicians, scientists and other personnel. As our operations expand domestically and internationally, we will need to continue to manage multiple locations and additional relationships with various customers, collaborators, suppliers and other third parties. Our ability to manage our operations, growth and various projects effectively will require us to make additional investments in our infrastructure to continue to improve our operational, financial and management controls and our reporting systems and procedures and to attract and retain sufficient numbers of talented employees, which we may be unable to do effectively. As a result, we may be unable to manage our expenses in the future, which may negatively impact our gross margins or operating margins in any particular quarter. In addition, we may not be able to successfully improve our management information and control systems, including our internal control over financial reporting, to a level necessary to manage our growth.

Competitors and potential competitors may develop products and technologies that make ours obsolete or garner greater market share than ours.

We do not believe that we have any direct competitors who provide comparable technologies of similar depth and breadth which enable to the same extent the commercialization of products developed using synthetic biology across a broad spectrum of biologically based industries. However, there are companies that have competing technologies for individual pieces of our proprietary suite of complementary technologies. One portion of our proprietary technology related to DNA synthesis and assembly includes the ability to synthesize new DNA. We believe the following companies engage in the manufacture of DNA components: DNA 2.0, Inc., Blue Heron Biotech, LLC (a subsidiary of OriGene) and Life Technologies Corporation, now part of Thermo Fisher Scientific Inc.

The synthetic biologics industry and each of the commercial sectors we have targeted are characterized by rapid technological change and extensive competition. Our future success will depend on our ability to maintain a competitive position with respect to technological advances. Academic institutions also are working in this field. Technological development by others may result in our technologies, as well as products developed by our collaborators using our technologies, becoming obsolete.

The rapidly evolving market for developing genetically engineered T-cells in particular, is characterized by intense competition and rapid innovation. Genetically engineering T-cells faces significant competition in the chimeric antigen receptor (CAR) technology space from multiple companies and their collaborators, such as Novartis/University of Pennsylvania, Bluebird Bio/Celgene/Baylor College of Medicine, Kite Pharma/National Cancer Institute, Juno Therapeutics/Fred Hutchinson Cancer Research Center/Memorial Sloan-Kettering Cancer Center/Seattle Children's Research Institute, Cellectis/Pfizer and Adaptimmune/GSK. We face competition from non-cell based treatments offered by other companies such as Amgen, AstraZeneca, Bristol-Myers, Incyte, Merck, and Roche.

Our ability to compete successfully will depend on our ability to develop proprietary technologies that can be used by our collaborators to produce 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. Certain of our competitors may benefit from local government subsidies and other incentives that are not available to us or our collaborators. 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 or our collaborators can. As more companies develop new intellectual property in our markets, a competitor could acquire patent or other rights that may limit products using our technologies, which could lead to litigation.

We may be sued for product liability.

Each of our collaborations requires the collaborator to indemnify us for liability related to products produced pursuant to the ECC or JV and to obtain insurance coverage related to product liability in amounts considered standard for the industry. We believe that these industry-standard coverage amounts range from $10.0 million to $40.0 million in the aggregate. Even so, we may be named in product liability suits relating to products that are produced by our collaborators using our technologies.

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These claims could be brought by various parties, including other companies who purchase products from our collaborators or by the end users of the products. We cannot guarantee that our collaborators will not breach the indemnity and insurance coverage provisions of the ECCs or JVs. Further, insurance coverage is expensive and may be difficult to obtain, and may not be available to us or to our collaborators in the future on acceptable terms, or at all. We cannot assure you that our collaborators will have adequate insurance coverage against potential claims. In addition, although we currently maintain product liability insurance for our technologies 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. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our product candidates. Regardless of the merits or eventual outcome, liability claims may result in:

- reduced resources of our management to pursue our business strategy;
- decreased demand for products enabled by our technologies;
- injury to our or our collaborators' reputations and significant negative media attention;
- withdrawal of clinical trial participants;
- initiation of investigations by regulators;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- significant costs to defend resulting litigation;
- substantial monetary awards to trial participants or patients;
- loss of revenue; and
- the inability to commercialize any products using our technologies.

We depend on sophisticated information technology and infrastructure.

We rely on various information systems to manage our operations. These systems are complex and include software that is internally developed, software licensed from third parties and hardware purchased from third parties. These products may contain internal errors or defects, particularly when first introduced or when new versions or enhancements are released. Failure of these systems could have an adverse effect on our business, which in turn may materially adversely affect our operating results and financial condition.

We may incur significant costs complying with environmental, health and safety laws and regulations, and failure to comply with these laws and regulations could expose us to significant liabilities.

We use hazardous chemicals and radioactive and biological materials in our business and are subject to a variety of federal, state, local and international laws and regulations governing, among other matters, the use, generation, manufacture, transportation, storage, handling, disposal of, and human exposure to these materials both in the United States and overseas, including regulation by governmental regulatory agencies, such as the Occupational Safety and Health Administration and the U.S. EPA. We have incurred, and will continue to incur, capital and operating expenditures and other costs in the ordinary course of our business in complying with these laws and regulations.

We have international operations and assets and may have additional international operations and assets in the future. Our international operations and assets may be subject to various economic, social and governmental risks.

Our international operations and any future international operations may expose us to risks that could negatively impact our future results. Our operations may not develop in the same way or at the same rate as might be expected in a country with an economy similar to the United States. The additional risks that we may be exposed to in these cases include, but are not limited to:

- tariffs and trade barriers;

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- currency fluctuations, which could decrease our revenues or increase our costs in U.S. dollars;
- regulations related to customs and import/export matters;
- tax issues, such as tax law changes and variations in tax laws;
- limited access to qualified staff;
- inadequate infrastructure;
- cultural and language differences;
- inadequate banking systems;
- different and/or more stringent environmental laws and regulations;
- restrictions on the repatriation of profits or payment of dividends;
- crime, strikes, riots, civil disturbances, terrorist attacks or wars;
- nationalization or expropriation of property;
- law enforcement authorities and courts that are weak or inexperienced in commercial matters; and
- deterioration of political relations among countries.

Our plans to pursue development and commercialization of adoptive cellular therapies based on chimeric antigen receptor (CAR) T-cell therapies, or CARs, are new approaches to cancer treatment that present significant challenges in a competitive landscape and the success of our efforts depends in large part on our owned and licensed intellectual property, and our efforts may be affected by litigation and developments in intellectual property law outside of our control.

We intend to employ technologies licensed from MD Anderson (as described above in "Item 1. Business, Mergers, acquisitions, and technology in-licensing"), together with our existing suite of proprietary technologies, through both our existing exclusive collaboration agreement with ZIOPHARM and our existing collaboration with Ares Trading S.A., or Ares Trading, a subsidiary of the biopharmaceutical business of Merck KGaA, to pursue the development and commercialization of adoptive cellular therapies based on CARs under control of RheoSwitch technology targeting a variety of cancer malignancies. Because this is a new approach to cancer immunotherapy and cancer treatment generally, developing and commercializing product candidates subjects us and our collaborators to a number of challenges, including:

- obtaining regulatory approval from the FDA and other regulatory authorities that have very limited experience with the commercial development of genetically modified T-cell therapies for cancer;
- developing and deploying consistent and reliable processes for engineering a patient's T-cells ex vivo and infusing the engineered T-cells back into the patient;
- possibly conditioning patients with chemotherapy in conjunction with delivering each of the potential products, which may increase the risk of adverse side effects of the potential products;
- educating medical personnel regarding the potential side effect profile of each of the potential products, such as the potential adverse side effects related to cytokine release;
- developing processes for the safe administration of these potential products, including long-term follow-up for all patients who receive the potential products;
- sourcing additional clinical and, if approved, commercial supplies for the materials used to manufacture and process the potential products;
- developing a manufacturing process and distribution network with a cost of goods that allows for an attractive return on investment;

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- establishing sales and marketing capabilities after obtaining any regulatory approval to gain market acceptance;
- developing therapies for types of cancers beyond those addressed by the current potential products; and
- not infringing the intellectual property rights, in particular, the patent rights, of third parties, including competitors developing alternative CAR T-cell therapies.

We cannot be sure that T-cell immunotherapy technologies developed in our collaborations will yield satisfactory products that are safe and effective, scalable, or profitable.

We and our collaborators are dependent on patents, know-how, and proprietary technology in our collaborations, both our own and licensed from others. Any termination of these licenses could result in the loss of significant rights and could harm our ability to commercialize our product candidates. Disputes may also arise between us and these licensors regarding intellectual property subject to a license agreement, including those relating to:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes, and the technology and processes of our collaborators, infringe on intellectual property of the licensor that is not subject to the license agreement;
- our right to sublicense patent and other rights to third parties under collaborative development relationships;
- whether we and our collaborators are complying with our diligence obligations with respect to the use of the licensed technology in relation to our development and commercialization of our potential products under our collaborations; and
- the allocation of ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and by us and our collaborators.

If disputes over intellectual property that we or our collaborators have licensed in connection with our collaboration prevent or impair our or our collaborators ability to maintain our current licensing arrangements, particularly with MD Anderson, on acceptable terms, we may be unable to successfully develop and commercialize the affected potential products. We are generally also subject to all of the same risks with respect to protection of intellectual property that we license as we are for intellectual property that we own. If we or our licensors fail to adequately protect this intellectual property, our ability to commercialize potential products under our collaborations could suffer.

Risks associated with our business model

If we fail to maintain and successfully manage our existing, or enter into new, ECCs or JVs, we may not be able to develop and commercialize our technologies and achieve or sustain profitability.

Our ability to enter into, maintain and manage collaborations in our target markets is fundamental to the success of our business. We currently rely, and intend to rely for the foreseeable future, on our collaborators to develop products enabled by our technologies and then to manufacture, market, distribute and sell these products. We intend to enter into other strategic ECCs or JVs to produce, market and sell products enabled by the technologies that we have developed and will continue to develop. However, we may not be successful in entering into ECCs or JVs with future strategic collaborators. Any failure to enter into ECCs or JVs in our target market sectors on favorable terms could delay or hinder our ability to develop and commercialize our technologies and could increase our costs of development and commercialization.

We have entered into ECCs or JVs with strategic collaborators to develop products enabled by our technologies. There can be no guarantee that we can successfully manage these ECCs or JVs. Under the ECCs, we must use diligent efforts to carry out development activities under the ECC. The exclusivity provisions of the ECCs restrict our ability to commercialize our technologies in the designated field covered by the ECC. In most cases, the collaborator may terminate the ECC with us for any reason upon 90 days' notice. In all cases, the ECC may be terminated if we fail to exercise diligent efforts or breach, and fail to cure, other provisions of the ECC. In addition, since our efforts to date have focused on a small number of collaborators in certain targeted sectors, our business would be adversely affected if one or more of these collaborators terminate their ECCs or JVs, fail to use our technologies or fail to develop commercially viable products enabled by our technologies.

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Dependence on ECCs or JVs also will subject us to other risks, including:

- we have relinquished important rights regarding the commercialization, marketing and distribution of products and we may disagree with our collaborators' plans in these areas;
- although we retain broad rights with respect to intellectual property developed under the ECCs, our collaborators have the right, under certain circumstances, to take control of the enforcement of such intellectual property;
- we may have lower revenues than if we were to develop, manufacture, market and distribute products enabled by our technologies ourselves;
- a collaborator could, without the use of our synthetic biology technologies, develop and market a competing product either independently or in collaboration with others, including our competitors;
- our collaborators could be undercapitalized or fail to secure sufficient resources to fund the development and/or commercialization of the products enabled by our technologies in accordance with the ECC;
- our collaborators could become unable or less willing to expend their resources on research and development or commercialization efforts with respect to our technologies due to general market conditions, their financial condition or other circumstances beyond our control;
- we may be unable to manage multiple simultaneous ECCs or JVs or fulfill our obligations with respect thereto;
- disagreements with a collaborator could develop and any conflict with a collaborator could reduce our ability to enter into future ECCs or JVs and negatively impact our relationships with one or more existing collaborators;
- our collaborators could terminate our ECC or JV with them, in which case, our collaborators may retain rights related to certain products, we may not be able to find another collaborator to develop different products in the field and we may not be able to develop different products in the field ourselves;
- our business could be negatively impacted if any of our collaborators undergo a change of control to a third party who is not willing to work with us on the same terms or commit the same resources as our current collaborator; and
- our collaborators may operate in countries where their operations could be adversely affected by changes in the local regulatory environment or by political unrest.

If any of these events occur, or if we fail to maintain our ECCs or JVs with our collaborators, we may not be able to commercialize our existing and potential technologies, grow our business or generate sufficient revenues to support our operations.

Our subsidiaries and certain of our collaborators, including some businesses over which we have significant influence, will need additional capital.

In order for our subsidiaries and certain of our collaborators to execute on their business plans, they will have future capital requirements. We may be asked to, or need to, invest additional funds in these subsidiaries or collaborators so that they can execute on their business plans. If we fail to invest such additional funds, the subsidiary or collaborator, as the case may be, may not have sufficient capital to continue operations.

We rely on our collaborators to develop, commercialize and market products, and they may not be successful.

We depend on our collaborators to commercialize the products enabled by our technologies. If our collaborators are not able to successfully develop the products enabled by our technologies, none of our enabled products will become commercially available and we will receive no back-end payments under our ECCs or JVs. Because we do not currently and may never possess the resources necessary to independently develop and commercialize all of the potential products that may result from our technologies, our ability to succeed in markets we have currently targeted depends on our ability to enter into ECCs or JVs to develop and commercialize potential products. Some of our existing collaborators do not themselves have the resources necessary to commercialize products and they in turn will need to rely on additional sources of financing or third party collaborations. In addition, pursuant to our current ECCs or JVs and similar ECCs or JVs that we may enter into in the future, we have limited or no control over the amount or timing of resources that any collaborator is able or willing to devote to

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developing products or collaborative efforts. Any of our collaborators may fail to perform its obligations under the ECC. Our collaborators may breach or terminate their ECCs or JVs with us or otherwise fail to conduct their collaborative activities successfully and in a timely manner. If any of these events were to occur, our revenues, financial condition and results of operations could be adversely affected.

The sales process for our ECCs or JVs may be lengthy and unpredictable, and we may expend substantial funds and management effort with no assurance of successfully entering into new collaborations to commercialize our technologies.

The sales process for our ECCs or JVs may be lengthy and unpredictable. Our sales and licensing efforts may require the effective demonstration of the benefits, value, differentiation, validation of our technologies and services and significant education and training of multiple personnel and departments within the potential collaborator's organization. Though we have made efforts to standardize our ECCs or JVs, we may be required to negotiate ECCs or JVs containing terms unique to each collaborator, which would lengthen the sales cycle. We may expend substantial funds and management effort with no assurance that we will execute an ECC, JV or otherwise sell our technologies or services. In addition, this lengthy sales cycle makes it more difficult for us to accurately forecast revenue in future periods and may cause revenues and operating results to vary significantly in such periods.

We have entered into a number of ECCs and JVs to date, and we require collaborators to successfully commercialize the products enabled by our technologies.

Our success depends upon entering into ECCs and JVs with a number of collaborators across a broad spectrum of industries. There is a risk that we may not be able to demonstrate the value proposition of our technologies with enough collaborators across enough industries for us to be successful. We intend to pursue additional ECCs and JVs, but may be unable to do so on terms satisfactory to us, or at all. Our current ECCs and JVs and any new collaborations we are able to enter into in one or more of the markets we have targeted may not be successful. Moreover, because we have limited financial and managerial resources, we will be required to prioritize our application of resources to particular development efforts. Any resources we expend on one or more of these efforts could be at the expense of other potentially profitable opportunities. If we focus our efforts and resources on one or more of these markets and they do not lead to commercially viable products, our revenues, financial condition and results of operations could be adversely affected.

Many of our current collaborators have no experience producing products at the commercial scale needed for the development of their business, and they will not succeed if they cannot effectively commercialize their products.

In addition to developing products using our technologies, our collaborators must demonstrate the ability to utilize our technologies to produce desired products at the commercial scale and on an economically viable basis or they must collaborate with others to do so. The products and processes developed using our technologies may not perform as expected when applied at commercial scale, or our collaborators may encounter operational challenges for which we and they are unable to devise a workable solution. For example, contamination in the production process could decrease process efficiency, create delays and increase our collaborators' costs. Moreover, under the terms of our ECCs or JVs, we limit the ability of our collaborators to partner their programs with third parties. We and our collaborators may not be able to scale up our production in a timely manner, if at all, even if our collaborators successfully complete product development in their laboratories and pilot and demonstration facilities. If this occurs, the ability of our collaborators to commercialize products and processes using our technologies will be adversely affected, and, with respect to any products that are brought to market, our collaborators may not be able to lower the cost of production, which would adversely affect our ability to increase the future profitability of our business.

The markets in which our collaborators are developing products using our technologies are subject to extensive regulation, and we rely on our collaborators to comply with all applicable laws and regulations.

Our technologies are used in products that are subject to extensive regulation by governmental authorities. We depend on our collaborators to comply with these laws and regulations with respect to products they produce using our technologies and we do not independently monitor whether our collaborators comply with applicable laws and regulations. If our collaborators fail to comply with applicable laws and regulations, we are subject to substantial financial and operating risks because we depend on our collaborators to produce the end products enabled by our technologies for sale, and because in many cases we have, or in the future may have, a substantial equity interest in

our collaborators. These regulatory risks are extensive and include the following:

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- complying with these regulations, including seeking approvals, the uncertainty of the scope of future regulations, and the costs of continuing compliance with regulations could affect the sales and profitability of our collaborators and materially impact our operating results;
- our business could be adversely affected if the processes used by our collaborators to manufacture their final products fail to be approved by the applicable regulatory authorities;
- where products are subject to regulatory approval, the regulatory approval process can be lengthy, costly, time consuming and inherently unpredictable, and if our collaborators are ultimately unable to obtain regulatory approval for products using our technologies, our business will be substantially harmed;
- even if our collaborators are able to commercialize products using our technologies, the product may become subject to post-approval regulatory requirements, unfavorable pricing regulations, third-party payor reimbursement practices or regulatory reform initiatives that could harm our business;
- we and our collaborators conduct on-going research and development that relies on evaluations in animals, which may become subject to bans or additional regulations;
- compliance with existing or future environmental laws and regulations could have a material adverse impact on the development and commercialization of products using our technologies; and
- to the extent products produced using our technologies are commercialized outside the United States, they will be subject to additional laws and regulations under the jurisdictions in which such products are commercialized.

The markets in which we and our collaborators are developing products using our technologies are highly competitive.

The markets in which we and our collaborators are developing products are, and will continue to be, highly competitive, and there can be no assurance that we or our collaborators will be able to compete effectively. There are numerous companies presently in these markets that are developing products that may compete with, and could adversely affect the prices for, any products developed by our collaborators using our technologies. Many of these competitors and potential competitors are well-established companies with significant resources and experience, along with well-developed distribution systems and networks for their products, valuable historical relationships with potential customers and extensive sales and marketing programs for their products. Some of these competitors may use these resources and their market influence to impede the development and/or acceptance of the products developed by our collaborators using our technologies.

To the extent that any of our collaborators' competitors are more successful with respect to any key competitive factor or our collaborators are forced to reduce, or are unable to raise, the price of any products enabled by our technologies in order to remain competitive, our operating results and financial condition could be materially adversely affected. Competitive pressure could arise from, among other things, safety and efficacy concerns, limited demand or a significant number of additional competitive products being introduced into a particular market, price reductions by competitors, the ability of competitors to capitalize on their economies of scale, the ability of competitors to produce or otherwise procure products similar or equivalent to those of our collaborators at lower costs and the ability of competitors to access more or newer technology than our collaborators can access (including our own).

Our right to terminate our ECCs is limited.

Generally, we do not have the right to terminate an ECC except in limited circumstances such as the collaborator's failure to exercise diligent efforts in performing its obligations under the ECC, including its development of products enabled by our technologies, or its breach of a term of the ECC that remains uncured for a specified period of time. Moreover, each of our collaborators receives an exclusive license to use all of our technologies in a designated field, potentially in perpetuity. The collaborators we choose in particular fields may not be in the best position to maximize the value of our technologies in that field, if they are capable of commercializing any products at all. In addition, the scope of the field for a particular ECC may prove to be too broad and result in the failure to maximize the value of our technologies in that field.

A significant portion of our business is conducted by joint ventures that we cannot operate solely for our benefit.

A significant portion of our business is carried out by JVs. In JVs we share ownership and management of a company with one or more parties who may not have the same goals, strategies, priorities or resources as we do and may compete with us outside the JV. JVs are intended to be operated for the benefit of all JV partners, rather than for our exclusive benefit. Operating a

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business as a JV often requires additional organizational formalities as well as time-consuming procedures for sharing information and making decisions. In JVs we are required to foster our relationships with our JV partners as well as promote the overall success of the JV, and if a JV partner changes or relationships deteriorate, our success in the JV may be materially adversely affected. The benefits from a successful JV are shared among the JV partners, so we do not receive all the benefits from our successful JVs. Moreover, as a partial owner of a JV, we are exposed to potential risks and liabilities that we do not face when we enter into an ECC.

Risks related to our intellectual property

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 through costly litigation or administrative proceedings.

Our success depends in part on our ability to obtain patents and maintain adequate protection of our intellectual property in the United States and abroad for our suite of technologies and resultant products and potential products. We have adopted a strategy of seeking patent protection in the United States and abroad with respect to certain of the technologies used in or relating to our products and processes. We have also in-licensed rights to additional patents and pending patent applications in the United States and abroad. We intend to continue to apply for patents relating to our technologies, methods and products as we deem appropriate.

We have strategic positioning with respect to our key technologies including patent portfolios directed to: our switch technology covering aspects of our gene switches, such as our RheoSwitch Therapeutic System, and gene modulation systems, vectors, cells and organisms containing these switches, and their use; our activator ligand technology covering aspects of our activator ligands and their use; and our cell identification and selection technology covering aspects of our cell identification and selection platform, including our cell purification, isolation, characterization and manipulation technologies. We have also filed counterpart patents and patent applications in other jurisdictions, including Australia, Argentina, Brazil, Canada, China, Europe, Hong Kong, India, Indonesia, Israel, Japan, Korea, Mexico, New Zealand, Philippines, Russia, Singapore, South Africa and Taiwan. In the future we may file in these or additional jurisdictions as deemed appropriate for the protection of our technologies.

The enforceability of patents, as well as the actual patent term and expiration thereof, involves complex legal and factual questions and, therefore, the extent of enforceability cannot be guaranteed. 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, brought significant changes to the U.S. 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, or the USPTO, 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 Court of Appeals for the Federal Circuit and United States 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 we were the first to invent the inventions covered by our pending patent applications, we were the first to file patent applications for these inventions, the patents we have obtained, particularly certain patents claiming nucleic acids, proteins, or methods, are valid and enforceable, and 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 technologies, 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 into the United States or other territories products, or information leading to potentially competing products, made using our

inventions in countries where we do not have patent protection for those inventions. If competitors are able to use our technologies, 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 harm our business.

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We also rely on trade secrets to protect our technologies, especially in cases when we believe patent protection is not appropriate or obtainable. However, trade secrets are difficult to protect. While we require our employees, academic collaborators, collaborators, consultants and other contractors to enter into confidentiality agreements, we may not be able to adequately protect our trade secrets or other proprietary or licensed information. If we cannot maintain the confidentiality of our proprietary and licensed technologies and other confidential information, our ability and that of our licensor to receive patent protection and our ability to protect valuable information owned or licensed by us may be imperiled. Enforcing a claim that a third-party entity illegally obtained and is using any of our trade secrets is expensive and time consuming, and the outcome is unpredictable. Moreover, our competitors may independently develop equivalent knowledge, methods and know-how.

Litigation or other proceedings or third-party claims of intellectual property infringement could require us to spend significant time and money and could prevent us from commercializing our technologies or impact our stock price.

Our commercial success also depends in part on not infringing patents and proprietary rights of third parties, and not 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 or our collaborators' 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, also may block our ability to commercialize products or processes in these countries if we are unable to circumvent or license them.

The biotechnology industry is characterized by frequent and extensive litigation regarding patents and other intellectual property rights. Many 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 management time from focusing on business operations and could cause us to spend significant amounts of money. Some of our competitors may have significantly greater resources and, therefore, they are likely to be better able to sustain the cost of complex patent or intellectual property litigation than we could. The uncertainties associated with litigation could have a material adverse effect on our ability to raise the funds necessary to continue our business or to enter into additional collaborations with others.

Furthermore, any potential intellectual property litigation also could force us or our collaborators to do one or more of the following:

- stop selling, incorporating or using products that use the intellectual property at issue;
- 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, if at all; or
- 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, or which could be technically infeasible.

The patent landscape in the field of synthetic biology is particularly complex. We are aware of U.S. and foreign patents and pending patent applications of third parties that cover various aspects of synthetic biology including patents that some may view as covering aspects of our technologies. In addition, there may be patents and patent applications in the field of which we are not aware. In many cases, the technologies we develop are early-stage technologies and we and our collaborators are just beginning the process of designing and developing products using these technologies. Although we will seek to avoid pursuing the development of products that may infringe any patent claims that we believe to be valid and enforceable, we and our collaborators may fail to do so. Moreover, given the breadth and number of claims in patents and pending patent applications in the field of synthetic biology and the complexities and uncertainties associated with them, third parties may allege that we or our collaborators are infringing upon patent claims even if we do not believe such claims to be valid and enforceable.

Except for claims we believe will not be material to our financial results, no third party has asserted a claim of infringement against us, others may hold proprietary rights that could prevent products using our technologies from being marketed. Any patent-related legal action against persons who license our technologies, our collaborators or us

claiming damages and seeking to enjoin commercial activities relating to products using our technologies or our processes could subject us to potential liability for damages and require our licensor or us to obtain a license to continue to manufacture or market such products or any future product candidates that use our technologies. We cannot predict whether we or our licensor would prevail in any such actions or that any license required under any of these patents would be made available on commercially acceptable terms,

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if at all. In addition, we cannot be sure that any such products or any future product candidates or processes could be redesigned to avoid infringement, if necessary. Accordingly, an adverse determination in a judicial or administrative proceeding, or the failure to obtain necessary licenses, could prevent our collaborators from developing and commercializing products using our technologies, which could harm our business, financial condition and operating results.

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 declared by the USPTO 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, an interference may result in loss of certain of our important 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.

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

The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process. Given the size of our intellectual property portfolio, compliance with these provisions involves significant time and expense. There are situations in which noncompliance can result in abandonment or lapse of a patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, competitors might be able to enter the market earlier than would otherwise have been the case.

If we do not obtain additional protection under the Hatch-Waxman Amendments and similar foreign legislation by extending the patent terms and obtaining data exclusivity for our technologies, our business may be materially harmed.

Depending upon the timing, duration and specifics of FDA marketing approval of products using our technologies, one or more of the U.S. patents we own or license may be eligible for limited patent term restoration under the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit a patent restoration term of up to five years as compensation for patent term lost during product development and the FDA regulatory review process. However, we may not be granted an extension because of, for example, failing to apply within applicable deadlines, failing to apply prior to expiration of relevant patents or otherwise failing to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than we request. If we are unable to obtain patent term extension or restoration or the term of any such extension is less than we request, our competitors may obtain approval of competing products following our patent expiration, and our ability to generate revenues could be materially adversely affected.

Enforcing our intellectual property rights may be difficult and unpredictable.

If we were to initiate legal proceedings against a third party to enforce a patent claiming one of our technologies, the defendant could counterclaim that our patent is invalid and/or unenforceable or assert that the patent does not cover its manufacturing processes, manufacturing components or products. Proving patent infringement may be difficult, especially where it is possible to manufacture a product by multiple processes. Furthermore, in patent litigation in the United States, defendant counterclaims alleging both invalidity and unenforceability are commonplace. Although we believe that we have conducted our patent prosecution in accordance with the duty of candor and in good faith, the outcome following legal assertions of invalidity and unenforceability during patent litigation is unpredictable. With respect to the validity of our patent rights, we cannot be certain, for example, that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would not be able to exclude others from practicing the inventions claimed therein. Such a loss of patent protection could have a material adverse impact on our business. Even if our patent rights are found to be valid and enforceable, patent claims that survive litigation may not cover commercially valuable

products or prevent competitors from importing or marketing products similar to our own, or using manufacturing processes or manufacturing components similar to those used to produce the products using our technologies. Although we believe we have obtained assignments of patent rights from all inventors, if an inventor did not adequately assign their patent rights to us, a third party could obtain a license to the patent from such inventor. This could preclude us from enforcing the patent against such third party.

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

The laws of some foreign countries 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 protection, particularly those relating to synthetic biology. This could make it difficult for us to stop the infringement of our patents or misappropriation of our other intellectual property rights. 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. Accordingly, our efforts to protect our intellectual property rights in such countries may be inadequate.

If our technologies or products using our technologies are stolen, misappropriated or reverse engineered, others could use the technologies to produce competing technologies or products.

Third parties, including our collaborators, contract manufacturers, contractors and others involved in our business often have access to our technologies. If our technologies, or products using our technologies, were stolen, misappropriated or reverse engineered, they could be used by other parties that may be able to reproduce our technologies or products using our technologies 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.

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

We have taken measures to protect our trade secrets and proprietary information, but these measures may not be effective. We require our new 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 technologies or products using our technologies 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.

Risks related to our subsidiary operations

We may have limited success in gaining consumer acceptance of the products of our operating subsidiaries, particularly in the face of current public opposition and current and potential future laws.

There is an active and vocal group of opponents to genetically modified organisms who wish to ban or restrict the technology and who, at a minimum, hope to sway consumer perceptions and acceptance of this technology. Their efforts include regulatory legal challenges and labeling campaigns for genetically modified products, as well as application of pressure to consumer retail outlets seeking a commitment not to carry genetically modified products. Under current labeling laws, we are not required to label our AquAdvantage® Salmon or our Arctic® apples at the retail level as containing genetically modified ingredients, but several states have either passed laws or are considering new laws that would require labeling genetically modified ingredients as such at the retail level, which could negatively impact consumer acceptance. Further, these groups have a history of bringing legal action against companies attempting to bring new biotechnology products to market. For example, on January 16, 2014, an application was filed by two non-governmental organizations with the Canadian Federal Court seeking judicial review to declare invalid the decision by the Canadian Minister of the Environment to publish in the Canadian Gazette a Significant New Activity Notice, or SNAN, with respect to AquAdvantage® Salmon. We may be subject to future additional litigation brought by one or more of these organizations in their attempt to block the development or sale of our products. In addition, animal rights groups and various other organizations and individuals have attempted to stop genetic engineering activities by pressing for legislation and additional regulation in these areas. We may not be able to overcome the negative consumer perceptions and potential legal hurdles that these organizations seek to instill or assert against our products and our business could be harmed.

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The agricultural products of several of our operating subsidiaries are subject to disease outbreaks which can increase the cost of production and/or reduce production harvests, and the loss of existing organisms and germplasm would result in the loss of commercial technology.

Several of the products of our operating subsidiaries, including Trans Ova, AquaBounty and Okanagan, are subject to periodic outbreaks of a variety of diseases. Although these companies take measures to protect their stock, there can be no assurance that a disease will not damage or destroy existing organisms or germplasm. The economic impact of disease to our subsidiaries' production systems can be significant, as farmers must incur the cost of preventive measures, such as vaccines and antibiotics, and then if infected, the cost of lost or reduced harvests.

We are exposed to exchange rate fluctuation.

We have international subsidiaries in Belgium, Brazil, Canada, England and Hungary. As a consequence, we are exposed to risks associated with changes in foreign currency exchange rates. We present our consolidated financial statements in U.S. dollars. Our international subsidiaries have assets and liabilities denominated in currencies other than the U.S dollar. Future expenses and revenues of our international subsidiaries are expected to be denominated in currencies other than in U.S. dollars. Therefore, movements in exchange rates to translate from foreign currencies may have an impact on our reported results of operations, financial position and cash flows.

Risks related to our common stock

We do not anticipate paying cash dividends, and accordingly, shareholders should rely on stock appreciation for return on their investment.

We have never declared or paid cash dividends on our capital stock. We do not anticipate paying cash dividends in the future and intend to retain all of our future earnings, if any, to finance the operations, development and growth of our business. As a result, appreciation of the price of our common stock, which may never occur, will provide a return to shareholders. Investors seeking cash dividends should not invest in our common stock. In June 2015, we did provide our shareholders the opportunity to participate directly in the value generated by our ECC with ZIOPHARM by distributing all of our shares in ZIOPHARM to our shareholders as a special stock dividend. However, it is possible that we may never declare a special dividend again and shareholders should not rely upon potential future special dividends as a source of return on their investment.

Our stock price is volatile and purchasers of our common stock could incur substantial losses.

Our stock price has been, and is likely to continue to be, volatile. The market price of our common stock could fluctuate significantly for many reasons, including in response to the risks described in this "Risk Factors" section, or for reasons unrelated to our operations, such as reports by industry analysts, investor perceptions or negative announcements by our collaborators regarding their own performance, as well as industry conditions and general financial, economic and political instability. From January 1, 2014 through February 15, 2016, our common stock has traded as high as $69.45 per share and as low as $13.13 per share. The stock market in general as well as the market for biopharmaceutical companies in particular has experienced extreme volatility that has often been unrelated to the operating performance of particular companies. The market price of our common stock may be influenced by many factors, including, among others:

- announcements of acquisitions, collaborations, financings or other transactions by us;
- public concern as to the safety of our products;
- termination or delay of a development program;
- the recruitment or departure of key personnel; and
- the other factors described in this "Risk Factors" section.

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

The trading market for our shares of common stock depends, in part, on 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 securities or industry analysts do not continue to cover us, the trading price for our shares of common stock may be negatively impacted. If one or more of the analysts who covers us downgrades our shares of common stock, changes their opinion of our shares or publishes inaccurate or

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unfavorable research about our business, our share price would likely decline. If one or more of these analysts ceases coverage of us or fails to publish reports on us regularly, demand for our shares of common stock could decrease and we could lose visibility in the financial markets, which could cause our share price and trading volume to decline.

If our executive officers, directors and largest shareholders choose to act together, they may be able to control our management and operations, acting in their own best interests and not necessarily those of other shareholders.

As of December 31, 2015, our executive officers, directors and beneficial holders of five percent or more of our outstanding stock owned approximately 56 percent of our voting common stock, including shares subject to outstanding options and warrants. As a result, these shareholders, acting together, would be able to significantly influence all matters requiring approval by our shareholders, including the election of directors and the approval of mergers or other business combination transactions, as well as our management and affairs. The interests of this group of shareholders may not always coincide with the interests of other shareholders, and they may act in a manner that advances their best interests and not necessarily those of other shareholders. This concentration of ownership control may:

- delay, defer or prevent a change in control;
- entrench our management and/or the board of directors; or
- impede a merger, consolidation, takeover or other business combination involving us that other shareholders may desire.

We have engaged in transactions with companies in which Randal J. Kirk, our Chief Executive Officer, and his affiliates have an interest.

We have engaged in a variety of transactions, including ECCs, with companies in which Mr. Kirk and affiliates of Mr. Kirk have a direct or indirect interest. See Notes 5 and 17 in our consolidated financial statements appearing elsewhere in this annual report on Form 10-K for a discussion of such transactions. For example, we are party to a services agreement with Third Security for which Third Security provides certain services to us in return for a monthly fee of shares of our common stock. We believe that each of these transactions was on terms no less favorable to us than terms we could have obtained from unaffiliated third parties, and each of these transactions was approved by at least a majority of the disinterested members of the audit committee of our board of directors. In addition, subsequent to our consummation of the ECCs with ZIOPHARM, Oragenics, Inc., or Oragenics, Synthetic Biologics, Inc., AmpliPhi Biosciences Corp., Soligenix, Inc., Agilis Biotherapeutics LLC, and OvaScience, Mr. Kirk and his affiliates invested in these companies. Furthermore, as we execute on these ECCs or JVs going forward, a conflict may arise between our interests and those of Mr. Kirk and his affiliates. It is our intention to ensure that all future transactions, if any, between us and our officers, directors, principal shareholders and their affiliates, are approved by the audit committee or a majority of the independent and disinterested members of the board of directors in accordance with our written related person transaction policy, and are on terms no less favorable to us than those that we could obtain from unaffiliated third parties.

As of December 31, 2015, Randal J. Kirk controlled approximately 53 percent of our common stock and is able to control or significantly influence corporate actions, which may result in Mr. Kirk taking actions contrary to the desires of our other shareholders.

We have historically been controlled, managed and principally funded by Randal J. Kirk, our Chief Executive Officer, and affiliates of Mr. Kirk. As of December 31, 2015, Mr. Kirk and shareholders affiliated with him beneficially owned approximately 53 percent of our voting stock. Mr. Kirk is able to control or significantly influence all matters requiring approval by our shareholders, including the election of directors and the approval of mergers or other business combination transactions. The interests of Mr. Kirk may not always coincide with the interests of other shareholders, and he may take actions that advance his personal interests and are contrary to the desires of our other shareholders.

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

Sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares of common stock intend to sell

shares, could reduce the market price of our common stock. If Mr. Kirk or any of his affiliates were to sell a substantial portion of the shares they hold, it could cause our stock price to decline.

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In addition, as of December 31, 2015, there were 11,043,528 shares subject to outstanding options that will become eligible for sale in the public market to the extent permitted by any applicable vesting requirements, lock-up agreements and Rules 144 and 701 under the Securities Act of 1933, as amended. Shares issuable upon the exercise of such options can be freely sold in the public market upon issuance and once vested.

We are subject to anti-takeover provisions in our articles of incorporation and bylaws and under Virginia law that could delay or prevent an acquisition of our Company, even if the acquisition would be beneficial to our shareholders.

Certain provisions of Virginia law, the commonwealth in which we are incorporated, and our articles of incorporation and bylaws could hamper a third party's acquisition of us, or discourage a third party from attempting to acquire control of us. These provisions include:

- a provision allowing our board of directors to issue preferred stock with rights senior to those of the common stock without any vote or action by the holders of our common stock. The issuance of preferred stock could adversely affect the rights and powers, including voting rights, of the holders of common stock;
- establish advance notice requirements for nominations for election to the board of directors or for proposing matters that can be acted on at shareholder meetings;
- the inability of shareholders to convene a shareholders' meeting without the support of shareholders owning together 25 percent of our common stock;
- the application of Virginia law prohibiting us from entering into a business combination with the beneficial owner of 10 percent or more of our outstanding voting stock for a period of three years after the 10 percent or greater owner first reached that level of stock ownership, unless we meet certain criteria;
- allow the authorized number of our directors to be changed only by resolution of our board of directors;
- limit the manner in which shareholders can remove directors from the board;
- require that shareholder actions must be effected at a duly called shareholder meeting and prohibit actions by our shareholders by written consent; and
- limit who may call a special meeting of shareholder meetings.

These provisions also could limit the price that certain investors might be willing to pay in the future for shares of our common stock. In addition, these provisions make it more difficult for our shareholders, should they choose to do so, to remove our board of directors or management.

If we fail to maintain an effective system of internal control over financial reporting, we may not be able to accurately report our financial results or prevent fraud. As a result, shareholders could lose confidence in our financial and other public reporting, which would harm our business and the trading price of our common stock.

Effective internal controls over financial reporting are necessary for us to provide reliable financial reports and, together with adequate disclosure controls and procedures, are designed to prevent fraud. Any failure to implement required new or improved controls, or difficulties encountered in their implementation could cause us to fail to meet our reporting obligations. In addition, any testing by us conducted in connection with Section 404 of the Sarbanes-Oxley Act, or any subsequent testing by our independent registered public accounting firm, may reveal deficiencies in our internal controls over financial reporting that are deemed to be material weaknesses or that may require prospective or retroactive changes to our financial statements or identify other areas for further attention or improvement. Inferior internal controls could also cause investors to lose confidence in our reported financial information, which could have a negative effect on the trading price of our common stock.

Item 1B. Unresolved Staff Comments

Not applicable.

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Item 2. Properties

We establish the geographic locations of our research and development operations based on proximity to the relevant market expertise and access to available talent pools. The following table shows information about our primary lab operations as of December 31, 2015:

Location	Square Footage
Germantown, MD	56,258
Davis, CA	40,000
South San Francisco, CA	29,409
San Diego, CA	23,409
Budapest, Hungary	17,978
Oxford, England	12,327
Ghent, Belgium	8,611
Campinas, Brazil	2,205

Our primary production facilities are located in Sioux Center, Iowa, and include approximately 235,000 square feet of production and office facilities and approximately 380 acres of land. The land and production facilities are primarily used for embryo transfer and in vitro fertilization processes, as well as housing livestock used in such processes. We also lease regional production facilities and land in Maryland, Missouri, Oklahoma and Texas for these purposes.

We lease an additional 33,000 square feet of administrative offices in West Palm Beach, Florida; Germantown, Maryland; and Blacksburg, Virginia. The original terms of our leases range from one to seven years. See also "Management's Discussion and Analysis of Financial Condition and Results of Operations — Contractual Obligations and Commitments."

Item 3. Legal Proceedings

We are involved in litigation or legal matters incidental to our business activities. While the outcome of these matters cannot be predicted with certainty, we are vigorously defending them and do not currently expect that any of them will have a material adverse effect on our business or financial position. However, should one or more of these matters be resolved in a manner adverse to our current expectation, the effect on our results of operations for a particular fiscal reporting period could be material.

Item 4. Mine Safety Disclosures

Not applicable.

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PART II

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

Market Information and Holders of Record

Our common stock trades on the NYSE under the symbol "XON". The following table sets forth for the periods indicated the high and low sales prices per share of our common stock as reported on the New York Stock Exchange:

	High	Low
Year Ended December 31, 2015		
Fourth Quarter	$43.76	$27.52
Third Quarter	69.45	28.39
Second Quarter	51.44	37.30
First Quarter	50.98	25.23
Year Ended December 31, 2014		
Fourth Quarter	$28.78	$16.13
Third Quarter	26.62	17.35
Second Quarter	26.60	13.13
First Quarter	38.50	22.53

As of February 15, 2016, we had 259 holders of record of our common stock. The actual number of shareholders is greater than this number of record holders and includes shareholders who are beneficial owners but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include shareholders whose shares may be held in trust by other entities.

Securities Authorized for Issuance Under Equity Compensation Plans

Information about our equity compensation plans is incorporated herein by reference to Item 12 of Part III of this Annual Report on Form 10-K.

Dividends

We have never declared or paid any cash dividends on our capital stock. We currently intend to retain earnings, if any, to finance the growth and development of our business. We do not expect to pay any cash dividends on our common stock in the foreseeable future. Payment of future dividends, if any, will be at the discretion of our board of directors and will depend on our financial condition, results of operations, capital requirements, restrictions contained in current or future financing instruments, provisions of applicable law and other factors that our board of directors deems relevant. However, in June 2015, we did distribute to our shareholders 17,830,305 shares of ZIOPHARM common stock, representing all of the equity interests of ZIOPHARM held by us. The distribution constituted a special stock dividend to shareholders of record as of June 4, 2015.

Stock Performance Graph

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

The following graph shows a comparison from August 8, 2013 (the date our common stock commenced trading on the New York Stock Exchange) through December 31, 2015 of the cumulative total return for our common stock, the Standard & Poor's 500 Stock Index (S&P 500 Index) and the NYSE MKT ARCA Biotechnology Index. The graph assumes that $100 was invested at the market close on August 8, 2013 in the common stock of Intrexon Corporation, the S&P 500 Index and the NYSE MKT ARCA Biotechnology Index and data for the S&P 500 Index and the NYSE MKT ARCA Biotechnology Index assumes reinvestments of dividends. The stock price performance of the following graph is not necessarily indicative of future stock price performance.

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Company / Index	Base Period 8/8/2013	9/30/2013	12/31/2013	3/31/2014	6/30/2014	9/30/2014	12/31/2014
Intrexon Corporation	$100.00	$95.79	$96.24	$106.31	$101.62	$75.13	$111.32
S&P 500 Index	100.00	99.38	109.82	111.81	117.66	118.99	124.86
NYSE MKT ARCA Biotechnology Index	100.00	103.12	110.29	122.45	131.51	146.60	163.14

Company / Index	3/31/2015	6/30/2015	9/30/2015	12/31/2015
Intrexon Corporation	$183.46	$198.01	$129.03	$122.34
S&P 500 Index	126.04	126.39	118.26	126.59
NYSE MKT ARCA Biotechnology Index	189.33	198.84	162.87	181.72

Recent Sales of Unregistered Securities and Use of Proceeds from Registered Securities

(a) Sales of Unregistered Securities

From January 1, 2015 through December 31, 2015, we consummated the following transactions involving the issuance of unregistered securities:

- the issuance of 307,074 unregistered shares of our common stock on February 24, 2015 in connection with our acquisition of all of the remaining equity interests in Exemplar as disclosed in our Annual Report on Form 10-K filed on March 2, 2015;

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- the issuance of 965,377 unregistered shares of our common stock on February 24, 2015 in connection with our acquisition of ActoGeniX as disclosed in our Annual Report on Form 10-K filed on March 2, 2015;
- the issuance of 2,100,085 unregistered shares of our common stock on March 11, 2015 in connection with our license, securities issuance and letter agreements with MD Anderson as disclosed in our Current Report on Form 8-K filed on January 14, 2015, as amended on January 28, 2015;
- the issuance of 707,853 unregistered shares of our common stock on April 17, 2015 to the shareholders of Okanagan in connection with our acquisition, pursuant to an Acquisition Agreement and Plan of Arrangement, of all of the outstanding equity of Okanagan as previously disclosed in our Quarterly Reports on Form 10-Q filed on May 11, 2015 and August 10, 2015;
- the issuance of 878,921 unregistered shares of our common stock on September 4, 2015 in connection with our acquisition of all of the outstanding equity of Oxitec as previously discussed in our Current Reports on Form 8-K filed on August 12, 2015 and September 8, 2015; and
- the issuance of 48,678 unregistered shares of our common stock in November and December 2015 as payment under the Services Agreement entered into and effective as of November 1, 2015, by and between us and Third Security as previously discussed in our Current Report on Form 8-K filed on October 30, 2015.

(b) Use of Proceeds

On August 7, 2013, our registration statement on Form S-1 (File No. 333-189853) was declared effective by the Securities and Exchange Commission for our initial public offering pursuant to which we sold an aggregate of 11,499,998 shares of our common stock (inclusive of 1,499,999 shares of common stock sold by us pursuant to the full exercise of an overallotment option granted to the underwriters in connection with the offering) at a price to the public of $16.00 per share for aggregate gross offering proceeds of approximately $184.0 million. J.P. Morgan Securities LLC and Barclays Capital Inc. acted as joint book-running managers. On August 13, 2013, we closed the sale of such shares, resulting in net proceeds to us of approximately $168.3 million after deducting underwriting discounts and commissions of approximately $12.9 million and other offering expenses of approximately $2.8 million. No payments were made by us to directors, officers or persons owning ten percent or more of our common stock or to their associates, or to our affiliates. We invested the funds received in cash equivalents and other short-term and long-term investments in accordance with our investment policy. There has been no material change in the planned use of proceeds from our initial public offering as described in our final prospectus, dated August 7, 2013, and filed with the Securities and Exchange Commission on August 8, 2013 pursuant to Rule 424(b).

On January 27, 2015, we closed a public offering of 4,312,500 shares of our common stock (inclusive of 562,500 shares of common stock sold by us pursuant to the full exercise of an option granted to the underwriters in connection with the offering) at a public offering price of $27.00 per share for aggregate gross offering proceeds of approximately $116.4 million. J.P. Morgan Securities LLC and Merrill Lynch, Pierce, Fenner & Smith Incorporate acted as joint book-running managers. Net proceeds to us were approximately $110.0 million after deducting underwriting discounts and commissions of approximately $6.1 million and other offering expenses of approximately $0.3 million. No payments were made by us to directors, officers or persons owning ten percent or more of our common stock or to their associates, or to our affiliates. We invested the funds received in cash equivalents and other short-term and long-term investments in accordance with our investment policy. There has been no material change in the planned use of proceeds from this offering as described in our final prospectus, dated January 21, 2015, and filed with the Securities and Exchange Commission on January 22, 2015 pursuant to Rule 424(b).

On August 26, 2015, we closed a public offering of 5,609,756 shares of our common stock (inclusive of 731,707 shares of common stock sold by us pursuant to the full exercise of an option granted to the underwriters in connection with the offering) at a public offering price of $41.00 per share for aggregate gross offering proceeds of approximately $230.0 million. JMP Securities LLC acted as sole book-running manager. Stifel, Nicolaus & Company, Incorporated acted as lead manager. Griffin Securities, Inc. and Wunderlich Securities, Inc. acted as co-managers. Net proceeds to us were approximately $218.2 million after deducting underwriting discounts and commissions of approximately $11.5 million and other offering expenses of approximately $0.3 million. No payments were made by us to directors, officers or persons owning ten percent or more of our common stock or to their associates, or to our affiliates. We invested the funds received in cash equivalents and other short-term and long-term investments in accordance with our

investment policy. There has been no material change in the planned use of proceeds from this offering as described in our final prospectus, dated August 21, 2015, and filed with the Securities and Exchange Commission on August 25, 2015 pursuant to Rule 424(b).

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(c) Issuer Purchases of Equity Securities

None.

Item 6. Selected Financial Data

The following table sets forth our selected consolidated financial data for the periods and as of the dates indicated. You should read the following selected consolidated financial data in conjunction with our audited consolidated financial statements and the related notes thereto included elsewhere in this Annual Report and the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of this Annual Report.

The selected consolidated financial data set forth below as of December 31, 2015 and 2014, and for the years ended December 31, 2015, 2014 and 2013, are derived from our audited consolidated financial statements included elsewhere in this report. The selected consolidated financial data set forth below as of December 31, 2013, 2012, and 2011, and for the years ended December 31, 2012 and 2011, are derived from our audited consolidated financial statements contained in reports previously filed with the SEC, not included herein. Our audited and unaudited consolidated financial statements have been prepared in U.S. dollars in accordance with generally accepted accounting principles in the United States, or U.S. GAAP.

Our historical results for any prior period are not necessarily indicative of results to be expected in any future period, and our results for any interim period are not necessarily indicative of results to be expected for a full fiscal year.

	Year Ended December 31,				
	2015	2014	2013	2012	2011
	(In thousands, except share and per share amounts)				
Statement of Operations Data:					
Collaboration and licensing revenues	$87,821	$45,212	$23,525	$13,706	$5,118
Product revenues	41,879	11,481	164	—	—
Service revenues	42,923	14,761	—	—	—
Total revenues	173,605	71,930	23,760	13,774	8,013
Total operating expenses	320,469	141,892	81,783	88,931	90,440
Operating loss	(146,864)	(69,962)	(58,023)	(75,157)	(82,427)
Net loss	(87,994)	(85,616)	(40,908)	(81,874)	(85,280)
Net loss attributable to noncontrolling interests	3,501	3,794	1,928	—	—
Net loss attributable to Intrexon	(84,493)	(81,822)	(38,980)	(81,874)	(85,280)
Accretion of dividends on redeemable convertible preferred stock	—	—	(18,391)	(21,994)	(13,868)
Net loss attributable to common shareholders	(84,493)	(81,822)	(57,371)	(103,868)	(99,148)
Net loss attributable to common shareholders per share, basic and diluted	$(0.76)	$(0.83)	$(1.40)	$(18.77)	$(18.92)
Weighted average shares outstanding, basic and diluted	111,066,352	99,170,653	40,951,952	5,533,690	5,240,647

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	December 31, 2015(5)	2014(4)	2013(3)	2012	2011(2)
	(In thousands)				
Balance Sheet Data:					
Cash and cash equivalents	$135,782	$27,466	$49,509	$10,403	$19,628
Short-term and long-term investments	207,975	115,608	188,561	260	258
Equity securities	83,653	164,889	141,525	83,116	39,097
Total assets	982,046	576,272	469,472	151,646	114,828
Deferred revenue, current and non-current	197,729	113,209	73,571	58,636	16,921
Other liabilities(1)	79,431	53,774	14,558	7,904	17,485
Redeemable convertible preferred stock	—	—	—	406,659	301,681
Total Intrexon shareholders' equity (deficit)	694,078	384,761	366,722	(321,553)	(221,259)
Noncontrolling interests	10,808	24,528	14,621	—	—
Total equity (deficit)	704,886	409,289	381,343	(321,553)	(221,259)

(1) Other liabilities include $8,528, $10,369 and $1,653 of long term debt as of December 31, 2015, 2014, and 2013, respectively; and $15,629 and $20,485 of deferred consideration as of December 31, 2015 and 2014, respectively.

(2) In 2011, we acquired Agarigen, Inc., Neugenesis Corporation, GT Life Sciences, Inc., and Immunologix, Inc. and began including the results of their operations effective on the respective acquisition dates.

(3) In 2013, we acquired ownership interests in AquaBounty and Biological & Popular Culture, Inc. which resulted in our gaining control over these entities, resulting in consolidation effective on the respective acquisition dates.

(4) In 2014, we acquired Medistem, Inc. and Trans Ova and began including the results of their operations effective on the respective acquisition dates.

(5) In 2015, we acquired ActoGeniX, Okanagan, and Oxitec and began including the results of their operations effective on the respective acquisition dates.

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

The following discussion and analysis of financial condition and results of operations is provided to enhance the understanding of, and should be read in conjunction with, Part I, Item 1, "Business" and Item 8, "Financial Statements and Supplementary Data." For information on risks and uncertainties related to our business that may make past performance not indicative of future results, or cause actual results to differ materially from any forward-looking statements, see "Special Note Regarding Forward-Looking Statements," and Part I, Item 1A, "Risk Factors."

Financial overview

We have incurred significant losses since our inception. We anticipate that we may continue to incur significant losses for the foreseeable future, and we may never achieve or maintain profitability. We have never generated any royalty revenues from sales of products by our collaborators and may never be profitable. Certain of our consolidated subsidiaries require regulatory approval and/or commercial scale-up before they may commence significant product sales and operating profits.

We expect our future capital requirements will be substantial, particularly as we continue to develop our business and expand our synthetic biology technology platform. We believe that our existing cash and cash equivalents, short-term and long-term investments, and cash expected to be received from our current collaborators and for sales of products and services provided by our consolidated subsidiaries will enable us to fund our operating expenses and capital expenditure requirements for at least the next 12 months.

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Sources of revenue

We derive our revenues through the execution of ECCs and license and collaboration agreements for the development and commercialization of products enabled by our technologies. Generally, the terms of these collaborations provide that we receive some or all of the following: (i) technology access fees upon signing; (ii) reimbursements of costs incurred by us for our research and development and/or manufacturing efforts related to specific applications provided for in the collaboration; (iii) milestone payments upon the achievement of specified development, regulatory and commercial activities; and (iv) royalties on sales of products arising from the collaboration.

Our technology access fees and milestone payments may be in the form of cash or securities of the collaborator. Our collaborations contain multiple arrangements and we typically defer revenues from the technology access fees and milestone payments received and recognize such revenues in the future over the anticipated performance period. We are also entitled to sublicensing revenues in those situations where our collaborators choose to license our technologies to other parties.

From time to time, we and certain collaborators may cancel the agreements, relieving us of any further performance obligations under the agreement. When no further performance obligations are required of us under an agreement, we recognize any remaining deferred revenue.

We also generate product and service revenues primarily through sales of advanced reproductive technologies, including bovine embryos derived from our embryo transfer and in vitro fertilization processes and from genetic preservation and sexed semen processes and applications of such processes to other livestock, as well as sales of livestock used in production. Revenue is recognized when (i) persuasive evidence of an arrangement exists, (ii) services have been rendered or delivery has occurred such that risk of loss has passed to the customer, (iii) the price is fixed or determinable, and (iv) collection from the customer is reasonably assured.

In future periods, our revenues will depend on the number of collaborations to which we are party, the advancement and creation of programs within our collaborations and the extent to which our collaborators bring products enabled by our technologies to market. Our revenues will also depend upon our ability to maintain or improve the volume and pricing of our current product and service offerings and to develop new offerings, including those arising from our recent acquisitions. Our revenues will also depend upon the ability of AquaBounty to establish successful commercialization of its AquAdvantage® Salmon products since it received regulatory approval in November 2015. Our future revenues may also include additional revenue streams we may acquire through mergers and acquisitions. In light of our limited operating history and experience in consummating new collaborations and also the limited experience with our consolidated subsidiaries, there can be no assurance as to the timing, magnitude and predictability of revenues to which we might be entitled.

Cost of products and services

Cost of products and services includes primarily labor and related costs, drugs and supplies used primarily in the embryo transfer and in vitro fertilization processes, livestock and feed used in production, and facility charges, including rent and depreciation. Fluctuations in the price of livestock and feed have not had a significant impact on our operating margins and no derivative financial instruments are used to mitigate the price risk.

Research and development expenses

We recognize research and development expenses as they are incurred. Our research and development expenses consist primarily of:

- salaries and benefits, including stock-based compensation expense, for personnel in research and development functions;
- fees paid to consultants and contract research organizations who perform research on our behalf and under our direction;
- costs related to laboratory supplies used in our research and development efforts;
- costs related to certain in-licensed technology rights, including the costs to acquire and maintain technologies we licensed from MD Anderson in 2015;
- depreciation of leasehold improvements and laboratory equipment;

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- amortization of patents and related technologies acquired in mergers and acquisitions; and
- rent and utility costs for our research and development facilities.

We have no individually significant research and development projects and our research and development expenses primarily relate to either the costs incurred to expand or otherwise improve our multiple platform technologies, the costs incurred to develop a specific application of our technologies in support of current or prospective collaborators, or costs incurred to expand or otherwise improve our products and services. Research and development expenses, including costs for preclinical and clinical development, incurred for programs we support pursuant to an ECC agreement are typically reimbursed by the collaborator at cost and all other research and development programs may be terminated or otherwise deferred at our discretion. The amount of our research and development expenses may be impacted by, among other things, the number of ECCs and the number and size of programs we may support on behalf of an ECC.

The table below summarizes our research and development expenses incurred to expand or otherwise improve our multiple platform technologies, the costs incurred to develop a specific application of our technologies in support of current or prospective collaborators and licensees, or costs incurred to expand or otherwise improve our products and services for the years ended December 31, 2015, 2014, and 2013. Other research and development expenses for these periods include indirect salaries and overhead expenses that are not allocated to either expanding or improving our multiple platform technologies, specific applications of our technologies in support of current or prospective collaborators and licensees, or expanding or improving our product and services offerings.

	Year Ended December 31,		
	2015	2014	2013
	(In thousands)		
Expansion or improvement of our platform technologies	$75,779	$13,858	$16,327
Specific applications of our technologies in support of current and prospective collaborators and licensees	41,306	26,643	21,688
Expansion or improvement of our product and service offerings	10,537	4,730	1,672
Other	19,861	13,752	8,456
Total research and development expenses	$147,483	$58,983	$48,143

We expect that our research and development expenses will increase as we continue to enter into collaborations and as we expand our offerings across additional market sectors. We believe these increases will likely include increased costs related to the hiring of additional personnel in research and development functions, increased costs paid to consultants and contract research organizations and increased costs related to laboratory supplies. Research and development expenses may also increase as a result of ongoing research and development operations which we might assume through mergers and acquisitions.

Selling, general and administrative expenses

Selling, general and administrative expenses consist primarily of salaries and related costs, including stock-based compensation expense, for employees in executive, operational, finance, sales and marketing, information technology, legal and corporate communications functions. Other significant selling, general and administrative expenses include rent and utilities, insurance, accounting and legal services and expenses associated with obtaining and maintaining our intellectual property.

We expect that our selling, general and administrative expenses will increase as we continue to operate as a public company and expand our operations. We believe that these increases will likely include costs related to the hiring of additional personnel and increased fees for business development functions, outside consultants, lawyers and accountants, including costs to comply with corporate governance, internal controls and similar requirements applicable to public companies. Selling, general and administrative expenses may also increase as a result of ongoing operations which we might assume through mergers and acquisitions.

Other income (expense), net

We hold equity securities received and/or purchased from certain collaborators. Other than investments accounted for using the equity method discussed below, we elected the fair value option to account for our equity securities held in these collaborators. These equity securities are recorded at fair value at each reporting date. Unrealized appreciation

(depreciation) resulting from fair value adjustments are reported as other income (expense) in the consolidated statement of operations. As such, we bear the

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risk that fluctuations in the securities' share prices may significantly impact our results of operations. In June 2015, we recorded a realized gain related to the distribution of all our shares of ZIOPHARM to our shareholders as a special stock dividend.

Interest income consists of interest earned on our cash and cash equivalents and short-term and long-term investments.

Interest expense pertains to deferred consideration payable to the former members of Trans Ova and long term debt.

As consideration for providing exclusive rights of first-look and first negotiation, we receive a portion of the management fee collected by the fund sponsor of Harvest for our obligation to provide Harvest with investment proposals that are suitable for pursuit by a start-up. These fees are included in other income.

Equity in net income (loss) of affiliates

Equity in net income or loss of affiliates is our pro-rata share of our equity method investments' operating results, adjusted for accretion of basis difference. We have accounted for investments in our joint ventures and start-up entities backed by Harvest using the equity method of accounting since we have the ability to exercise significant influence, but not control, over the operating activities of these entities.

Results of operations

Comparison of the year ended December 31, 2015 to the year ended December 31, 2014

The following table summarizes our results of operations for the years ended December 31, 2015 and 2014, together with the changes in those items in dollars and as a percentage:

	Year Ended December 31, 2015	2014	Dollar Change	Percent Change	
	(In thousands)				
Revenues					
Collaboration and licensing revenues	$87,821	$45,212	$42,609	94.2	%
Product revenues	41,879	11,481	30,398	>200%	
Service revenues	42,923	14,761	28,162	190.8	%
Other revenues	982	476	506	106.3	%
Total revenues	173,605	71,930	101,675	141.4	%
Operating expenses					
Cost of products	40,746	11,035	29,711	>200%	
Cost of services	23,183	8,225	14,958	181.9	%
Research and development	147,483	58,983	88,500	150.0	%
Selling, general and administrative	109,057	63,649	45,408	71.3	%
Total operating expenses	320,469	141,892	178,577	125.9	%
Operating loss	(146,864)	(69,962)	(76,902)	109.9	%
Total other income (expense), net	68,830	(10,497)	79,327	>200%	
Equity in loss of affiliates	(8,944)	(5,260)	(3,684)	70.0	%
Loss before income taxes	(86,978)	(85,719)	(1,259)	1.5	%
Income tax benefit (expense)	(1,016)	103	(1,119)	<(200)%	
Net loss	(87,994)	(85,616)	(2,378)	2.8	%
Net loss attributable to noncontrolling interests	3,501	3,794	(293)	(7.7	)%
Net loss attributable to Intrexon	$(84,493)	$(81,822)	$(2,671)	3.3	%

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Collaboration and licensing revenues

The following table shows the collaboration and licensing revenue recognized for the years ended December 31, 2015 and 2014, together with the changes in those items. See Note 5 to our consolidated financial statements appearing elsewhere in this annual report on Form 10-K for further discussion of our collaboration and licensing revenues.

	Year Ended December 31,		Dollar Change
	2015	2014	
	(In thousands)		
Ares Trading S.A.	$4,728	$—	$4,728
ZIOPHARM Oncology, Inc.	19,306	14,621	4,685
Oragenics, Inc.	6,535	1,643	4,892
Fibrocell Science, Inc.	12,179	6,192	5,987
Genopaver, LLC	3,829	1,783	2,046
S & I Ophthalmic, LLC	4,115	2,832	1,283
OvaXon, LLC	2,540	2,799	(259)
Intrexon Energy Partners, LLC	13,447	6,102	7,345
Persea Bio, LLC	1,241	—	1,241
Thrive Agrobiotics, Inc.	266	—	266
Intrexon Energy Partners II, LLC	167	—	167
Other	19,468	9,240	10,228
Total	$87,821	$45,212	$42,609

Collaboration and licensing revenues increased $42.6 million over the year ended December 31, 2014 due to (i) the recognition of deferred revenue for upfront payments received from our license and collaboration agreement with Ares Trading, a subsidiary of the biopharmaceutical business of Merck KGaA, which became effective in May 2015, and from other collaborations signed by us in 2015; (ii) increased research and development services performed for both new collaborations and for the expansion or addition of new programs with previously existing collaborators, including primarily ZIOPHARM, Fibrocell Science, Inc., Genopaver, LLC, and Intrexon Energy Partners; and (iii) the recognition of $16.0 million of previously deferred revenue related to collaboration agreements for which we satisfied all of our obligations or which were terminated in 2015.

Product and service revenues and cost of products and services

Product and service revenues were $84.8 million for the year ended December 31, 2015 compared to $26.2 million for the year ended December 31, 2014, an increase of $58.6 million or 224 percent. Product revenue primarily includes the sale of pregnant cows, live calves and livestock used in production and service revenue primarily includes the provision of in vitro fertilization and embryo transfer services. Cost of products and services were $63.9 million for the year ended December 31, 2015 compared to $19.3 million for the year ended December 31, 2014. Costs of products and services primarily consist of employee compensation costs, livestock, feed, drug supplies, recipient costs and facility charges related to the production of such products and services. These increases relate primarily to the inclusion of a full year of results for Trans Ova in 2015 versus approximately four and a half months of results in 2014 since the acquisition occurred in August 2014.

Research and development expenses

Research and development expenses were $147.5 million for the year ended December 31, 2015 compared to $59.0 million for the year ended December 31, 2014, an increase of $88.5 million, or 150 percent. In January 2015, we issued 2,100,085 shares of our common stock valued at $59.6 million to MD Anderson, in exchange for an exclusive license to certain technologies owned by MD Anderson. Salaries, benefits and other personnel costs increased $12.5 million due to (i) an increase in research and development headcount to support new and expanded collaborations, as well as additional compensation expenses related to stock options and performance-based bonus awards for all research and development employees; and (ii) increased headcount from our 2015 acquisitions. Lab supplies and contract research organizations expenses increased $8.2 million as a result of (i) the progression into the preclinical phase with certain of our collaborators; (ii) the increased level of research and development services provided to our

collaborators; and (iii) costs incurred by our 2015 acquisitions. Depreciation and

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amortization increased $4.0 million primarily as a result of acquiring property and equipment and intangible assets in connection with our 2015 acquisitions.

Selling, general and administrative expenses

Selling, general and administrative expenses were $109.1 million for the year ended December 31, 2015 compared to $63.6 million for the year ended December 31, 2014, an increase of $45.5 million or 72 percent. Salaries, benefits and other personnel costs increased $28.0 million due to (i) the inclusion of selling, general and administrative employees of Trans Ova for a full year in 2015 compared to approximately four and a half months in 2014; (ii) increased headcount to support our expanding operations, as well as additional compensation expenses related to stock options and performance-based bonus awards, including those paid under our 2015 annual executive bonus plan, for all selling, general and administrative employees; and (iii) salaries, benefits and other personnel costs from our 2015 acquisitions. Legal and professional expenses increased $7.0 million primarily due to costs associated with our 2015 acquisitions, the license agreement with MD Anderson, a full year of legal and professional costs for Trans Ova, our 2015 public offerings, and other business development activity. Other selling, general and administrative expenses, including rent and utilities, and depreciation and amortization, have increased in 2015 as a result of our expanding operations, a full year of Trans Ova expenses, and expenses from our 2015 acquisitions.

Total other income (expense), net

Total other income (expense), net, was $68.8 million for the year ended December 31, 2015 compared to $(10.5) million for the year ended December 31, 2014, an increase of $79.3 million. This increase was primarily related to the $81.4 million realized gain recognized upon the special stock dividend of all of our shares of ZIOPHARM to our shareholders in June 2015 which was partially offset by unrealized depreciation in fair value of our other publicly traded equity securities of $14.5 million for the year ended December 31, 2015.

Equity in net loss of affiliates

Equity in net loss of affiliates for the years ended December 31, 2015 and 2014 includes our pro-rata share of the net losses of our investments we account for by the equity method of accounting. The $3.7 million increase in equity in net loss of affiliates is primarily due to higher net losses incurred by Intrexon Energy Partners in 2015. Intrexon Energy Partners incurred a full year of losses in 2015 at a higher spend rate due to the program progression compared to only nine months in 2014 when the program was scaling up.

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Comparison of the year ended December 31, 2014 to the year ended December 31, 2013

The following table summarizes our results of operations for the years ended December 31, 2014 and 2013, together with the changes in those items in dollars and as a percentage:

	Year Ended December 31, 2014	2013	Dollar Change	Percent Change
	(In thousands)			
Revenues				
Collaboration and licensing revenues	$45,212	$23,525	$21,687	92.2 %
Product revenues	11,481	164	11,317	>200%
Service revenues	14,761	—	14,761	N/A
Other revenues	476	71	405	>200%
Total revenues	71,930	23,760	48,170	>200%
Operating expenses				
Cost of products	11,035	22	11,013	>200%
Cost of services	8,225	—	8,225	N/A
Research and development	58,983	48,143	10,840	22.5 %
Selling, general and administrative	63,649	33,618	30,031	89.3 %
Total operating expenses	141,892	81,783	60,109	73.5 %
Operating loss	(69,962)	(58,023)	(11,939)	20.6 %
Total other income (expense), net	(10,497)	17,721	(28,218)	(159.2)%
Equity in loss of affiliates	(5,260)	(606)	(4,654)	>200%
Loss before income taxes	(85,719)	(40,908)	(44,811)	109.5 %
Income tax benefit	103	—	103	N/A
Net loss	(85,616)	(40,908)	(44,708)	109.3 %
Net loss attributable to noncontrolling interests	3,794	1,928	1,866	96.8 %
Net loss attributable to Intrexon	$(81,822)	$(38,980)	$(42,842)	109.9 %

Collaboration and licensing revenues

The following table shows the collaboration and licensing revenue recognized for the years ended December 31, 2014 and 2013, together with the changes in those items. See Note 5 to our consolidated financial statements appearing elsewhere in this annual report on Form 10-K for further discussion of our collaboration and licensing revenues.

	Year Ended December 31, 2014	2013	Dollar Change
	(In thousands)		
ZIOPHARM Oncology, Inc.	$14,621	$10,395	$4,226
Oragenics, Inc.	1,643	2,190	(547)
Fibrocell Science, Inc.	6,192	4,706	1,486
Genopaver, LLC	1,783	1,139	644
S & I Ophthalmic, LLC	2,832	417	2,415
OvaXon, LLC	2,799	—	2,799
Intrexon Energy Partners, LLC	6,102	—	6,102
Other	9,240	4,678	4,562
Total	$45,212	$23,525	$21,687

Collaboration and licensing revenues increased $21.7 million over the year ended December 31, 2014 due to (i) the recognition of deferred revenue for upfront payments received from collaborations or expansions thereof signed by us in 2014, including

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Intrexon Energy Partners, a joint venture in which we own 50 percent, (ii) the recognition of research and development services performed by us pursuant to these new collaborations, and (iii) increased research and development services performed by us for collaborations in effect prior to 2014 as a result of the progression of current programs and initiation of new programs with the collaborations, including ZIOPHARM and our joint ventures with S & I Ophthalmic and OvaXon.

Product and service revenues and cost of products and services

Product revenue includes $10.3 million from the sale of pregnant cows, live calves and livestock used in production. Service revenue totaling $11.7 million relates to the provision of in vitro fertilization and embryo transfer services performed. Cost of products and services were $18.9 million which primarily consist of employee compensation costs, livestock, feed, drug supplies and facility charges related to the production of such products and services.

Research and development expenses

Research and development expenses were $59.0 million for the year ended December 31, 2014 compared to $48.1 million for the year ended December 31, 2013, an increase of $10.9 million, or 22.5 percent. Salaries, benefits and other personnel costs increased $6.5 million due primarily to (i) increases in research and development headcount to support the new collaborations, (ii) stock-based compensation expenses for stock options granted to research and development employees in March 2014, and (iii) the inclusion of a full year of compensation costs for AquaBounty employees in 2014 compared to approximately nine and a half months in 2013. Lab supplies and contract research organizations expenses increased $4.0 million as a result of the increased level of research and development services provided to our collaborators. Depreciation and amortization increased $1.1 million as a result of equipment purchased to support the increase in collaborations and the amortization of intangibles arising from the acquisition of Trans Ova. These increases were partially offset by a $1.2 million decrease in third party maintenance fees related to the termination of an exclusive licensing agreement in May 2014.

Selling, general and administrative expenses

Selling, general and administrative expenses were $63.6 million for the year ended December 31, 2014 compared to $33.6 million for the year ended December 31, 2013, an increase of $30.0 million or 89.3 percent. Salaries, benefits and other personnel costs increased $20.0 million due to (i) our hiring additional employees needed to operate as a public company, (ii) the inclusion of Trans Ova employees since the date of acquisition, (iii) stock-based compensation expenses for stock options granted to general and administrative employees in March 2014, and (iv) the inclusion of a full year of costs for AquaBounty employees in 2014 compared to nine and a half months in 2013. Stock-based compensation expenses for options granted to our non-employee directors increased $1.9 million due to changes in our director compensation plan which we adopted in conjunction with our transition to a public company. Legal and professional expenses increased $4.4 million primarily due to costs associated with merger and acquisition and other business development activities, the formation of our joint venture with Intrexon Energy Partners, and legal costs incurred by AquaBounty and Trans Ova.

Total other income (expense), net

Total other income (expense), net, is primarily comprised of unrealized appreciation (depreciation) in fair value of equity securities which was $(10.5) million for the year ended December 31, 2014 compared to $10.4 million for the year ended December 31, 2013. The unrealized appreciation (depreciation) is the result of market change for the equity securities we hold in certain of our collaborators. Total other income (expense), net, for the year ended December 31, 2013 includes a $7.4 million gain on our previously held equity interest in AquaBounty triggered by the requirement to consolidate AquaBounty in March 2013.

Equity in net loss of affiliates

Equity in net loss of affiliates for the years ended December 31, 2014 and 2013 includes our pro-rata share of the net losses of our investments we account for by the equity method of accounting. The $4.7 million increase in net loss of affiliates is due to (i) a full year of net losses at S & I Ophthalmic in 2014 compared to three months in 2013, (ii) net losses incurred by OvaXon after commencing significant activities in January 2014, and (iii) net losses incurred after the formation of Intrexon Energy Partners in March 2014.

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Liquidity and capital resources

Sources of liquidity

We have incurred losses from operations since our inception and as of December 31, 2015, we had an accumulated deficit of $542.7 million. From our inception through December 31, 2015, we have funded our operations principally with proceeds received from private and public offerings, cash received from our collaborators and through product and service sales made directly to customers. As of December 31, 2015, we had cash and cash equivalents of $135.8 million and short-term and long-term investments of $208.0 million. Cash in excess of immediate requirements is invested primarily in money market funds, certificates of deposits and U.S. government debt securities in order to maintain liquidity and preserve capital.

We currently generate cash receipts primarily from technology access fees, reimbursement of research and development services performed by us and sales of products and services.

Cash flows

The following table sets forth the significant sources and uses of cash for the periods set forth below:

	Year Ended December 31,		
	2015	2014	2013
	(In thousands)		
Net cash provided by (used in):			
Operating activities	$35,669	$(19,858)	$(53,683)
Investing activities	(260,811)	(26,029)	(223,663)
Financing activities	333,249	24,004	316,451
Effect of exchange rate changes on cash and cash equivalents	209	(160)	1
Net increase (decrease) in cash and cash equivalents	$108,316	$(22,043)	$39,106

Cash flows from operating activities:

Net cash provided by operating activities was $35.7 million during the year ended December 31, 2015 compared to $19.9 million net cash used in operating activities for the year ended December 31, 2014. During the year ended December 31, 2015, we received net cash receipts for technology access fees of $85.5 million pursuant to new collaborations with Ares Trading, ZIOPHARM, and Intrexon Energy Partners II. Our net loss of $88.0 million, after deduction of noncash items of (i) $59.6 million of common stock issued to MD Anderson for the in-license of certain technologies, (ii) $38.7 million of stock-based compensation expense and (iii) $17.7 million of depreciation and amortization expense and the addition of $66.9 million of noncash unrealized and realized gains on our equity securities was $38.9 million. Net cash used in operating activities of $19.9 million during the year ended December 31, 2014 resulted from our $85.6 million net loss, which, after deduction of noncash items of (i) $10.5 million of unrealized depreciation on our equity securities, (ii) $21.8 million of stock-based compensation expense and (iii) $10.4 million of depreciation and amortization expense was $42.9 million. This amount was partially offset by the receipt of a $25.0 million technology access fee from our ECC with Intrexon Energy Partners. Net cash used in operating activities of $53.7 million during the year ended December 31, 2013 resulted from our $40.9 million net loss and noncash items which primarily included (i) our unrealized appreciation on equity securities of $10.4 million and (ii) our $7.4 million gain on our previously held equity interest in AquaBounty.

Cash flows from investing activities:

Net cash used in investing activities was $260.8 million for the year ended December 31, 2015 compared to $26.0 million for the year ended December 31, 2014. During 2015, we used $123.9 million, net of cash received, for the acquisitions of ActoGeniX, Okanagan and Oxitec; $93.6 million for net purchases of short-term and long-term investments; $17.1 million for the purchase of equity securities and warrants pursuant to public financings by three of our collaborators; $13.4 million for investments in our joint ventures, and $12.7 million for purchases of property, plant and equipment. During 2014, we received net proceeds from the maturity and sale of short-term and long-term investments of $71.6 million. These net proceeds were offset by net cash outflows of $67.6 million for the acquisitions of Trans Ova and Medistem, Inc., the purchase of $19.5 million common stock from one of our collaborators and $6.4 million in purchases of property, plant and equipment. Net cash used in investing activities was $223.7 million for the year ended December 31, 2013. During 2013, we invested cash received from our Series F financing and our IPO to

purchase $234.0 million of U.S. government debt securities, commercial paper and

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certificates of deposit and used $28.7 million to purchase shares of common stock of certain of our collaborators. These cash outflows were offset by $45.0 million received upon the maturation of short-term investments in 2013.

Cash flows from financing activities:

Net cash provided by financing activities was $333.2 million for the year ended December 31, 2015 compared to $24.0 million for the year ended December 31, 2014. During 2015, we received $328.2 million of net proceeds from our public offerings in January and August. During 2014, we received $25.0 million of proceeds from the private placement of our common stock which closed in March 2014 and $1.5 million of proceeds from stock option exercises. These cash inflows were offset by $1.8 million of net payments on lines of credit used by Trans Ova. Net cash provided by financing activities was $316.5 million for the year ended December 31, 2013. During 2013, we received $146.9 million of net proceeds from the sale of our Series F Preferred Stock and $168.8 million of net proceeds from our IPO.

Future capital requirements

We established our current strategy and business model of commercializing our technologies through collaborations with development expertise in 2010 and we consummated our first collaboration in January 2011. We believe that we will continue to consummate collaborations with new companies across our various market sectors, which will result in additional upfront, milestone and cost recovery payments in the future.

We believe that our existing cash and cash equivalents and short-term and long-term investments and cash expected to be received from our current collaborators and for sales of products and services provided by our consolidated subsidiaries will enable us to fund our operating expenses and capital expenditure requirements for at least the next 12 months.

We have based our estimates on assumptions that may prove to be wrong, and we may use our available capital resources sooner than we currently expect. Our future capital requirements will depend on many factors, including:

- progress in our research and development programs, as well as the magnitude of these programs;
- the timing, receipt and amount of upfront, milestone and other payments, if any, from present and future collaborators, if any;
- the timing, receipt and amount of sales and royalties, if any, from our potential products;
- our ability to maintain or improve the volume and pricing of our current product and service offerings and to develop new offerings, including those which may incorporate new technologies;
- the timing, receipt and amount of funding under future government contracts, if any;
- our ability to maintain and establish additional collaborative arrangements and/or new business initiatives;
- the timing of regulatory approval of products of our collaborations and operations;
- the resources, time and cost required for the preparation, filing, prosecution, maintenance and enforcement of patent claims;
- investments we may make in current and future collaborators, including joint ventures;
- strategic mergers and acquisitions, including both the upfront acquisition cost as well as the cost to integrate, maintain, and expand the strategic target; and
- the costs associated with legal activities, including litigation, arising in the course of our business activities and our ability to prevail in any such legal disputes.

Until such time, if ever, as we can regularly generate positive operating cash flows, we may finance our cash needs through a combination of equity offerings, debt financings, government or other third-party funding, strategic alliances and licensing arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interests of our common shareholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our common shareholders. Debt financing, if available, may involve

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agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through government or other third-party funding, marketing and distribution arrangements or other collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us.

Contractual obligations and commitments

The following table summarizes our significant contractual obligations and commitments at December 31, 2015 and the effects such obligations are expected to have on our liquidity and cash flows in future periods:

	Total	Less Than 1 Year	1-3 Years	3-5 Years	More Than 5 Years
	(In thousands)				
Operating leases	$16,207	$4,136	$6,154	$4,311	$1,606
Deferred consideration	15,629	6,931	8,698	—	—
Long term debt	6,721	930	909	652	4,230
Total	$38,557	$11,997	$15,761	$4,963	$5,836

In addition to the obligations in the table above, as of December 31, 2015 we also have the following significant contractual obligations described below.

In conjunction with the formation of our joint ventures, we committed to making future capital contributions of at least $35.0 million to the joint ventures, subject to certain conditions and limitations. As of December 31, 2015, our remaining capital contribution commitments to our joint ventures were $28.7 million. These future capital contributions are not included in the table above due to the uncertainty of the timing and amounts of such contributions.

We are also party to in-licensed research and development agreements with various academic and commercial institutions where we could be required to make future payments for annual maintenance fees as well as for milestones and royalties we might receive upon commercial sales of products which incorporate their technologies. These agreements are generally subject to termination by us and therefore no amounts are included in the tables above. At December 31, 2015, we had research and development commitments with third parties totaling $4.1 million that had not yet been incurred.

In June 2015, we and Oragenics entered into an ECC. In conjunction with this ECC, we agreed to purchase additional common stock in a qualified financing, as defined in the agreement, during the sixteen months following the effective date of the ECC in an amount up to the lesser of (i) the amount that is the proportion of such financing equal to our pro rata equity holdings in Oragenics as of the effective date and (ii) $10 million, subject to certain conditions. This amount is not included in the table above due to the uncertainty of when or if we will make this payment.

In January 2015, we and ZIOPHARM jointly entered into a license agreement with MD Anderson whereby we received an exclusive license to certain technologies owned by MD Anderson. ZIOPHARM will receive access to these technologies pursuant to the terms of our ECC. We and ZIOPHARM are obligated to reimburse MD Anderson for out of pocket expenses for maintaining patents covering the licensed technologies. These reimbursements are not included in the table above due to the uncertainty of the timing and amounts of such reimbursements.

In August 2014, we acquired all of the membership interests of Trans Ova and agreed to pay a portion of certain cash proceeds in the event there is an award under certain litigation matters pending as of closing to which Trans Ova is a party. These amounts are not included in the table above due to the uncertainty of whether any amounts may be due.

In conjunction with a prior transaction associated with Trans Ova's subsidiary, ViaGen, in September 2012, we may be obligated to make certain future contingent payments to the former equity holders of ViaGen, up to a total of $5.0 million if certain revenue targets, as defined in the share purchase agreement, are met. This amount is not included in the table above due to the uncertainty of when we will make any of these future payments, if ever.

We acquired 100 percent of the outstanding capital stock of Immunologix, Inc., or Immunologix, in October 2011. The transaction included a contingent consideration arrangement which may require us to pay the selling shareholders 50 percent, subject to a maximum of $2.0 million, of revenue generated from Immunologix's technology applied

towards a specific target

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as defined in the agreement up to a maximum of $2.0 million. This amount is not included in the table above due to the uncertainty of whether, if ever, we will pay this contingent consideration.

In January 2009, AquaBounty was awarded a grant to provide funding of a research and development project from the Atlantic Canada Opportunities Agency, a Canadian government agency. Amounts claimed by AquaBounty must be repaid in the form of a 10 percent royalty on any products commercialized out of this research and development project until fully paid. Because the timing of commercialization is subject to additional regulatory considerations, the timing of repayment is uncertain. AquaBounty has claimed all amounts available under the grant, resulting in total long-term debt of $1.8 million on our consolidated financial statements as of December 31, 2015. This amount is not included in the table above due to the uncertainty of the timing of repayment.

Net operating losses

As of December 31, 2015, we had net operating loss carryforwards of approximately $248.7 million for U.S. federal income tax purposes available to offset future taxable income and U.S. federal and state research and development tax credits of $6.8 million, prior to consideration of annual limitations that may be imposed under Section 382. These carryforwards begin to expire in 2022. Our direct foreign subsidiaries have foreign loss carryforwards of approximately $109.7 million, most of which do not expire.

Our past issuances of stock and mergers and acquisitions have resulted in ownership changes within the meaning of Section 382. As a result, the utilization of portions of our net operating losses may be subject to annual limitations. As of December 31, 2015, approximately $16.4 million of our domestic net operating losses generated prior to 2008 are limited by Section 382 to annual usage limits of approximately $1.5 million. As of December 31, 2015, approximately $19.1 million of domestic net operating losses were inherited via acquisition and are limited based on the value of the target at the time of the transaction. Future changes in stock ownership may also trigger an ownership change and, consequently, a Section 382 limitation.

We do not file a consolidated income tax return with AquaBounty and BioPop. As of December 31, 2015, AquaBounty had loss carryforwards for federal and foreign income tax purposes of approximately $17.1 million and $10.9 million, respectively, and foreign research tax credits of $2.2 million available to offset future taxable income, prior to consideration of annual limitations that may be imposed under Section 382 or analogous foreign provisions. These carryforwards will begin to expire in 2018. As a result of our ownership in AquaBounty passing 50 percent in 2013, an annual Section 382 limitation of approximately $0.9 million per year will apply to losses and credits carried forward by AquaBounty from prior years, which are also subject to Section 382 limitations. As of December 31, 2015, BioPop had loss carryforwards of approximately $1.4 million for federal income tax purposes available to offset future taxable income.

Off-balance sheet arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, other than operating leases as mentioned above, as defined under Securities and Exchange Commission, or SEC, rules.

Critical accounting policies and estimates

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

While our significant accounting policies are more fully described in Note 2 to our consolidated financial statements appearing elsewhere in this annual report on Form 10-K, we believe that the following accounting policies are the most critical for fully understanding and evaluating our financial condition and results of operations.

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Revenue recognition

We generate revenue through contractual agreements with collaborators and licensing agreements whereby the collaborators or the licensees obtain exclusive access to our proprietary technologies for use in the research, development and commercialization of products and/or treatments in a contractually specified field of use. Generally, the terms of these agreements provide that we receive some or all of the following: (i) upfront payments upon consummation of the agreement; (ii) reimbursements for costs incurred by us for research and development and/or manufacturing efforts related to specific applications provided for in the agreement; (iii) milestone payments upon the achievement of specified development, regulatory and commercial activities; and (iv) royalties on sales of products arising from the collaboration or licensing agreement.

Our collaborations and licensing agreements typically contain multiple elements, or deliverables, including technology licenses, research and development services, and in certain cases manufacturing services. We identify the deliverables within the agreements and evaluate which deliverables represent separate units of accounting. Analyzing the agreements to identify deliverables requires the use of judgment. A deliverable is considered a separate unit of accounting when the deliverable has value to the collaborator or licensee on a standalone basis based on the consideration of the relevant facts and circumstances for each agreement.

Consideration received is allocated at the inception of the agreement to all identified units of accounting based on their relative selling price. When available, the relative selling price for each deliverable is determined using vendor specific objective evidence, or VSOE, of the selling price or third-party evidence of the selling price, if VSOE does not exist. If neither VSOE nor third-party evidence of the selling price exists, we use our best estimate of the selling price for the deliverable. The amount of allocable consideration is limited to amounts that are fixed or determinable. The consideration received is allocated among the separate units of accounting, and the applicable revenue recognition criteria are applied to each of the separate units. We recognize the revenue allocated to each unit of accounting as we deliver the related goods or services. If we determine that certain deliverables should be treated as a single unit of accounting, then the revenue is recognized using either a proportional performance or straight-line method, depending on whether we can reasonably estimate the level of effort required to complete our performance obligations under an arrangement and whether such performance obligations are provided on a best-efforts basis. As we cannot reasonably estimate our performance obligations related to our collaborations, we recognize revenue on a straight-line basis over the period we expect to complete our performance obligations.

The terms of our agreements may provide for milestone payments upon achievement of certain defined events. We apply the Milestone Method for recognizing milestone payments. Under the Milestone Method, we recognize consideration that is contingent upon the achievement of a milestone in its entirety as revenue in the period in which the milestone is achieved only if the milestone is substantive in its entirety. A milestone is considered substantive when it meets all of the following criteria:

- The consideration is commensurate with either the entity's performance to achieve the milestone or the enhancement of the value of the delivered item or items as a result of a specific outcome resulting from the entity's performance to achieve the milestone;
- The consideration relates solely to past performance; and
- The consideration is reasonable relative to all of the deliverables and payment terms within the arrangement.

In the event that a milestone is not considered substantive, we recognize the milestone consideration as revenue using the same method applied to the upfront payments.

Research and development services are a deliverable satisfied by us in accordance with the terms of the collaboration and licensing agreements and we consider these services to be inseparable from the license to the core technology; therefore, reimbursements of services performed are recognized as revenue. Because reimbursement (i) is contingent upon performance of the services by us, (ii) does not include a profit component and (iii) does not relate to any future deliverable, the revenue is recognized during the period in which the related services are performed and collection of such amounts is reasonably assured. Payments received for manufacturing services will be recognized when the earnings process related to the manufactured materials has been completed. Royalties to be received under the agreements will be recognized as earned.

From time to time, we and certain collaborators may cancel the agreements, relieving us of any further performance obligations under the agreement. When no further performance obligations are required of us under an agreement, we recognize any remaining deferred revenue.

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We recognized $87.8 million, $45.2 million and $23.5 million of collaboration and licensing revenues in the years ended December 31, 2015, 2014 and 2013, respectively. As of December 31, 2015 and 2014, we have $181.3 million and $107.2 million, respectively, of deferred revenue related to our receipt of upfront and milestone payments.

We also generate product and service revenues through sales of advanced reproductive technologies, including bovine embryos derived from our embryo transfer and in vitro fertilization processes and from genetic preservation and sexed semen processes and applications of such processes to other livestock, as well as sales of livestock used in production. Revenue is recognized when (i) persuasive evidence of an arrangement exists, (ii) services have been rendered or delivery has occurred such that risk of loss has passed to the customer, (iii) the price is fixed or determinable, and (iv) collection from the customer is reasonably assured. We recognized $83.4 million and $25.9 million of these product and service revenues for the years ended December 31, 2015 and 2014, respectively.

Valuation of investments in equity securities

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset and liability. We use a three-tier fair value hierarchy to prioritize the inputs used in our fair value measurements. These tiers include: Level 1, defined as observable inputs such as quoted prices in active markets for identical assets and liabilities, which includes our cash equivalents and certain investments in equity securities of our publicly held collaborators; Level 2, defined as inputs other than quoted prices included in Level 1 that are observable for the asset or liability either directly or indirectly, which includes our short-term and long-term investments and certain investments in equity securities of our publicly held collaborators; and Level 3, defined as unobservable inputs for the asset or liability used to measure fair value to the extent that observable inputs are not available.

We hold equity securities received and/or purchased from certain collaborators. For each collaborator where we own equity securities, we make an accounting policy election to present them either (i) at the fair value at the end of each reporting period or (ii) using the cost or equity method depending on our level of influence. Other than investments accounted for using the equity method, we have elected to account for certain of these equity securities in publicly held collaborators using the fair value option. These equity securities in publicly held collaborators are recorded at fair value at each reporting date and are subject to market price volatility. Unrealized gains and losses resulting from fair value adjustments are reported as other income (expense) in the consolidated statement of operations. The fair value of these equity securities in publicly held collaborators is subject to fluctuation in the future due to the volatility of the stock market, changes in general economic conditions and changes in the financial conditions of these collaborators. As of December 31, 2015 and 2014, our equity securities in our collaborators are valued at $83.7 million and $164.9 million, respectively.

We record the fair value of securities received on the date the collaboration is consummated or the milestone is achieved using the closing, quoted price of the collaborator's security on that date, assuming the transfer of the consideration is considered perfunctory. If the transfer of the consideration is not considered perfunctory, we consider the specific facts and circumstances to determine the appropriate date on which to evaluate fair value. We also evaluate whether any discounts for trading restrictions or other basis for lack of marketability should be applied to the fair value of the securities at inception of the collaboration. In the event we conclude that a discount should be applied, the fair value of the securities is adjusted at inception of the collaboration and re-evaluated at each reporting period thereafter.

We account for investments in which we have the ability to exercise significant influence over, but not control, the operating activities of the investee using the equity method or election of the fair value option. If the fair value option is elected, the investment is accounted for as described for equity securities above. Under the equity method, we include our pro-rata share of the investee's operating results, adjusted for accretion of basis difference, in our consolidated statement of operations with the corresponding increase or decrease applied to the carrying value of the investment. We account for investments in our joint ventures and start-up entities backed by Harvest using the equity method of accounting since we have the ability to exercise significant influence, but not control, over the operating activities of these entities.

Valuation allowance for net deferred tax assets

We record a valuation allowance to offset any net deferred tax assets if, based upon the available evidence, it is more likely than not that we will not recognize some or all of the deferred tax assets. We have had a history of net losses since inception, and as a result, we have established a 100 percent valuation allowance for our net domestic and certain foreign deferred tax assets. If circumstances change and we determine that we will able to realize some or all of these net deferred tax assets in the future, we will record an adjustment to the valuation allowance.

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Consolidation of variable interest entities

We identify entities that (i) that do not have sufficient equity investment at risk to permit the entity to finance its activities without additional subordinated financial support, or (ii) in which the equity investors lack an essential characteristic of a controlling financial interest as variable interest entities ("VIE" or "VIEs"). We perform an initial and on-going evaluation of the entities with which we have variable interests to determine if any of these entities are VIEs. If an entity is identified as a VIE, we perform an assessment to determine whether we have both: (i) the power to direct activities that most significantly impact the VIE's economic performance, and (ii) have the obligation to absorb losses from or the right to receive benefits of the VIE that could potentially be significant to the VIE. If both of these criteria are satisfied, we are identified as the primary beneficiary of the VIE. As of December 31, 2015 and 2014, we determined that certain of our collaborators and joint ventures were VIEs. As of December 31, 2015, we also determined that Harvest was a VIE. We were not the primary beneficiary for these entities since we did not have the power to direct the activities that most significantly impact the economic performance of the VIEs. Our aggregate investment balance of these VIEs as of December 31, 2015 was $3.6 million, which represents our maximum risk of loss related to the identified VIEs. As of December 31, 2014, we did not hold any investment balances in the identified VIEs and therefore had no risk of loss at that date.

Valuation of goodwill and long-lived assets

We evaluate long-lived assets, which include property, plant and equipment and intangible assets, for impairment whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable. Conditions that would necessitate an impairment assessment include a significant decline in the observable market value of an asset, a significant change in the extent or manner an asset is used, or a significant adverse change that would indicate that the carrying amount of an asset or group of assets is not recoverable.

Goodwill and indefinite-lived intangible assets, which include in-process research and development, are tested for impairment annually, or more frequently if events or circumstances between annual tests indicate that the assets may be impaired. Impairment losses on goodwill and indefinite-lived intangible assets are recognized based solely on a comparison of their fair value to carrying value, without consideration of any recoverability test. We monitor the progression of our in-process research and development, as the likelihood of success is contingent upon regulatory approval.

Stock-based compensation

We record the fair value of stock options issued to employees and non-employees as of the grant date as stock-based compensation expense. Stock-based compensation expense for employees and non-employees is recognized over the requisite service period, which is typically the vesting period. We recorded stock-based compensation expense of $38.7 million, $21.8 million and $2.9 million for the years ended December 31, 2015, 2014 and 2013, respectively.

We utilize the Black-Scholes option-pricing model to estimate the grant-date fair value of all stock options. The Black-Scholes option-pricing model requires the use of weighted average assumptions for estimated expected volatility, estimated expected term of stock options, risk-free rate, estimated expected dividend yield, and the fair value of the underlying common stock at the date of grant. Because we do not have sufficient history to estimate the expected volatility of our common stock price, expected volatility is based on a blended approach which utilizes the volatility of our common stock and the average volatility of peer public entities that are similar in size and industry. We estimate the expected term of all stock options based on previous history of exercises. The risk-free rate is based on the U.S. Treasury yield curve in effect at the time of grant for the expected term of the stock option. The expected dividend yield is 0 percent as we do not expect to declare common stock dividends in the near future. Prior to our IPO, the fair value of the underlying common stock at the date of grant was determined based on a valuation of our common stock. Subsequent to our IPO, the fair value of the underlying common stock is determined based on the quoted market price of our common stock on the NYSE. We estimate forfeitures based on our historical analysis of actual stock option forfeitures. Actual forfeitures are recorded when incurred and estimated forfeitures are reviewed and adjusted at least annually. The assumptions used in the Black-Scholes option-pricing model for the years ended December 31, 2015, 2014 and 2013 are set forth below:

	Year Ended December 31,		
	2015	2014	2013

Valuation Assumptions			
Expected dividend yield	0%	0%	0%
Expected volatility	59%—62%	62%—64%	73%—75%
Expected term (years)	6.25	6.25	6.25
Risk-free interest rate	1.56%—1.95%	1.82%—2.14%	0.96%—1.86%

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We had 11,043,528 options outstanding as of December 31, 2015 of which 2,494,426 were exercisable. We had 8,323,544 options outstanding as of December 31, 2014 of which 1,448,434 were exercisable. Total unrecognized stock-based compensation expense related to non-vested awards at December 31, 2015 and December 31, 2014 was $113.7 million and $62.3 million, respectively, and is expected to be recognized over a weighted-average period of approximately three years. The weighted average grant date fair value for options granted in 2015 and 2014 was $25.96 and $16.40, respectively.

Inventory

The Company has livestock inventory which primarily includes adult female cows which are used in certain production processes and are recorded at acquisition cost using the first-in, first-out method or at market, whichever is lower. Work-in-process inventory includes allocations of production costs and facility costs on gestating livestock and are recorded at the lower of cost or market. Significant declines in the price of cows could result in unfavorable adjustments to inventory balances. As of December 31, 2015 and 2014, total inventory was $26.6 million and $25.8 million, respectively.

Recent accounting pronouncements

See Note 2 to our consolidated financial statements included in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K for a description of recent accounting pronouncements applicable to our business, which is incorporated herein by reference.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

The following sections provide quantitative information on our exposure to interest rate risk, stock price risk, and foreign currency exchange risk. We make use of sensitivity analyses which are inherently limited in estimating actual losses in fair value that can occur from changes in market conditions.

Interest rate risk

We had cash, cash equivalents and short-term and long-term investments of $343.8 million and $143.1 million at December 31, 2015 and 2014, respectively. Our cash and cash equivalents and short-term and long-term investments consist of cash, money market funds, U.S. government debt securities and certificates of deposit. The primary objective of our investment activities is to preserve principal, maintain liquidity and maximize income without significantly increasing risk. Our investments consist of U.S. government debt securities and certificates of deposit which may be subject to market risk due to changes in prevailing interest rates that may cause the fair values of our investments to fluctuate. We believe that a hypothetical 100 basis point increase in interest rates would not materially affect the fair value of our interest-sensitive financial instruments and any such losses would only be realized if we sold the investments prior to maturity.

Investments in publicly traded companies

We have common stock investments in several publicly traded companies that are subject to market price volatility. We have adopted the fair value method of accounting for these investments, except for our investment in AquaBounty as further described below, and therefore, have recorded them at fair value at the end of each reporting period with the unrealized gain or loss recorded as a separate component of other income (expense), net for the period. As of December 31, 2015 and December 31, 2014 the original aggregate cost basis of these investments was $107.2 million and $173.9 million, respectively, and the market value was $83.7 million and $164.9 million, respectively. The fair value of these investments is subject to fluctuation in the future due to the volatility of the stock market, changes in general economic conditions and changes in the financial conditions of these companies. The fair value of these investments as of December 31, 2015 would be approximately $92.1 million and $67.0 million, respectively, based on a hypothetical 10 percent increase or 20 percent decrease in the value of the investments. The fair value of these investments as of December 31, 2014 would be approximately $181.4 million and $131.9 million, respectively, based on a hypothetical 10 percent increase or 20 percent decrease in the value of the investments.

The common stock of AquaBounty is traded on the London Stock Exchange and at December 31, 2015, we owned 99,114,668 shares or approximately 63 percent. The fair value of our investment in AquaBounty at December 31, 2015 and December 31, 2014 was $36.7 million and $22.8 million, respectively. The fair value of our investment in AquaBounty as of December 31, 2015 would be approximately $40.4 million and $29.4 million, respectively, based on a hypothetical 10 percent increase or 20 percent decrease in the share price of AquaBounty. The fair value of our

investment in AquaBounty as of December 31, 2014 would be approximately $25.1 million and $18.2 million, respectively, based on a hypothetical 10 percent increase or 20 percent decrease in the share price of AquaBounty.

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Foreign currency exchange risk

We have international subsidiaries in Belgium, Brazil, Canada, England, and Hungary. These subsidiaries' assets, liabilities, and current revenues and expenses are denominated in their respective foreign currency. We do not hedge our foreign currency exchange rate risk. The effect of a hypothetical 10 percent change in foreign currency exchange rates applicable to our business would not have a material impact on our consolidated financial statements.

Item 8. Financial Statements and Supplementary Data

The information required by this Item 8 is contained on pages F-1 through F-49 of this annual report on Form 10-K and is incorporated herein by reference.

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

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Management, with the participation of our chief executive officer and our chief financial officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2015. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on their evaluation of our disclosure controls and procedures as of December 31, 2015, our chief executive officer and chief financial officer have concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

Management's Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as such term is defined in Rule 13a-15(f) and Rule 15d-15(f) of the Exchange Act. Our 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. Our internal control over financial reporting includes those policies and procedures that:

(i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets;

(ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of consolidated financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and

(iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the consolidated 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.

Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2015. In making this assessment, our management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control - Integrated Framework (2013). Based on this evaluation, management concluded that our internal control over financial reporting was effective as of December 31, 2015.

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Under guidelines established by the SEC, companies are permitted to exclude acquisitions from their assessment of internal control over financial reporting during the first year of an acquisition while integrating the acquired company. Management's assessment of our internal control over financial reporting as of December 31, 2015 excludes ActoGeniX NV, Okanagan Specialty Fruits, Inc., and Oxitec Limited, which were acquired by us in purchase business combinations in February 2015, April 2015, and September 2015, respectively. The 2015 acquisitions had total assets of $19.2 million and total revenues of $1.4 million which are included in our consolidated financial statements as of and for the year ended December 31, 2015.

PricewaterhouseCoopers LLP, an independent registered public accounting firm, has audited the effectiveness of our internal control over financial reporting as of December 31, 2015, as stated in their report, which is included in Part II Item 8 of this Form 10-K.

Changes in Internal Control Over Financial Reporting

There have been no changes in our internal control over financial reporting during the quarter ended December 31, 2015 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this item is hereby incorporated by reference to our Definitive Proxy Statement relating to our 2016 Annual Meeting of Shareholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2015.

Our board of directors has adopted a Code of Business Conduct and Ethics applicable to all officers, directors and employees, which is available on our website (investors.dna.com) under "Corporate Governance." We will provide a copy of this document, without charge, upon request, by writing to us at Intrexon Corporation, 20374 Seneca Meadows Parkway, Germantown, Maryland 20876, Attention: Investor Relations. We intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K regarding amendment to, or waiver from, a provision of our Code of Business Conduct and Ethics by posting such information on our website at the address and location specified above.

Item 11. Executive Compensation

The information required by this item is hereby incorporated by reference to our Definitive Proxy Statement relating to our 2016 Annual Meeting of Shareholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2015.

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

The information required by this item is hereby incorporated by reference to our Definitive Proxy Statement relating to our 2016 Annual Meeting of Shareholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2015.

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

The information required by this item is hereby incorporated by reference to our Definitive Proxy Statement relating to our 2016 Annual Meeting of Shareholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2015.

Item 14. Principal Accounting Fees and Services

The information required by this item is hereby incorporated by reference to our Definitive Proxy Statement relating to our 2016 Annual Meeting of Shareholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2015.

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PART IV

Item 15. Exhibits, Financial Statement Schedules

(a) The following consolidated financial statements of Intrexon Corporation and its subsidiaries, and the independent registered public accounting firm reports thereon, are included in Part II, Item 8 of this Annual Report on Form 10-K:

1. Financial Statements.

Consolidated Financial Statements of Intrexon Corporation and Subsidiaries

Report of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm

Consolidated Balance Sheets as of December 31, 2015 and 2014

Consolidated Statements of Operations for the Years Ended December 31, 2015, 2014, and 2013

Consolidated Statements of Comprehensive Loss for the Years Ended December 31, 2015, 2014, and 2013

Consolidated Statements of Shareholders' and Total Equity (Deficit) for the Years Ended December 31, 2015, 2014 and 2013

Consolidated Statements of Cash Flows for the Years Ended December 31, 2015, 2014, and 2013

Notes to Consolidated Financial Statements for the Years Ended December 31, 2015, 2014, and 2013

2. Financial Statement Schedules.

All financial statement schedules have been omitted because either the required information is not applicable or the information required is included in the consolidated financial statements and notes thereto included in this Form 10-K.

3. Exhibits.

The exhibits are listed in the Exhibit Index to this Annual Report.

(b) Exhibits

The response to this portion of Item 15 is submitted as a separate section to this Annual Report. See Exhibit Index.

(c) Financial Statement Schedules

The response to Item 15(a)2 is incorporated herein by reference.

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SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.
Dated: February 29, 2016

INTREXON CORPORATION

By: /S/ RANDAL J. KIRK
Randal J. Kirk
Chief Executive Officer and Chairman of the Board of Directors

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/S/ RANDAL J. KIRK Randal J. Kirk	Chief Executive Officer and Chairman of the Board of Directors (Principal Executive Officer)	2/29/2016
/S/ RICK L. STERLING Rick L. Sterling	Chief Financial Officer (Principal Accounting and Financial Officer)	2/29/2016
/S/ CESAR L. ALVAREZ Cesar L. Alvarez	Director	2/29/2016
/S/ STEVEN FRANK Steven Frank	Director	2/29/2016
/S/ JEFFREY B. KINDLER Jeffrey B. Kindler	Director	2/29/2016
/S/ DEAN J. MITCHELL Dean J. Mitchell	Director	2/29/2016
/S/ ROBERT B. SHAPIRO Robert B. Shapiro	Director	2/29/2016
/S/ JAMES S. TURLEY James S. Turley	Director	2/29/2016

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Index to the Financial Statements

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Intrexon Corporation and Subsidiaries
Consolidated Financial Statements
December 31, 2015, 2014 and 2013

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Intrexon Corporation

In our opinion, the consolidated financial statements of Intrexon Corporation listed in the accompanying index present fairly, in all material respects, the financial position of Intrexon Corporation and its subsidiaries at December 31, 2015 and 2014, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2015 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2015, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The Company's management is responsible for these financial statements, for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on these financial statements and on the Company's internal control over financial reporting based on our audits (which were integrated audits in 2015 and 2014). 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 audits to obtain reasonable assurance about whether the financial statements are free of material misstatement and whether effective internal control over financial reporting was maintained in all material respects. Our audits of the financial statements included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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 (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) 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 (iii) 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.

As described in Management's Annual Report on Internal Control Over Financial Reporting, management has excluded Oxitec Limited, ActoGeniX NV, and Okanagan Specialty Fruits, Inc. from its assessment of internal control over financial reporting as of December 31, 2015 because they were acquired by the Company in a purchase business combination during 2015. We have also excluded Oxitec Limited, ActoGeniX NV, and Okanagan Specialty Fruits, Inc. from our audit of internal control over financial reporting. Oxitec Limited, ActoGeniX NV, and Okanagan Specialty Fruits, Inc. wholly-owned subsidiaries whose total assets and total revenues represent $19.2 million and $1.4 million, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2015.

/s/ PricewaterhouseCoopers LLP

Charlotte, North Carolina

February 29, 2016

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Intrexon Corporation and Subsidiaries
Consolidated Balance Sheets
December 31, 2015 and 2014

(Amounts in thousands, except share and per share data)	2015	2014
Assets		
Current assets		
Cash and cash equivalents	$135,782	$27,466
Short-term investments	102,528	88,495
Receivables		
Trade, net	25,101	14,582
Related parties	23,597	12,622
Note	601	1,501
Other	2,995	559
Inventory	26,563	25,789
Prepaid expenses and other	6,634	3,759
Total current assets	323,801	174,773
Long-term investments	105,447	27,113
Equity securities	83,653	164,889
Property, plant and equipment, net	42,739	38,000
Intangible assets, net	247,535	65,947
Goodwill	165,169	101,059
Investments in affiliates	9,977	3,220
Other assets	3,725	1,271
Total assets	$982,046	$576,272
Liabilities and Total Equity		
Current liabilities		
Accounts payable	$4,967	$6,267
Accrued compensation and benefits	19,050	7,736
Other accrued liabilities	7,949	5,731
Deferred revenue	35,366	16,522
Lines of credit	561	2,273
Current portion of long term debt	930	1,675
Current portion of deferred consideration	6,931	7,064
Related party payables	150	214
Total current liabilities	75,904	47,482
Long term debt, net of current portion	7,598	8,694
Deferred consideration, net of current portion	8,698	13,421
Deferred revenue, net of current portion	162,363	96,687
Deferred tax liabilities	21,802	—
Other long term liabilities	795	699
Total liabilities	277,160	166,983
Commitments and contingencies (Note 16)		
Total equity		
Common stock, no par value, 200,000,000 shares authorized as of December 31, 2015 and 2014; and 116,658,886 shares and 100,557,932 shares issued and outstanding as of December 31, 2015 and 2014, respectively	—	—
Additional paid-in capital	1,249,559	843,001
Accumulated deficit	(542,729)	(458,236)
Accumulated other comprehensive loss	(12,752)	(4)

Total Intrexon shareholders' equity	694,078	384,761
Noncontrolling interests	10,808	24,528
Total equity	704,886	409,289
Total liabilities and total equity	$982,046	$576,272

The accompanying notes are an integral part of these consolidated financial statements.

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Operations
Years Ended December 31, 2015, 2014 and 2013

(Amounts in thousands, except share and per share data)	2015	2014	2013
Revenues			
Collaboration and licensing revenues	$87,821	$45,212	$23,525
Product revenues	41,879	11,481	164
Service revenues	42,923	14,761	—
Other revenues	982	476	71
Total revenues	173,605	71,930	23,760
Operating Expenses			
Cost of products	40,746	11,035	22
Cost of services	23,183	8,225	—
Research and development	147,483	58,983	48,143
Selling, general and administrative	109,057	63,649	33,618
Total operating expenses	320,469	141,892	81,783
Operating loss	(146,864)	(69,962)	(58,023)
Other Income (Expense), Net			
Unrealized and realized appreciation (depreciation) in fair value of equity securities	66,876	(10,469)	10,443
Gain on previously held equity investment	—	—	7,415
Interest expense	(1,244)	(666)	(141)
Interest income	1,884	806	166
Other income (expense), net	1,314	(168)	(162)
Total other income (expense), net	68,830	(10,497)	17,721
Equity in net loss of affiliates	(8,944)	(5,260)	(606)
Loss before income taxes	(86,978)	(85,719)	(40,908)
Income tax benefit (expense)	(1,016)	103	—
Net loss	$(87,994)	$(85,616)	$(40,908)
Net loss attributable to the noncontrolling interests	3,501	3,794	1,928
Net loss attributable to Intrexon	$(84,493)	$(81,822)	$(38,980)
Accretion of dividends on redeemable convertible preferred stock	—	—	(18,391)
Net loss attributable to common shareholders	$(84,493)	$(81,822)	$(57,371)
Net loss attributable to common shareholders per share, basic and diluted	$(0.76)	$(0.83)	$(1.40)
Weighted average shares outstanding, basic and diluted	111,066,352	99,170,653	40,951,952

The accompanying notes are an integral part of these consolidated financial statements.

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Comprehensive Loss
Years Ended December 31, 2015, 2014 and 2013

(Amounts in thousands)	2015	2014	2013
Net loss	$(87,994)	$(85,616)	$(40,908)
Other comprehensive income (loss):			
Unrealized gain (loss) on investments	(561)	21	21
Foreign currency translation adjustments	(12,108)	(33)	58
Comprehensive loss	(100,663)	(85,628)	(40,829)
Comprehensive loss attributable to the noncontrolling interests	3,422	3,750	1,901
Comprehensive loss attributable to Intrexon	$(97,241)	$(81,878)	$(38,928)

The accompanying notes are an integral part of these consolidated financial statements.

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Shareholders' and Total Equity (Deficit)
Years Ended December 31, 2015, 2014 and 2013

(Amounts in thousands, except share data)	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Intrexon Shareholders' Equity (Deficit)	Noncontrolling Interests	Total Equity (Deficit)
	Shares	Amount						
Balances at December 31, 2012	5,661,525	$ —	$ —	$ —	$ (321,553)	$ (321,553)	$ —	$ (321,553)
Shares issued in IPO	11,499,998	—	168,801	—	—	168,801	—	168,801
Stock-based compensation expense	—	—	2,812	—	—	2,812	109	2,921
Exercises of stock options and warrants	176,531	—	410	—	—	410	4	414
Contribution of services by shareholder	—	—	1,550	—	—	1,550	—	1,550
Shares issued as compensation for services	10,595	—	124	—	—	124	—	124
Accretion of dividends on redeemable convertible preferred stock	—	—	(2,510)	—	(15,881)	(18,391)	—	(18,391)
Conversion of redeemable convertible preferred stock, including accrued dividends, to common stock	79,705,130	—	571,898	—	—	571,898	—	571,898
Settlement of fractional shares from reverse stock split	(67)	—	(1)	—	—	(1)	—	(1)
Adjustments for noncontrolling interests	—	—	—	—	—	—	16,409	16,409
Net loss	—	—	—	—	(38,980)	(38,980)	(1,928)	(40,908)
Other comprehensive income	—	—	—	52	—	52	27	79
Balances at December 31, 2013	97,053,712	—	743,084	52	(376,414)	366,722	14,621	381,343
Stock-based compensation expense	—	—	21,692	—	—	21,692	157	21,849
Exercises of stock options and warrants	374,471	—	1,477	—	—	1,477	12	1,489
Contribution of services by shareholder	—	—	1,991	—	—	1,991	—	1,991
Shares issued as compensation for services	16,908	—	486	—	—	486	—	486
Shares issued in private placement	972,004	—	25,000	—	—	25,000	—	25,000
Shares issued in acquisitions	2,140,837	—	51,682	—	—	51,682	—	51,682

Adjustments for noncontrolling interests	—	—	(2,411)	—	—	(2,411)	13,488	11,077
Net loss	—	—	—	—	(81,822)	(81,822)	(3,794)	(85,616)
Other comprehensive income (loss)	—	—	—	(56)	—	(56)	44	(12)
Balances at December 31, 2014	100,557,932	—	843,001	(4)	(458,236)	384,761	24,528	409,289

The accompanying notes are an integral part of these consolidated financial statements.

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Shareholders' and Total Equity (Deficit)
Years Ended December 31, 2015, 2014 and 2013

(Amounts in thousands, except share data)	Common Stock Shares	Amount	Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Intrexon Shareholders' Equity (Deficit)	Noncontrolling Interests	Total Equity (Deficit)
Stock-based compensation expense	—	—	38,507	—	—	38,507	181	38,688
Exercises of stock options and warrants	1,148,463	—	14,462	—	—	14,462	—	14,462
Shares issued as compensation for services	70,925	—	2,169	—	—	2,169	—	2,169
Shares issued in public offerings, net of issuance costs	9,922,256	—	328,234	—	—	328,234	—	328,234
Shares issued as consideration for license agreement	2,100,085	—	59,579	—	—	59,579	—	59,579
Shares issued in acquisitions	2,552,151	—	126,863	—	—	126,863	—	126,863
Acquisition of noncontrolling interest	307,074	—	9,412	—	—	9,412	(10,978)	(1,566)
Adjustments for noncontrolling interests	—	—	(249)	—	—	(249)	499	250
Noncash dividend	—	—	(172,419)	—	—	(172,419)	—	(172,419)
Net loss	—	—	—	—	(84,493)	(84,493)	(3,501)	(87,994)
Other comprehensive income (loss)	—	—	—	(12,748)	—	(12,748)	79	(12,669)
Balances at December 31, 2015	116,658,886	$—	$1,249,559	$ (12,752)	$ (542,729)	$ 694,078	$ 10,808	$704,886

The accompanying notes are an integral part of these consolidated financial statements.

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Cash Flows
Years Ended December 31, 2015, 2014 and 2013

(Amounts in thousands)	2015	2014	2013
Cash flows from operating activities			
Net loss	$(87,994)	$(85,616)	$(40,908)
Adjustments to reconcile net loss to net cash provided by (used in) operating activities:			
Depreciation and amortization	17,743	10,415	7,205
Loss on disposal of property, plant and equipment	633	208	349
Unrealized and realized (appreciation) depreciation on equity securities	(66,876)	10,469	(10,443)
Amortization of discount/premium on investments	642	1,357	716
Equity in net loss of affiliates	8,944	5,260	606
Gain on previously held equity investment	—	—	(7,415)
Stock-based compensation expense	38,667	21,849	2,921
Contribution of services by shareholder	—	1,991	1,550
Shares issued as compensation for services	2,169	486	124
Shares issued as consideration for license agreement	59,579	—	—
Provision for bad debts	1,757	565	—
Deferred income taxes	1,117	—	—
Other noncash items	460	723	(75)
Changes in operating assets and liabilities:			
Receivables:			
Trade	(12,138)	4,332	(644)
Related parties	(11,042)	(6,117)	(4,967)
Note	—	(1)	—
Other	5,286	15	(542)
Inventory	(774)	(7,313)	—
Prepaid expenses and other	(2,729)	(465)	(347)
Other assets	(2,119)	80	(18)
Accounts payable	(3,263)	1,266	(43)
Accrued compensation and benefits	10,491	1,587	1,301
Other accrued liabilities	1,593	(586)	1,558
Deferred revenue	74,434	20,934	(4,368)
Deferred consideration	(943)	—	—
Related party payables	(64)	(1,137)	6
Other long term liabilities	96	(160)	(249)
Net cash provided by (used in) operating activities	35,669	(19,858)	(53,683)

The accompanying notes are an integral part of these consolidated financial statements.

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Cash Flows
Years Ended December 31, 2015, 2014 and 2013

(Amounts in thousands)	2015	2014	2013
Cash flows from investing activities			
Purchases of investments	(181,572)	(60,478)	(233,979)
Sales of investments	—	9,100	—
Maturities of investments	88,000	122,992	44,996
Purchases of equity securities and warrants	(17,080)	(19,496)	(28,650)
Acquisitions of businesses, net of cash received	(123,928)	(67,577)	517
Acquisition of noncontrolling interest	(1,566)	—	—
Investments in affiliates	(13,442)	(2,875)	(5,000)
Purchases of property, plant and equipment	(12,749)	(6,371)	(1,527)
Proceeds from sale of property, plant and equipment	626	176	480
Issuance of notes receivable	(600)	(1,500)	(1,000)
Proceeds from notes receivable	1,500	—	500
Net cash used in investing activities	(260,811)	(26,029)	(223,663)
Cash flows from financing activities			
Proceeds from issuance of Series F redeemable convertible preferred shares	—	—	150,000
Proceeds from IPO, net of issuance costs	—	—	168,801
Proceeds from issuance of shares in a private placement	—	25,000	—
Proceeds from issuance of shares in public offerings, net of issuance costs	328,234	—	—
Settlement of fractional shares	—	—	(5)
Advances from lines of credit	15,232	4,676	—
Repayments of advances from lines of credit	(16,944)	(6,494)	—
Proceeds from long term debt	81	268	493
Payments of long term debt	(1,564)	(679)	(104)
Payments of deferred consideration	(6,252)	—	—
Proceeds from stock option exercises	14,462	1,489	414
Payment of stock issuance costs	—	(256)	(3,148)
Net cash provided by financing activities	333,249	24,004	316,451
Effect of exchange rate changes on cash and cash equivalents	209	(160)	1
Net increase (decrease) in cash and cash equivalents	108,316	(22,043)	39,106
Cash and cash equivalents			
Beginning of period	27,466	49,509	10,403
End of period	$135,782	$27,466	$49,509
Supplemental disclosure of cash flow information			
Cash paid during the period for interest	$1,195	$158	$51
Cash paid during the period for income taxes	1,165	—	—
Significant noncash financing and investing activities			
Accretion of dividends on redeemable convertible preferred shares	$—	$—	$18,391
Conversion of redeemable convertible preferred shares, including accrued dividends, to common stock	—	—	571,898
Stock received as consideration for collaboration agreements	9,149	14,246	19,303
Stock issued in acquisitions, net	126,863	51,682	—
Stock issued to acquire noncontrolling interest	9,412	—	—

Noncash dividend to shareholders	172,419	—	—
Deferred consideration payable related to acquisition	1,992	20,115	—
Accrued investment in affiliate	—	—	1,500
Purchases of equipment included in accounts payable and other accrued liabilities	782	790	361

The accompanying notes are an integral part of these consolidated financial statements.

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Intrexon Corporation and Subsidiaries
Notes to Consolidated Financial Statements
(Amounts in thousands, except share and per share data)

1. Organization and Basis of Presentation

Intrexon Corporation ("Intrexon"), a Virginia corporation, forms collaborations to create biologically based products and processes using synthetic biology. Intrexon's primary domestic operations are in California, Florida, Maryland, and Virginia, and its primary international operations are in Belgium and Hungary. There have been no commercialized products derived from Intrexon's collaborations to date.

Trans Ova Genetics, L.C. and Subsidiaries ("Trans Ova"), a provider of bovine reproductive technologies and other genetic processes to cattle breeders and producers, is a wholly owned subsidiary of Intrexon with primary operations in Iowa, Maryland, Missouri, Oklahoma and Texas. ViaGen, L.C. ("ViaGen"), a provider of genetic preservation and cloning technologies, is a wholly owned subsidiary of Trans Ova. Exemplar Genetics, LLC ("Exemplar"), a provider of genetically engineered swine for medical and genetic research, is a wholly owned subsidiary through the combined investments of Intrexon, Trans Ova, and ViaGen.

Intrexon Produce Holdings, Inc. ("IPHI") is a wholly owned subsidiary of Intrexon. Okanagan Specialty Fruits, Inc. ("Okanagan"), a company which developed and received regulatory approval for the world's first non-browning apple without the use of any flavor-altering chemical or antioxidant additives, is a wholly owned subsidiary of IPHI with primary operations in Canada. Fruit Orchard Holdings, Inc. ("FOHI") is a wholly owned subsidiary of IPHI with primary operations in Washington.

Oxitec Limited ("Oxitec"), a pioneering company in biological insect control solutions, is a wholly owned subsidiary of Intrexon with primary operations in England and Brazil.

At December 31, 2015, Intrexon owned approximately 63% of AquaBounty Technologies, Inc. ("AquaBounty"), a company focused on improving productivity in commercial aquaculture, and 51% of Biological & Popular Culture, Inc. ("BioPop").

Intrexon Corporation and its consolidated subsidiaries are herein after referred to as the "Company."

On August 13, 2013, the Company completed its initial public offering ("IPO"), upon which all shares of the Company's redeemable convertible preferred stock, including accrued but unpaid dividends thereon, converted into 79,705,130 shares of common stock.

These consolidated financial statements are presented in United States dollars and are prepared under accounting principles generally accepted in the United States of America ("U.S. GAAP").

2. Summary of Significant Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements reflect the operations of the Company and its subsidiaries. All intercompany accounts and transactions have been eliminated.

Revenue Recognition

The Company generates revenue through contractual agreements with collaborators (known as exclusive channel collaborations, "ECC" or "ECCs") and licensing agreements whereby the collaborators or the licensee obtain exclusive access to the Company's proprietary technologies for use in the research, development and commercialization of products and/or treatments in a contractually specified field of use. Generally, the terms of these agreements provide that the Company receives some or all of the following: (i) upfront payments upon consummation of the agreement, (ii) reimbursements for costs incurred by the Company for research and development and/or manufacturing efforts related to specific applications provided for in the agreement, (iii) milestone payments upon the achievement of specified development, regulatory and commercial activities, and (iv) royalties on sales of products arising from the collaboration or licensing agreement.

The Company's collaboration and licensing agreements typically contain multiple elements, or deliverables, including technology licenses, research and development services, and in certain cases manufacturing services. The Company identifies

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the deliverables within the agreements and evaluates which deliverables represent separate units of accounting. Analyzing the agreements to identify deliverables requires the use of judgment. A deliverable is considered a separate unit of accounting when the deliverable has value to the collaborator or licensee on a standalone basis based on the consideration of the relevant facts and circumstances for each agreement.

Consideration received is allocated at the inception of the agreement to all identified units of accounting based on their relative selling price. When available, the relative selling price for each deliverable is determined using vendor specific objective evidence ("VSOE") of the selling price or third-party evidence of the selling price, if VSOE does not exist. If neither VSOE nor third-party evidence of the selling price exists, the Company uses its best estimate of the selling price ("BESP") for the deliverable. The amount of allocable consideration is limited to amounts that are fixed or determinable. The consideration received is allocated among the separate units of accounting, and the applicable revenue recognition criteria are applied to each of the separate units. The Company recognizes the revenue allocated to each unit of accounting as the Company delivers the related goods or services. If the Company determines that certain deliverables should be treated as a single unit of accounting, then the revenue is recognized using either a proportional performance or straight-line method, depending on whether the Company can reasonably estimate the level of effort required to complete its performance obligations under an arrangement and whether such performance obligations are provided on a best-efforts basis. As the Company cannot reasonably estimate its performance obligations related to its collaborators or licensees, the Company recognizes revenue on a straight-line basis over the period it expects to complete its performance obligations.

The terms of the Company's agreements may provide for milestone payments upon achievement of certain defined events. The Company applies the Milestone Method for recognizing milestone payments. Under the Milestone Method, the Company recognizes consideration that is contingent upon the achievement of a milestone in its entirety as revenue in the period in which the milestone is achieved only if the milestone is substantive in its entirety. A milestone is considered substantive when it meets all of the following criteria:

(1) The consideration is commensurate with either the entity's performance to achieve the milestone or the enhancement of the value of the delivered item or items as a result of a specific outcome resulting from the entity's performance to achieve the milestone;

(2) The consideration relates solely to past performance; and

(3) The consideration is reasonable relative to all of the deliverables and payment terms within the arrangement.

In the event that a milestone is not considered substantive, the Company recognizes the milestone consideration as revenue using the same method applied to upfront payments.

Research and development services are a deliverable satisfied by the Company in accordance with the terms of the collaboration and licensing agreements and the Company considers these services to be inseparable from the license to the core technology; therefore, reimbursements of services performed are recognized as revenue. Because reimbursement (i) is contingent upon performance of the services by the Company, (ii) does not include a profit component, and (iii) does not relate to any future deliverable, the revenue is recognized during the period in which the related services are performed and collection of such amounts is reasonably assured. Payments received for manufacturing services will be recognized when the earnings process related to the manufactured materials has been completed. Royalties to be received under the agreements will be recognized as earned.

From time to time, the Company and certain collaborators may cancel their agreements, relieving the Company of any further performance obligations under the agreement. When no further performance obligations are required of the Company under an agreement, the Company recognizes any remaining deferred revenue.

The Company also generates product and service revenues primarily through sales of advanced reproductive technologies, including bovine embryos derived from the Company's embryo transfer and in vitro fertilization processes and from genetic preservation and sexed semen processes and applications of such processes to other livestock, as well as sales of livestock used in production. Revenue is recognized when (i) persuasive evidence of an arrangement exists, (ii) services have been rendered or delivery has occurred such that risk of loss has passed to the customer, (iii) the price is fixed or determinable, and (iv) collection from the customer is reasonably assured.

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Research and Development

The Company considers that regulatory and other uncertainties inherent in the research and development of new products preclude it from capitalizing such costs. Research and development expenses include salaries and related costs of research and development personnel, including stock-based compensation expense, and the costs of consultants, certain in-license technology rights, facilities, materials and supplies associated with research and development projects as well as various laboratory studies. Indirect research and development costs include depreciation, amortization and other indirect overhead expenses.

The Company has research and development arrangements with third parties that include upfront and milestone payments and primarily relate to collaborations. At December 31, 2015 and 2014, the Company had research and development commitments with third parties that had not yet been incurred totaling $4,138 and $2,183, respectively. The commitments are generally cancellable by the Company at any time upon written notice.

Cash and Cash Equivalents

All highly liquid investments with an original maturity of three months or less at the date of purchase are considered to be cash equivalents. Cash balances at a limited number of banks may periodically exceed insurable amounts. The Company believes that it mitigates its risk by investing in or through major financial institutions with high quality credit ratings. Recoverability of investments is dependent upon the performance of the issuer. At December 31, 2015 and 2014, the Company had cash equivalent investments in highly liquid money market accounts at major financial institutions of $112,776 and $16,598, respectively.

Short-term and Long-term Investments

At December 31, 2015, short-term and long-term investments include U.S. government debt securities and certificates of deposit. The Company determines the appropriate classification as short-term or long-term at the time of purchase based on original maturities and management's reasonable expectation of sales and redemption. The Company reevaluates such classification at each balance sheet date. The Company's written investment policy requires investments to be explicitly rated by two of the three following rating services: Standard & Poor's, Moody's and/or Fitch and to have a minimum rating of A1, P1 and/or F-1, respectively, from those agencies. In addition, the investment policy limits the amount of credit exposure to any one issuer.

Equity Securities

The Company holds equity securities received and/or purchased from certain collaborators. Other than investments accounted for using the equity method, the Company elected the fair value option to account for its equity securities held in these collaborators. These equity securities are recorded at fair value at each reporting date and are subject to market price volatility. Unrealized gains and losses resulting from fair value adjustments are reported in the consolidated statement of operations. The fair value of these equity securities is subject to fluctuation in the future due to the volatility of the stock market, changes in general economic conditions and changes in the financial conditions of these collaborators. These equity securities are classified as noncurrent in the consolidated balance sheet since the Company does not intend to sell these equity securities within one year.

The Company records the fair value of securities received on the date the collaboration is consummated or the milestone is achieved using the closing, quoted price of the collaborator's security on that date, assuming the transfer of consideration is considered perfunctory. If the transfer of the consideration is not considered perfunctory, the Company considers the specific facts and circumstances to determine the appropriate date on which to evaluate fair value. The Company also evaluates whether any discounts for trading restrictions or other basis for lack of marketability should be applied to the fair value of the securities at inception of the collaboration. In the event the Company concludes that a discount should be applied, the fair value of the securities is adjusted at inception of the collaboration and re-evaluated at each reporting period thereafter.

Fair Value of Financial Instruments

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset and liability. As a basis for considering such assumptions, the Company uses a three-tier fair value hierarchy that prioritizes the inputs used in its fair value measurements. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for

identical assets or liabilities (Level 1

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measurements) and the lowest priority to unobservable inputs (Level 3 measurements). The three levels of the fair value hierarchy are as follows:

Level 1: Quoted prices in active markets for identical assets and liabilities;

Level 2: Other than quoted prices included in Level 1 inputs that are observable for the asset or liability, either directly or indirectly; and

Level 3: Unobservable inputs for the asset or liability used to measure fair value to the extent that observable inputs are not available.

Concentrations of Risk

Due to the Company's mix of fixed and variable rate securities holdings, the Company's investment portfolio is susceptible to changes in interest rates. As of December 31, 2015, gross unrealized losses on the Company's short-term and long-term investments were not material. From time to time, the Company may liquidate some or all of its investments to fund operational needs or other activities, such as capital expenditures or business acquisitions, or distribute its equity securities to shareholders as a stock dividend. Depending on which investments the Company liquidates to fund these activities, the Company could recognize a portion, or all, of the gross unrealized losses.

Financial instruments which potentially subject the Company to concentrations of credit risk consist primarily of trade receivables. The Company controls credit risk through credit approvals, credit limits and monitoring procedures. The Company performs ongoing credit evaluations of its customers but generally does not require collateral to support accounts receivable.

Equity Method Investments

Through March 2013, the Company accounted for its investment in AquaBounty using the equity method of accounting since the Company had the ability to exercise significant influence, but not control, over the operating activities of AquaBounty. The excess of the investment over the Company's pro-rata share of AquaBounty's net assets represented identifiable intangible assets and equity-method goodwill. In March 2013, the Company acquired additional ownership interests in AquaBounty which resulted in the Company gaining control over AquaBounty, thereby requiring consolidation effective on that date. The Company recognized a gain of $7,415 to account for the difference between the carrying value and the fair value of the previously held equity interest.

The Company is party to four strategic joint ventures. The Company accounts for its investments in these joint ventures and for its investment in Thrive Agrobiotics, Inc. ("Thrive Agrobiotics") using the equity method of accounting since the Company has the ability to exercise significant influence, but not control, over the operating activities of these entities.

The Company determined that it has significant influence over one of its collaborators, Oragenics, Inc. ("Oragenics"), as of December 31, 2015, and over two if its collaborators, Oragenics and ZIOPHARM Oncology, Inc. ("ZIOPHARM"), as of December 31, 2014, based on its ownership interests, representation on the board of directors of the collaborators and other qualitative factors. The Company accounts for these investments using the fair value option. In 2014 and 2013, the Company determined that ZIOPHARM met the criteria of SEC Regulation S-X Article 3-09 for inclusion of separate financial statements of an equity method investment.

The fair value of the Company's equity securities of Oragenics was $16,601 and $7,192 as of December 31, 2015 and 2014, respectively, and is included as equity securities in the respective consolidated balance sheets. The Company's ownership percentage of Oragenics was 30.7% and 24.4% at December 31, 2015 and 2014, respectively. Unrealized appreciation (depreciation) in the fair value of the Company's equity securities held in Oragenics was $4,863, $(14,969), and $(90) for the years ended December 31, 2015, 2014, and 2013, respectively.

In June 2015, the Company distributed all of its holdings in ZIOPHARM to the Company's shareholders in the form of a special stock dividend (Note 13). Upon disposition, the Company realized a gain of $81,401 during the year ended December 31, 2015. As of December 31, 2014, the Company's ownership percentage in ZIOPHARM was 15.7% and the fair value of the Company's equity securities of ZIOPHARM was $83,099 and is included as equity securities in the December 31, 2014 consolidated balance sheet. Unrealized appreciation in the fair value of the Company's equity securities held in ZIOPHARM was $11,965 and $4,836 for the years ended December 31, 2014 and

2013, respectively.

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Summarized financial data as of December 31, 2015 and 2014, and for the years ended December 31, 2015, 2014, and 2013, for the Company's equity method investments are as follows:

	December 31,	
	2015	2014
Current assets	$28,123	$63,627
Non-current assets	1,539	1,259
Total assets	29,662	64,886
Current liabilities	6,274	15,346
Non-current liabilities	—	570
Total liabilities	6,274	15,916
Net assets	$23,388	$48,970

	Year Ended December 31,		
	2015	2014	2013
Revenues, net	$1,720	$2,313	$1,832
Operating expenses	123,842	62,161	77,011
Operating loss	(122,122)	(59,848)	(75,179)
Other	(54)	11,753	743
Net loss	$(122,176)	$(48,095)	$(74,436)

Variable Interest Entities

The Company identifies entities that (i) do not have sufficient equity investment at risk to permit the entity to finance its activities without additional subordinated financial support or (ii) in which the equity investors lack an essential characteristic of a controlling financial interest as variable interest entities ("VIE" or "VIEs"). The Company performs an initial and on-going evaluation of the entities with which the Company has variable interests to determine if any of these entities are VIEs. If an entity is identified as a VIE, the Company performs an assessment to determine whether the Company has both (i) the power to direct activities that most significantly impact the VIE's economic performance and (ii) have the obligation to absorb losses from or the right to receive benefits of the VIE that could potentially be significant to the VIE. If both of these criteria are satisfied, the Company is identified as the primary beneficiary of the VIE.

As of December 31, 2015 and 2014, the Company determined that certain of its collaborators and joint ventures were VIEs. As of December 31, 2015, the Company also determined that Harvest Enterprise Fund I, LP ("Harvest") was a VIE. The Company was not the primary beneficiary for these entities since it did not have the power to direct the activities that most significantly impact the economic performance of the VIEs. The Company's aggregate investment balances of these VIEs as of December 31, 2015 was $3,598, which represents the Company's maximum risk of loss related to the identified VIEs. As of December 31, 2014, the Company did not hold any investment balances in the identified VIEs and therefore had no risk of loss as of that date.

Trade Receivables

Trade receivables consist of credit extended to the Company's customers and collaborators in the normal course of business and are reported net of an allowance for doubtful accounts. The Company reviews its customer accounts on a periodic basis and records bad debt expense for specific amounts the Company evaluates as uncollectible. Past due status is determined based upon contractual terms. Amounts are written off at the point when collection attempts have been exhausted. Management estimates uncollectible amounts considering such factors as current economic conditions and historic and anticipated customer performance. This estimate can fluctuate due to changes in economic, industry or specific customer conditions which may require adjustment to the allowance recorded by the Company. Management has included amounts believed to be uncollectible in the allowance for doubtful accounts.

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The following table shows the activity in the allowance for doubtful accounts for the years ended December 31, 2015 and 2014:

	2015	2014
Beginning balance	$565	$—
Charged to operating expenses	1,757	565
Write offs of accounts receivable	(241)	—
Ending balance	$2,081	$565

Inventory

The Company's inventory primarily includes adult female cows which are used in certain production processes and are recorded at acquisition cost using the first-in, first-out method or at market, whichever is lower. Work-in-process inventory includes allocations of production costs and facility costs for products currently in production and is recorded at the lower of cost or market. Significant declines in the price of cows could result in unfavorable adjustments to inventory balances.

Property, Plant and Equipment

Property, plant and equipment are stated at cost, less accumulated depreciation and amortization. Major additions or betterments are capitalized and repairs and maintenance are generally expensed as incurred. Depreciation and amortization is calculated using the straight-line method over the estimated useful lives of the assets. The estimated useful lives of these assets are as follows:

	Years
Land improvements	4–20
Buildings and building improvements	3–23
Furniture and fixtures	1–10
Equipment	1–10
Computer hardware and software	1–7

Leasehold improvements are amortized over the shorter of the useful life of the asset or the applicable lease term, generally one to fourteen years.

Goodwill

Goodwill represents the future economic benefits arising from other assets acquired in a business combination that are not individually identified and separately recognized. Goodwill is reviewed for impairment at least annually. The Company performs a qualitative assessment to determine whether it is more-likely-than-not that the fair value of a reporting unit is less than its carrying amount prior to performing the two-step goodwill impairment test. If this is the case, the two-step goodwill impairment test is required. If it is more-likely-than-not that the fair value of a reporting unit is greater than the carrying amount, the two-step goodwill impairment test is not required.

If the two-step goodwill impairment test is required, first, the fair value of the reporting unit is compared with its carrying amount (including goodwill). If the fair value of the reporting unit is less than its carrying amount, an indication of goodwill impairment exists for the reporting unit and the entity must perform step two of the impairment test. Under step two, an impairment loss is recognized for any excess of the carrying amount of the reporting unit's goodwill over the implied fair value of that goodwill. The implied fair value of goodwill is determined by allocating the fair value of the reporting unit in a manner similar to a purchase price allocation and the residual fair value after this allocation is the implied fair value of the reporting unit goodwill. Fair value of the reporting unit is determined using a discounted cash flow analysis. If the fair value of the reporting unit exceeds its carrying amount, step two does not need to be performed.

The Company performs its annual impairment review of goodwill in the fourth quarter, or sooner if a triggering event occurs prior to the annual impairment review.

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Intangible Assets

Intangible assets subject to amortization consist of patents, related technologies and know-how; customer relationships; trademarks; and a covenant not to compete acquired as a result of mergers and acquisitions. These intangible assets are subject to amortization, were recorded at fair value at the date of acquisition and are stated net of accumulated amortization. Indefinite-lived intangible assets consist of in-process research and development acquired in mergers and acquisitions and were recorded at fair value at the dates of the respective acquisitions.

The Company amortizes long-lived intangible assets to reflect the pattern in which the economic benefits of the intangible asset are expected to be realized. The intangible assets are amortized over their remaining estimated useful lives, ranging from two to eighteen years for the patents, related technologies and know-how; customer relationships; trademarks; and the covenant not to compete.

Impairment of Long-Lived Assets

Long-lived assets to be held and used, including property, plant and equipment and intangible assets subject to amortization, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable. Conditions that would necessitate an impairment assessment include a significant decline in the observable market value of an asset, a significant change in the extent or manner in which an asset is used, or a significant adverse change that would indicate that the carrying amount of an asset or group of assets is not recoverable.

Indefinite-lived intangible assets, including in-process research and development, are tested for impairment annually, or more frequently if events or circumstances between annual tests indicate that the asset may be impaired. Impairment losses on indefinite-lived intangible assets are recognized based solely on a comparison of their fair value to carrying value, without consideration of any recoverability test. The Company monitors the progression of its in-process research and development, as the likelihood of success is contingent upon commercial development or regulatory approval.

Foreign Currency Translation

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 the consolidated statement of comprehensive loss. Revenue and expense amounts are translated at average rates during the period.

Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to both differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases as well as operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date of the change. Valuation allowances are established when necessary to reduce deferred tax assets to the amount expected to be realized.

The Company identifies any uncertain income tax positions and recognizes the effect of income tax positions only if those positions are more likely than not of being sustained. Recognized income tax positions are measured at the largest amount that is greater than 50% likely of being realized. Changes in recognition or measurement are reflected in the period in which the change in judgment occurs. The Company records interest, if any, related to unrecognized tax benefits as a component of interest expense. Penalties, if any, are recorded in selling, general and administrative expenses.

Share-Based Payments

Intrexon uses the Black-Scholes option pricing model to estimate the grant-date fair value of all stock options. The Black-Scholes option pricing model requires the use of assumptions for estimated expected volatility, estimated expected term of stock options, risk-free rate, estimated expected dividend yield, and the fair value of the underlying common stock at the date of grant. Since Intrexon does not have sufficient history to estimate the expected volatility of its common stock price, expected volatility is based on a blended approach which utilizes the volatility of Intrexon's

common stock and the volatility of peer public entities that are similar in size and industry. Intrexon estimates the expected term of all options based on previous history of exercises. The risk-free rate is based on the U.S. Treasury yield curve in effect at the time of grant for the expected term of

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the option. The expected dividend yield is 0% as Intrexon does not expect to declare common stock dividends in the near future. Prior to Intrexon's IPO, the fair value of the underlying common stock is determined based on a valuation of Intrexon's common stock. Subsequent to Intrexon's IPO, the fair value of the underlying common stock is determined based on the quoted market price on the New York Stock Exchange. Intrexon estimates forfeitures based on its historical analysis of actual stock option forfeitures. Actual forfeitures are recorded when incurred and estimated forfeitures are reviewed and adjusted at least annually. The assumptions used in the Black-Scholes option pricing model for the years ended December 31, 2015, 2014 and 2013 are set forth in the table below:

	2015	2014	2013
Valuation assumptions			
Expected dividend yield	0%	0%	0%
Expected volatility	59%—62%	62%—64%	73%—75%
Expected term (years)	6.25	6.25	6.25
Risk-free interest rate	1.56%—1.95%	1.82%—2.14%	0.96%—1.86%

Net Loss per Share

Basic net loss per share is calculated by dividing net loss attributable to common shareholders by the weighted average shares outstanding during the period, without consideration of common stock equivalents. Diluted net loss per share is calculated by adjusting weighted average shares outstanding for the dilutive effect of common stock equivalents outstanding for the period, using the treasury-stock method. For purposes of the diluted net loss per share calculation, preferred stock, stock options and warrants are considered to be common stock equivalents but are excluded from the calculation of diluted net loss per share because their effect would be anti-dilutive and, therefore, basic and diluted net loss per share were the same for all periods presented.

Segment Information

The Company has determined that it operates in one segment. The Company applies its technologies to create products and services which may be either sold directly to customers or developed through collaboration with third parties. As of December 31, 2015 and 2014, the Company had $3,877 and $2,200, respectively, of long-lived assets in foreign countries. The Company recognized revenues derived in foreign countries totaling $5,918 and $2,166 for the years ended December 31, 2015 and 2014, respectively.

Recently Issued Accounting Pronouncements

In February 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2016-02, Leases (Topic 842) ("ASU 2016-02"). The provisions of ASU 2016-02 set out the principles for the recognition, measurement, presentation and disclosure of leases for both parties to a contract (i.e. lessees and lessors). The new standard requires lessees to apply a dual approach, classifying leases as either finance or operating leases based on the principle of whether or not the lease is effectively a financed purchase by the lessee. This classification will determine whether lease expense is recognized based on an effective interest method or on a straight line basis over the term of the lease, respectively. A lessee is also required to record a right-of-use asset and a lease liability for all leases with a term of greater than 12 months regardless of their classification. Leases with a term of 12 month or less will be accounted for similar to existing guidance for operating leases today. Topic 842 supersedes the previous leave standard, Topic 840 Leases. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2018, and is effective for the Company for the year ending December 31, 2019. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In January 2016, the FASB issued ASU 2016-01, Financial Instruments - Overall (Subtopic 825-10) - Recognition and Measurement of Financial Assets and Financial Liabilities ("ASU 2016-01"). The provisions of ASU 2016-01 make targeted improvements to enhance the reporting model for financial instruments to provide users of financial statements with more decision-useful information, including certain aspects of recognition, measurement, presentation, and disclosure of financial instruments. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2017, and is effective for the Company for the year ending December 31, 2018. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In November 2015, the FASB issued ASU 2015-17, Income Taxes (Topic 740) - Balance Sheet Classification of Deferred Taxes ("ASU 2015-17"). The provisions of ASU 2015-17 simplify the presentation of deferred income taxes by requiring an entity to

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classify deferred tax liabilities and assets as noncurrent on a classified balance sheet. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2016, with early adoption permitted, and is effective for the Company for the year ending December 31, 2017. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In September 2015, the FASB issued ASU 2015-16, Business Combinations: Simplifying the Accounting for Measurement-Period Adjustments ("ASU 2015-16"). The provisions of ASU 2015-16 eliminate the requirement for an acquirer in a business combination to account for measurement-period adjustments retrospectively. Rather, the acquirer must recognize adjustments during the period in which the amounts are determined, including the effect on earnings of any amounts that would have been recorded in previous periods. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2015, with early adoption permitted. The Company elected to early adopt this guidance and there was no significant impact on the Company's consolidated financial statements.

In July 2015, the FASB issued ASU 2015-11, Inventory (Topic 330) - Simplifying the Measurement of Inventory ("ASU 2015-11"). The provisions of ASU 2015-11 provide guidance for simplifying the calculation for subsequent measurement of inventory measured using the first-in-first-out or average cost methods. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2016, and is effective for the Company for the year ending December 31, 2017. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In February 2015, the FASB issued ASU 2015-02, Consolidation (Topic 810) - Amendments to the Consolidation Analysis ("ASU 2015-02"). The provisions of ASU 2015-02 provide guidance which changes the analysis that a reporting entity must perform to determine whether it should consolidate certain types of legal entities. This guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2015, with early adoption permitted. The Company elected to early adopt this guidance and there was no significant impact on the Company's consolidated financial statements.

In May 2014, the FASB issued ASU 2014-9, Revenue from Contracts with Customers ("ASU 2014-9"). The FASB issued ASU 2014-9 to clarify the principles for recognizing revenue and to develop a common revenue standard for U.S. GAAP. The standard outlines a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and supersedes the most current revenue recognition guidance. This guidance was originally effective for annual periods and interim periods within those annual periods beginning after December 15, 2016 and early adoption was not permitted. In August 2015, the FASB issued ASU 2015-14, Revenue from Contracts with Customers (Topic 606) - Deferral of the Effective Date ("ASU 2015-14"), which deferred the effective date of the guidance in ASU 2014-9 by one year to December 15, 2017 for interim and annual reporting periods beginning after that date and permitted early adoption of the standard, but not before the original effective date of December 15, 2016, and is effective for the Company for the year ending December 31, 2018. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

Reclassifications

Certain insignificant reclassifications have been made to the prior year consolidated financial statements to conform to the current year presentation.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting periods. Actual results could differ from those estimates.

3. Mergers and Acquisitions

Oxitec Acquisition

In September 2015, pursuant to a Stock Purchase Agreement (the "Oxitec Purchase Agreement"), the Company acquired 100% of the issued outstanding share capital of Oxitec, a pioneering company in biological insect control solutions, thereby expanding the Company's capabilities to address a broad range of global environment, health and

agricultural challenges. The aggregated consideration paid consisted of (i) 1,359,343 shares of the Company's common stock (the "Stock Consideration")

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and (ii) $90,199 in cash (the "Cash Consideration"), inclusive of net cash and working capital adjustments as defined in the Oxitec Purchase Agreement totaling $9,449. Stock Consideration totaling 480,422 shares and Cash Consideration totaling $1,991 were withheld as escrow at closing and are issuable and payable eighteen months after closing subject to reduction for satisfaction of any claims for indemnification made by the Company under the Oxitec Purchase Agreement. Cash Consideration withheld is included in deferred consideration as of December 31, 2015. The results of Oxitec's operations subsequent to the acquisition date have been included in the consolidated financial statements.

The fair value of the total consideration transferred was $146,394. The acquisition date fair value of the Stock Consideration and Cash Consideration is presented below:

Cash	$90,199
Common shares	56,195
	$146,394

The fair value of the shares of the Company common stock issued was based on the quoted closing price of the Company's common stock as of the closing date of the acquisition. The estimated fair value of assets acquired and liabilities assumed at the acquisition date is shown below:

Cash	$3,780
Trade receivables	125
Other receivables	7,395
Prepaid expenses and other	121
Property, plant, and equipment	1,198
Intangible assets	96,854
Total assets acquired	109,473
Accounts payable	1,187
Accrued compensation and benefits	246
Other accrued liabilities	210
Deferred revenue	120
Deferred tax liabilities	12,584
Total liabilities assumed	14,347
Net assets acquired	95,126
Goodwill	51,268
Total consideration	$146,394

The acquired intangible assets primarily include in-process research and development, the fair value of which was determined using the multi-period excess earning method, which is a variation of the income approach that converts future cash flows to single discounted present value amounts. The in-process research and development are currently indefinite-lived intangible assets and, accordingly, are not being amortized. Goodwill, which is not expected to be deductible for tax purposes, represents the assembled workforce and the potential for future Oxitec products and technologies.

The Company incurred $1,675 of acquisition related costs, all of which is included in selling, general and administrative expenses in the accompanying consolidated statement of operations for the year ended December 31, 2015.

Okanagan Acquisition

In April 2015, pursuant to a Stock Purchase Agreement (the "Okanagan Purchase Agreement"), the Company acquired 100% of the outstanding shares of Okanagan, the pioneering agricultural company behind the world's first non-browning apple. In addition to supporting Okanagan's further development and commercialization of its apple products, the Company expects to utilize its proprietary technologies to assist Okanagan in the development of further novel beneficial plant traits. Pursuant to the Okanagan Purchase Agreement, the former shareholders of Okanagan received an aggregate of 707,853 shares of the

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Company's common stock, and $10,000 cash in exchange for all of the shares in Okanagan. The results of Okanagan's operations subsequent to the acquisition date have been included in the consolidated financial statements.

The fair value of the total consideration transferred was $40,933. The acquisition date fair value of each class of consideration transferred is presented below:

Cash	$10,000
Common shares	30,933
	$40,933

The fair value of the shares of the Company's common stock issued was based on the quoted closing price of the Company's common stock as of the closing date of the acquisition. The estimated fair value of assets acquired and liabilities assumed at the acquisition date is shown below along with subsequent adjustments during the measurement period to the fair value of assets acquired and liabilities assumed. The adjustments resulted from revisions to the valuation of intangible assets.

	Initial Estimated Fair Value	Adjustments	Adjusted Fair Value
Cash	$58	$—	$58
Trade receivables	16	—	16
Other receivables	49	—	49
Property, plant, and equipment	32	—	32
Intangible assets	33,800	2,700	36,500
Total assets acquired	33,955	2,700	36,655
Accounts payable	181	—	181
Deferred revenue	181	—	181
Deferred tax liabilities	8,145	702	8,847
Total liabilities assumed	8,507	702	9,209
Net assets acquired	25,448	1,998	27,446
Goodwill	15,485	(1,998)	13,487
Total consideration	$40,933	$—	$40,933

The acquired intangible assets primarily include developed technology, patents and know-how and the fair values of the acquired assets were determined using the with and without method, which is a variation of the income approach that utilizes estimated cash flows with all assets in place at the valuation date and estimated cash flows with all assets in place except the intangible assets at the valuation date. The intangible assets are being amortized over a useful life of fourteen years. Goodwill, which is not expected to be deductible for tax purposes, represents potential future applications of Okanagan's technology to other fruits, including additional apple varietals, and anticipated buyer-specific synergies arising from the combination of the Company's and Okanagan's technologies.

The Company incurred $341 of acquisition-related costs, of which $267 and $74 is included in selling, general and administrative expenses in the accompanying consolidated statements of operations for the years ended December 31, 2015 and 2014, respectively.

ActoGeniX Acquisition

In February 2015, the Company acquired 100% of the membership interests of ActoGeniX NV ("ActoGeniX"), a European biopharmaceutical company, pursuant to a Stock Purchase Agreement (the "ActoGeniX Purchase Agreement"). ActoGeniX's platform technology complements our suite of proprietary technologies available for current and future collaborators. Pursuant to the ActoGeniX Purchase Agreement, the former members of ActoGeniX received an aggregate of 965,377 shares of the Company's common stock and $32,739 in cash in exchange for all membership interests of ActoGeniX. The results of ActoGeniX's operations subsequent to the acquisition date have been included in the consolidated financial statements.

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The fair value of the total consideration transferred was $72,474. The acquisition date fair value of each class of consideration transferred is presented below:

Cash	$32,739
Common shares	39,735
	$72,474

The fair value of the shares of the Company's common stock issued was based on the quoted closing price of the Company's common stock as of the closing date of the acquisition. The estimated fair value of assets acquired and liabilities assumed at the acquisition date is shown below along with subsequent adjustments during the measurement period to the fair value of assets acquired and liabilities assumed. The adjustments resulted from the difference between estimated and actual accrued expenses.

	Initial Estimated Fair Value	Adjustments	Adjusted Fair Value
Cash	$3,180	$—	$3,180
Other receivables	305	—	305
Prepaid expenses and other	31	—	31
Property, plant and equipment	209	—	209
Intangible assets	68,100	—	68,100
Other non-current assets	23	—	23
Total assets acquired	71,848	—	71,848
Accounts payable	230	—	230
Accrued compensation and benefits	624	(428)	196
Other accrued liabilities	307	(54)	253
Deferred revenue	732	—	732
Deferred tax liabilities	612	—	612
Total liabilities assumed	2,505	(482)	2,023
Net assets acquired	69,343	482	69,825
Goodwill	3,131	(482)	2,649
Total consideration	$72,474	$—	$72,474

The acquired intangible assets primarily include in-process research and development, the fair value of which was determined using the multi-period excess earnings and with-and-without methods, which are both variations of the income approach that convert future cash flows to single discounted present value amounts. In August 2015, the Company re-evaluated the acquired in-process research and development and determined that it was placed in service as developed technology and began amortizing the original amount capitalized using a useful life of eighteen years. Goodwill, which is not expected to be deductible for tax purposes, represents the assembled workforce and anticipated buyer-specific synergies arising from the combination of the Company's and ActoGeniX's technologies.

The Company incurred $418 of acquisition-related costs, of which $381 and $37 is included in selling, general and administrative expenses in the accompanying consolidated statements of operations for the years ended December 31, 2015 and 2014, respectively.

Trans Ova Acquisition

In August 2014, the Company acquired 100% of the membership interests of Trans Ova, a provider of bovine reproductive technologies, pursuant to an Amended and Restated Membership Interest Purchase Agreement (the "Purchase Agreement"). Since the acquisition, Trans Ova has continued its operations. The Company and Trans Ova intend to build upon Trans Ova's current platform with new capabilities with a goal of achieving higher levels of delivered value to dairy and beef cattle producers. Pursuant to the Purchase Agreement, the former members of Trans Ova received an aggregate of 1,444,388 shares of the Company's common stock and $63,625 in cash, and are entitled to receive deferred cash consideration valued at $20,115 in

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exchange for all membership interests of Trans Ova. The first installment of the deferred cash consideration was paid in August 2015 and the remaining payments are due in August 2016 and August 2017. The Purchase Agreement also provides for payment to the former members of Trans Ova a portion of certain cash proceeds in the event there is an award under certain litigation matters pending as of the transaction date to which Trans Ova is a party. The results of Trans Ova's operations subsequent to the acquisition date have been included in the consolidated financial statements, including revenues of $26,352 and net income of $2 for the year ended December 31, 2014.

The fair value of the total consideration transferred, including the noncontrolling interest in a majority-owned subsidiary of Trans Ova, was $127,875. The acquisition date fair value of each class of consideration transferred and noncontrolling interest is presented below:

Cash	$63,625
Common shares	32,802
Deferred cash consideration	20,115
Total consideration transferred	116,542
Fair value of noncontrolling interest	11,333
Total	$127,875

The fair value of the shares of the Company's common stock issued was based on the quoted closing price of the Company's common stock as of the closing date of the acquisition. The estimated fair value of assets acquired and liabilities assumed at the acquisition date is shown in the table below:

Cash	$960
Trade receivables	18,693
Related party receivables	1,219
Inventory	18,476
Prepaid expenses and other	590
Property, plant and equipment	21,164
Intangible assets	23,700
Other non-current assets	147
Total assets acquired	84,949
Accounts payable	3,317
Accrued compensation and benefits	913
Other accrued liabilities	271
Deferred revenue	4,458
Lines of credit	4,091
Related party payables	1,246
Long term debt	9,090
Total liabilities assumed	23,386
Net assets acquired	61,563
Goodwill	66,312
Total consideration and fair value of noncontrolling interest	$127,875

The fair value of acquired inventory was determined using the cost approach, which establishes value based on the cost of reproducing or replacing the asset. The fair value of acquired property, plant and equipment was determined using the cost approach and the market approach. The market approach uses prices and other relevant information generated by market transactions involving identical or comparable assets. The acquired intangible assets include various developed technologies and know-how, customer relationships, and trademarks, and the fair values of these assets were determined using the relief-from-royalty, multi-period excess earnings, and with-and-without methods, which are all variations of the income approach that convert future cash flows to single discounted present value amounts. The acquired intangible assets are being amortized over useful lives ranging from three to nine years. Goodwill, which will be deductible for tax purposes, represents the assembled

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workforce, potential future expansion of Trans Ova business lines and anticipated buyer-specific synergies arising from the combination of the Company's and Trans Ova's technologies.

As a result of a 2012 transaction between Trans Ova and its wholly owned subsidiary, ViaGen, the Company may be obligated to make certain future contingent payments to the former equity holders of ViaGen, up to a total of $5,000 if certain revenue targets, as defined in the share purchase agreement, are met. The Company does not expect these revenue targets to be met and accordingly has assigned no value to this liability.

The Company incurred $713 of costs primarily for legal and due diligence services related to this acquisition, all of which is included in selling, general, and administrative expenses in the accompanying consolidated statement of operations for the year ended December 31, 2014.

In February 2015, the Company acquired, through an exchange offer, the remaining outstanding membership interests of Trans Ova's majority-owned subsidiary, Exemplar, for $1,566 in cash and 307,074 shares of Company common stock.

Medistem Acquisition

In March 2014, the Company acquired 100% of the outstanding common stock and securities convertible into common stock of Medistem, Inc. ("Medistem"), an entity engaged in the development of Endometrial Regenerative Cells ("ERCs"), for a combination of cash and Company common stock. The acquisition allows the Company to employ its synthetic biology platforms to engineer a diverse array of cell-based therapeutic candidates using Medistem's multipotent ERCs. Pursuant to the terms of the merger agreement, Medistem equity holders received 714,144 shares of the Company's common stock and $4,920 in cash in exchange for the outstanding Medistem common stock and securities convertible into common stock. Additionally, Medistem had issued the Company two promissory notes in the amount of $707, including accrued interest, both of which were settled upon closing of the merger. Certain members of Medistem's management surrendered a total of 17,695 shares of their merger consideration to reimburse the Company for required payroll tax withholdings. The results of Medistem's operations subsequent to the acquisition date have been included in the consolidated financial statements.

The fair value of the total consideration transferred was $24,995. The acquisition date fair value of each class of consideration transferred is presented below:

Cash	$4,920
Common shares	19,368
Settlement of promissory notes	707
	$24,995

The fair value of the shares of the Company's common stock issued was based on the quoted closing price of the Company's common stock as of the closing date of acquisition. The estimated fair value of assets acquired and liabilities assumed at the acquisition date is shown in the table below.

Cash	$8
Intangible assets	4,824
Total assets acquired	4,832
Accounts payable	644
Accrued compensation and benefits	67
Other accrued liabilities	50
Total liabilities assumed	761
Net assets acquired	4,071
Goodwill	20,924
Total consideration	$24,995

The fair value of acquired intangible assets was determined using the cost approach. The acquired intangible assets consist of in-process research and development, which is an indefinite-lived intangible asset. The goodwill consists of buyer-specific synergies between the Company's and Medistem's technologies present. The goodwill is not expected to be deductible for tax purposes.

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The Company incurred $680 of acquisition related costs, of which $310 and $370 is included in selling, general and administrative expenses in the accompanying consolidated statements of operations for the years ended December 31, 2014 and 2013, respectively.

Unaudited Condensed Pro Forma Financial Information

The results of operations of the 2015 acquisitions discussed above are included in the consolidated statements of operations beginning on the day after their respective acquisition dates. The following unaudited condensed pro forma financial information for the years ended December 31, 2015 and 2014, is presented as if the acquisitions had been consummated on January 1, 2014:

	Year Ended December 31,	
	2015	2014
	Pro Forma	
Revenues	$174,558	$73,240
Loss before income taxes	(99,751)	(105,085)
Net loss	(99,594)	(104,577)
Net loss attributable to the noncontrolling interests	3,501	3,794
Net loss attributable to Intrexon	(96,093)	(100,783)

The results of operations of the 2014 acquisitions discussed above are included in the consolidated statements of operations beginning on the day after their respective acquisition dates. The following unaudited condensed pro forma financial information for the years ended December 31, 2014 and 2013, is presented as if the acquisitions had been consummated on January 1, 2013:

	Year Ended December 31,	
	2014	2013
	Pro Forma	
Revenues	$119,721	$86,991
Loss before income taxes	(82,041)	(41,718)
Net loss	(81,938)	(41,718)
Net loss attributable to the noncontrolling interests	4,159	2,766
Net loss attributable to Intrexon	(77,779)	(38,952)
Accretion of dividends on redeemable convertible preferred stock	—	(18,391)
Net loss attributable to common shareholders	(77,779)	(57,343)

4. Investments in Joint Ventures

Intrexon Energy Partners II

In December 2015, the Company and certain investors (the "IEPII Investors"), including Harvest, entered into a Limited Liability Company Agreement which governs the affairs and conduct of business of Intrexon Energy Partners II, LLC ("Intrexon Energy Partners II"), a joint venture formed to utilize the Company's natural gas bioconversion platform for the production of 1,4-butanediol, an industrial chemical used to manufacture spandex, polyurethane, plastics, and polyester. The Company also entered into an ECC with Intrexon Energy Partners II which provides exclusive rights to the Company's technology for use in the field, as a result of which the Company received a technology access fee of $18,000 while retaining a 50% membership interest in Intrexon Energy Partners II. The IEPII Investors made initial capital contributions of $18,000, in exchange for pro rata membership interests in Intrexon Energy Partners II totaling 50%. In December 2015, the owners of Intrexon Energy Partners II made a capital contribution of $4,000, half of which was paid by the Company. Intrexon has committed to make additional capital contributions of up to $10,000, and the IEPII Investors, as a group and pro rata in accordance with their respective membership interests in Intrexon Energy Partners II, have committed to make additional capital contributions of up to $10,000, at the request of Intrexon Energy Partners II's board of managers (the "Intrexon Energy Partners II Board") and subject to certain limitations. Intrexon Energy Partners II is governed by the Intrexon Energy Partners II Board which has five members. One member of the Intrexon Energy Partners II Board is designated by the Company and four members are designated by a majority of the IEPII Investors. The Company and the IEPII Investors have the right, but not the

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obligation, to make additional capital contributions above the initial limits when and if solicited by the Intrexon Energy Partners II Board.

The Company's investment in Intrexon Energy Partners II was $2,000 as of December 31, 2015 and is included in investments in affiliates in the accompanying consolidated balance sheet.

Intrexon Energy Partners

In March 2014, the Company and certain investors (the "IEP Investors"), including an affiliate of Third Security, LLC ("Third Security"), entered into a Limited Liability Company Agreement which governs the affairs and conduct of business of Intrexon Energy Partners, LLC ("Intrexon Energy Partners"), a joint venture formed to optimize and scale-up the Company's gas-to-liquid bioconversion platform for the production of certain fuels and lubricants. The Company also entered into an ECC with Intrexon Energy Partners providing exclusive rights to the Company's technology for the use in bioconversion, as a result of which the Company received a technology access fee of $25,000 while retaining a 50% membership interest in Intrexon Energy Partners. The IEP Investors made initial capital contributions, totaling $25,000 in the aggregate, in exchange for pro rata membership interests in Intrexon Energy Partners totaling 50%. In addition, Intrexon has committed to make capital contributions of up to $25,000, and the IEP Investors, as a group and pro rata in accordance with their respective membership interests in Intrexon Energy Partners, have committed to make additional capital contributions of up to $25,000, at the request of Intrexon Energy Partners' board of managers (the "Intrexon Energy Partners Board") and subject to certain limitations. As of December 31, 2015, the Company's remaining commitment was $18,682. Intrexon Energy Partners is governed by the Intrexon Energy Partners Board which has five members. Two members of the Intrexon Energy Partners Board are designated by the Company and three members are designated by a majority of the IEP Investors. The Company and the IEP Investors have the right, but not the obligation, to make additional capital contributions above the initial limits when and if solicited by the Intrexon Energy Partners Board.

The Company's investment in Intrexon Energy Partners was $(1,270) and $(740) as of December 31, 2015 and 2014, respectively, and is included in other accrued liabilities in the accompanying consolidated balance sheets.

OvaXon

In December 2013, the Company and OvaScience, Inc. ("OvaScience"), a life sciences company focused on the discovery, development and commercialization of new treatments for infertility, entered into a Limited Liability Company Agreement ("OvaXon LLC Agreement") to form OvaXon, LLC ("OvaXon"), a joint venture to create new applications for improving human and animal health. Both the Company and OvaScience made an initial capital contribution of $1,500 in January 2014 for a 50% membership interest in OvaXon. OvaXon is governed by the OvaXon board of managers ("OvaXon Board") which has four members, two each from the Company and OvaScience. In cases in which the OvaXon Board determines that additional capital contributions are necessary in order for OvaXon to conduct business and comply with its obligations, each of the Company and OvaScience have the right, but not the obligation, to make additional capital contributions to OvaXon subject to the OvaXon LLC Agreement.

The Company's investment in OvaXon was $(144) and $(83) as of December 31, 2015 and 2014, respectively, and is included in other accrued liabilities in the accompanying consolidated balance sheets.

S & I Ophthalmic

In September 2013, the Company entered into a Limited Liability Company Agreement ("Sun LLC Agreement") with Caraco Pharmaceutical Laboratories, Ltd. ("Sun Pharmaceutical Subsidiary"), an indirect subsidiary of Sun Pharmaceutical Industries Ltd. ("Sun Pharmaceutical"), an international specialty pharmaceutical company focused on chronic diseases, to form S & I Ophthalmic, LLC ("S & I Ophthalmic"). The Sun LLC Agreement governs the affairs and the conduct of business of S & I Ophthalmic. S & I Ophthalmic leverages experience and technology from both the Company and Sun Pharmaceutical. Both the Company and Sun Pharmaceutical Subsidiary made an initial capital contribution of $5,000 in October 2013 for a 50% membership interest in S & I Ophthalmic. S & I Ophthalmic is governed by a board of managers ("S & I Ophthalmic Board") which has four members, two each from the Company and Sun Pharmaceutical Subsidiary. In cases in which the S & I Ophthalmic Board determines that additional capital contributions are necessary in order for S & I Ophthalmic to conduct business and comply with its obligations, each of the Company and Sun Pharmaceutical Subsidiary have committed to making additional capital contributions to S & I

Ophthalmic subject to certain limits defined in the agreement. Each has the right, but not the obligation, to make additional capital contributions above the defined limits when and if solicited by the S & I Ophthalmic Board. As of December 31, 2015, both the Company and Sun Pharmaceutical Subsidiary have made subsequent capital contributions of $5,000.

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Beginning on the seventh anniversary of the effective date of the Sun LLC Agreement, and upon the second anniversary thereafter, the Company, as well as Sun Pharmaceutical Subsidiary, may make a cash offer to purchase all of the other party's interest in S & I Ophthalmic. Upon receipt of such an offer, the other party must either agree to tender its interests at the offered price or submit a counteroffer at a price higher than the original offer. Such offer and counteroffer may continue until one party agrees to the other's price.

The Company's investment in S & I Ophthalmic was $6,379 and $3,220 as of December 31, 2015 and 2014, respectively, and is included in investments in affiliates in the accompanying consolidated balance sheets.

5. Collaboration and Licensing Revenue

The Company's collaborations and licensing agreements provide for multiple deliverables to be delivered by the Company and typically include a license to the Company's technology platforms, participation in collaboration committees, performance of certain research and development services and may include obligations for certain manufacturing services. The Company typically groups these deliverables into two units of accounting based on the nature of the deliverables and the separation criteria. The first deliverable ("Unit of Accounting 1") includes the license to the Company's technology platform, the Company's participation on the collaboration committees and any research and development services associated with its technology platforms. The deliverables for Unit of Accounting 1 are combined because they cannot be individually separated. If applicable, the second deliverable ("Unit of Accounting 2") includes manufacturing services to be provided for any Company materials in an approved product. These services have standalone value and are contingent due to uncertainties on whether an approved product will ever be developed thereby requiring manufacture by the Company at that time. All upfront consideration is allocated to Unit of Accounting 1. Unit of Accounting 2 is determined to be a contingent deliverable at the inception of the collaboration due to the uncertainties surrounding whether an approved product will ever be developed and require manufacturing by the Company. The upfront consideration allocated to Unit of Accounting 1 is recognized over the expected life of the Company's technology platform using a straight-line approach.

The Company recognizes the reimbursement payments received for research and development services in the period when the services are performed and collection is reasonably assured. At the inception of each collaboration, the Company determines whether any milestone payments are substantive and can be recognized when earned. The milestone payments are typically not considered substantive. Royalties related to product sales will be recognized when earned since payments relate directly to products that have been fully developed and for which the Company has satisfied all of its obligations.

The Company determines whether collaborations and licensing agreements are individually significant for disclosure based on a number of factors, including total revenue recorded by the Company pursuant to collaboration and licensing agreements, collaborators or licensees either consolidated or accounted for using the equity method, or other qualitative factors. Collaboration and licensing revenues generated from consolidated subsidiaries are eliminated in consolidation. The following tables summarize the amounts recorded as revenue in the consolidated statements of operations for each significant collaboration and licensing agreement for the years ended December 31, 2015, 2014 and 2013:

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	Year Ended December 31, 2015		
	Revenue Recognized From		
	Upfront and Milestone Payments	Research and Development Services	Total
Ares Trading S.A.	$3,933	$795	$4,728
ZIOPHARM Oncology, Inc.	2,855	16,451	19,306
Oragenics, Inc.	5,679	856	6,535
Fibrocell Science, Inc.	6,046	6,133	12,179
Genopaver, LLC	273	3,556	3,829
S & I Ophthalmic, LLC	—	4,115	4,115
OvaXon, LLC	—	2,540	2,540
Intrexon Energy Partners, LLC	2,500	10,947	13,447
Persea Bio, LLC	500	741	1,241
Thrive Agrobiotics, Inc.	46	220	266
Intrexon Energy Partners II, LLC	167	—	167
Other	10,514	8,954	19,468
Total	$32,513	$55,308	$87,821

	Year Ended December 31, 2014		
	Revenue Recognized From		
	Upfront and Milestone Payments	Research and Development Services	Total
ZIOPHARM Oncology, Inc.	$2,577	$12,044	$14,621
Oragenics, Inc.	1,045	598	1,643
Fibrocell Science, Inc.	1,794	4,398	6,192
Genopaver, LLC	273	1,510	1,783
S & I Ophthalmic, LLC	—	2,832	2,832
OvaXon, LLC	—	2,799	2,799
Intrexon Energy Partners, LLC	1,875	4,227	6,102
Other	2,061	7,179	9,240
Total	$9,625	$35,587	$45,212

	Year Ended December 31, 2013		
	Revenue Recognized From		
	Upfront and Milestone Payments	Research and Development Services	Total
ZIOPHARM Oncology, Inc.	$2,577	$7,818	$10,395
Oragenics, Inc.	673	1,517	2,190
Fibrocell Science, Inc.	970	3,736	4,706
Genopaver, LLC	204	935	1,139
S & I Ophthalmic, LLC	—	417	417
Other	2,520	2,158	4,678
Total	$6,944	$16,581	$23,525

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The following is a summary of the terms of the Company's significant collaborations and licensing agreements.

Merck Licensing Agreement

In March 2015, the Company signed a worldwide License and Collaboration Agreement ("Merck Agreement") with Ares Trading S.A. ("Ares Trading"), a subsidiary of the biopharmaceutical business of Merck KGaA, and ZIOPHARM through which the parties established a collaboration for the research and development and commercialization of certain products for the prophylactic, therapeutic, palliative or diagnostic use for cancer in humans. Pursuant to the Merck Agreement, the Company received a technology access fee of $115,000 as upfront consideration, of which $57,500 was paid to ZIOPHARM in accordance with the terms of the agreement. Upon the selection of the first two targets by Ares Trading, the Company is entitled to receive $10,000 payable in equal quarterly installments over two years, of which $6,250 is included in trade receivables and $2,500 in other long term assets on the consolidated balance sheet as of December 31, 2015. The Company is entitled to receive a further $5,000 for each additional target selected by Ares Trading. The Company is also entitled to up to $413,000 of potential payments for substantive and non-substantive development and commercial milestones for each product, and royalties ranging from the lower-single digits to the low-teens of the net sales derived from the sale of products developed under the Merck Agreement. The Company may also receive up to $50,000 of further cash fees upon certain technical milestones as provided for in the agreement. The term of the Merck Agreement commenced in May 2015 and may be terminated by either party in the event of a material breach as defined in the agreement and may be terminated voluntarily by Ares Trading upon 90 days written notice to the Company. The Company will pay to ZIOPHARM 50% of all payments received for upfront fees, milestones, and royalties under the Merck Agreement.

ZIOPHARM Collaborations

In January 2011, the Company entered into an ECC with ZIOPHARM, a related party. Pursuant to the ECC, ZIOPHARM received a license to the Company's technology platform within the field of oncology as defined more specifically in the agreement. Upon execution of the ECC, the Company received 3,636,926 shares of ZIOPHARM's common stock valued at $17,457 as upfront consideration. In addition to the deliverables discussed above, the Company transferred two clinical product candidates to ZIOPHARM that resulted in a separate unit of accounting for which $1,115 of the upfront consideration was allocated and recognized as collaboration revenue in 2011. The remaining $16,342 of upfront consideration was allocated to Unit of Accounting 1 discussed above. The Company was entitled to additional shares of common stock representing the lesser of (i) the original shares received or (ii) the number of shares representing 7.495% of ZIOPHARM's outstanding shares at the date of the dosing of the first patient in a Phase II clinical trial of a product candidate created, produced or developed by ZIOPHARM using the Company's technology ("ZIOPHARM Milestone"). In October 2012, the ZIOPHARM Milestone was achieved and the Company received 3,636,926 shares of ZIOPHARM's common stock valued at $18,330 as milestone consideration. Since the ZIOPHARM Milestone was not substantive, the Company allocated the ZIOPHARM Milestone to the applicable units of accounting and is recognizing it in a manner similar to these units of accounting. The Company receives reimbursement payments for research and development services provided and manufacturing services for Company materials provided to ZIOPHARM during the ECC. Subject to certain expense allocations, ZIOPHARM will pay the Company 50% of the quarterly net profits derived from the sale of products developed from the ECC, as defined in the agreement. ZIOPHARM is responsible for conducting preclinical and clinical development of product candidates, as well as for other aspects of commercialization or manufacturing of product candidates. The term of the ECC commenced in January 2011 and continues until terminated pursuant to the ECC agreement. The ECC may be terminated by either party in the event of certain material breaches defined in the agreement and may be terminated voluntarily by ZIOPHARM upon 90 days written notice to the Company. In March 2015, in conjunction with the Merck Agreement, the Company and ZIOPHARM amended their existing ECC. The amendment modifies the scope of the ECC in connection with the Merck Agreement and provides that the Company will pay to ZIOPHARM 50% of all payments received for upfront fees, milestones and royalties under the Merck Agreement.

In September 2015, the Company entered into its second ECC with ZIOPHARM ("ZIOPHARM ECC 2"). Pursuant to the ECC, ZIOPHARM received a license to the Company's technology platform to develop and commercialize novel biotherapeutics for the treatment of patients with graft-versus-host disease, or GvHD. Upon execution of ZIOPHARM ECC 2, the Company received a technology access fee of $10,000. The Company receives reimbursement payments

for research and development services provided pursuant to the agreement during the ECC and manufacturing services for Company materials provided to ZIOPHARM during the ECC. ZIOPHARM will pay the Company 50% of quarterly net profits derived from the sale of products developed from ZIOPHARM ECC 2, as defined in the agreement.

ZIOPHARM is responsible for funding the further development of ZIOPHARM ECC 2 products towards the goal of commercialization, conducting preclinical and clinical development of product candidates, as well as for other aspects of commercialization or manufacturing of the product candidates. The term of the ZIOPHARM ECC 2 commenced in September 2015 and may be terminated by either party in the event of certain material breaches defined in the agreement and may be terminated voluntarily by ZIOPHARM upon 90 days written notice to the Company.

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Oragenics Collaborations

In June 2012, the Company entered into an ECC with Oragenics, a publicly traded company focused on becoming the world leader in novel antibiotics against infectious diseases and probiotics for oral health for humans and pets and a related party. Pursuant to the ECC, at the transaction effective date, Oragenics received a license to the Company's technology platform within the field of lantibiotics for the treatment of infectious diseases in humans and companion animals as defined more specifically in the agreement. Upon execution of the ECC, the Company received a technology access fee of 4,392,425 shares of Oragenics' common stock valued at $6,588 as upfront consideration. The Company is entitled to receive additional shares of common stock, or at Oragenics' option, receive a cash payment based upon the fair market value of the shares, upon the separate achievement of certain regulatory milestones of the first product candidate developed from the ECC ("Oragenics ECC 1 Milestones"). The Oragenics ECC 1 Milestones include: (i) 1% of Oragenics' outstanding shares as defined in the ECC agreement at the date of the filing of the first Investigative New Drug Application with the U.S. Food and Drug Administration ("U.S. FDA") for a product candidate created, produced or developed using the Company's technology ("Oragenics ECC 1 Product"); (ii) 1.5% of Oragenics' outstanding shares as defined in the ECC agreement at the date of the dosing of the first patient in the first Phase II clinical trial of an Oragenics ECC 1 Product; (iii) 2% of Oragenics' outstanding shares as defined in the ECC agreement at the date of the dosing of the first patient in the first Phase III clinical trial of an Oragenics ECC 1 Product; (iv) 2.5% of Oragenics' outstanding shares as defined in the ECC agreement at the date of the first New Drug Application or Biologics License Application with the U.S. FDA for an Oragenics ECC 1 Product, or alternatively the first equivalent regulatory filing with a foreign agency; and (v) 3% of Oragenics' outstanding shares as defined in the ECC agreement at the date of the granting of the first regulatory approval of an Oragenics ECC 1 Product. The Company receives reimbursement payments for research and development services provided pursuant to the agreement during the ECC and manufacturing services for Company materials provided to Oragenics during the ECC. Oragenics will pay the Company 25% of the quarterly profits derived from the sale of products developed from the ECC, as defined in the agreement.

Oragenics is responsible for funding the further development of lantibiotics toward the goal of commercialization, conducting preclinical and clinical development of product candidates, as well as for other aspects of commercialization or manufacturing of the product candidates. The term of the ECC commenced in June 2012 and continues until terminated pursuant to the ECC agreement. The ECC may be terminated by either party in the event of certain material breaches defined in the agreement and may be terminated voluntarily by Oragenics upon 90 days written notice to the Company.

In September 2013, the Company entered into its second ECC with Oragenics ("Oragenics ECC 2"). Pursuant to Oragenics ECC 2, at the transaction effective date, Oragenics received a license to the Company's technology platform to develop and commercialize probiotics, specifically the direct administration to humans of genetically modified probiotics for the treatment of diseases of the oral cavity, throat, sinus and esophagus as defined more specifically in the agreement. Upon execution of Oragenics ECC 2, the Company received a technology access fee of 1,348,000 shares of Oragenics' common stock valued at $3,503 and a $1,956 convertible promissory note maturing on or before December 31, 2013 as upfront consideration. Prior to the maturity date, Oragenics had the right to convert the promissory note into shares of Oragenics' common stock subject to its shareholders' approval. The conversion price was equal to the closing price of Oragenics' common stock on the last trading day immediately prior to the date of conversion. In December 2013, Oragenics converted the promissory note into 698,241 shares of Oragenics' common stock. In September 2015, Oragenics and the Company mutually agreed to terminate Oragenics ECC 2 and accordingly, the Company recognized the remaining balance of the deferred revenue associated with the upfront payment.

In June 2015, the Company entered into its third ECC with Oragenics ("Oragenics ECC 3"). Pursuant to Oragenics ECC 3, at the transaction effective date, Oragenics received a license to the Company's technology platform within the field of biotherapeutics for use in certain treatments of oral mucositis and other diseases and conditions of the oral cavity, throat, and esophagus. Upon execution of Oragenics ECC 3, the Company received a technology access fee of a $5,000 convertible promissory note maturing on or before December 31, 2015 as upfront consideration. Prior to the maturity date, Oragenics had the right to convert the promissory note into shares of Oragenics' common stock, subject

to its shareholders' approval. In December 2015, Oragenics converted the promissory note into 3,381,004 shares of Oragenics' common stock. The Company is also entitled to up to $22,000 of potential payments for development and commercial milestones for each Oragenics product developed from Oragenics ECC 3 and up to $10,000 of potential one-time payments for certain regulatory milestones under Oragenics ECC 3. The Company receives reimbursement payments for research and development services provided pursuant to the agreement during the ECC and manufacturing services for Company materials provided to Oragenics during Oragenics ECC 3. Oragenics will pay the Company royalties as a percentage in the low-teens of net sales derived from the sale of products developed from Oragenics ECC 3, as defined in the agreement.

Oragenics is responsible for funding the further development of Oragenics ECC 3 products towards the goal of commercialization, conducting preclinical and clinical development of product candidates, as well as for other aspects of commercialization or manufacturing of the product candidates. The term of Oragenics ECC 3 commenced in June 2015 and

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may be terminated by either party in the event of certain material breaches defined in the agreement and may be terminated voluntarily by Oragenics upon 90 days written notice to the Company.

Fibrocell Science Collaborations

In October 2012, the Company entered into an ECC ("Fibrocell ECC 1") with Fibrocell Science, Inc. ("Fibrocell"), a publicly traded, autologous cellular therapeutic company focused on the development of innovative products for aesthetic, medical and scientific applications and a related party. Pursuant to the ECC, at the transaction effective date, Fibrocell received a license to the Company's technology platform to develop and commercialize genetically modified and non-genetically modified autologous fibroblasts and autologous dermal cells in the United States of America. Upon execution of the ECC, the Company received a technology access fee of 1,317,520 shares of Fibrocell's common stock valued at $7,576 as upfront consideration. The Company receives reimbursement payments for research and development services provided pursuant to the agreement during the ECC and manufacturing services for Company materials provided to Fibrocell during the ECC. On a quarterly basis, Fibrocell will pay the Company royalties of 7% of net sales up to $25,000 and 14% of net sales above $25,000 on each product developed from the ECC, as defined in the agreement. If Fibrocell uses the Company's technology platform to improve the production of a current or new Fibrocell product not developed from the ECC, Fibrocell will pay the Company quarterly royalties equal to 33% of the cost of goods sold savings generated by the improvement, as defined in the agreement.

Fibrocell is responsible for conducting preclinical and clinical development of product candidates associated with Fibrocell ECC 1, as well as for other aspects of commercialization and manufacturing of the product candidates. The term of the ECC commenced in October 2012 and continues until terminated pursuant to the ECC agreement. The ECC may be terminated by either party in the event of certain material breaches defined in the agreement and may be terminated voluntarily by Fibrocell upon 90 days written notice to the Company.

In June 2013, the Company and Fibrocell entered into an amendment to the Fibrocell ECC 1. The amendment expanded the field of use defined in the ECC agreement. Under the terms of the amendment to the Fibrocell ECC 1, the Company received 1,243,781 shares of Fibrocell's common stock valued at $7,612 as a supplemental technology access fee. The Company allocated this additional consideration to the appropriate unit of accounting and is recognizing it consistent with the unit of accounting.

In January 2014, the Company and Fibrocell entered into a second amendment to the Fibrocell ECC 1. The second amendment further expanded the field of use defined in the ECC agreement. Under the terms of the second amendment to the Fibrocell ECC 1, the Company received 1,024,590 shares of Fibrocell's common stock valued at $5,225 as a supplemental technology access fee. The Company allocated this additional consideration to the appropriate unit of accounting. In September 2015, Fibrocell and the Company mutually agreed to terminate the second amendment to the ECC and accordingly, the Company recognized the remaining balance of deferred revenue associated with the related upfront payment.

In December 2015, the Company entered into a second ECC with Fibrocell ("Fibrocell ECC 2"). Pursuant to the ECC, at the transaction effective date, Fibrocell received a license to the Company's technology platform to develop and commercialize genetically-modified fibroblasts to treat chronic inflammatory and degenerative diseases of the joint, including arthritis and related conditions. Upon execution of the ECC, the Company received a technology access fee of $10,000. The Company is also entitled to (i) up to $30,000 of potential one-time payments for certain development and regulatory milestones for the first product developed under Fibrocell ECC 2, (ii) up to $30,000 of potential payments for certain regulatory milestones for each additional product developed under Fibrocell ECC 2, and (iii) up to $22,500 of potential payments for certain sales milestones for each product developed under Fibrocell ECC 2. The Company receives reimbursement payments for research and development services provided pursuant to the agreement during the ECC and manufacturing services for Company materials provided to Fibrocell during the ECC. Fibrocell will pay the Company royalties as a percentage in the low double-digits of net sales derived from the sale of products developed from Fibrocell ECC 2, as defined in the agreement.

Fibrocell is responsible for conducting preclinical and clinical development of product candidates associated with Fibrocell ECC 2, as well as for other aspects of commercialization and manufacturing of the product candidates. The term of the ECC commenced in December 2015 and continues until terminated pursuant to the ECC agreement. The ECC may be terminated by either party in the event of certain material breaches defined in the agreement and may be

terminated voluntarily by Fibrocell upon 90 days written notice to the Company.

Genopaver Collaboration

In March 2013, the Company entered into an ECC with Genopaver, LLC ("Genopaver"), an affiliate of Third Security and a related party. Genopaver was formed for the purpose of entering into the ECC and developing and commercializing products in

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the field of the fermentative production of alkaloids through genetically modified cell-lines and substrate feeds for use as active pharmaceutical ingredients or as commercially sold intermediates in the manufacture of active pharmaceutical ingredients. Upon execution of the ECC, the Company received a technology access fee of $3,000 as upfront consideration. The Company receives reimbursement payments for research and development services provided pursuant to the agreement during the ECC. Genopaver will pay the Company royalties as a percentage in the lower-double digits on the quarterly gross profits of product sales from products developed under the ECC, as defined in the agreement. Genopaver is responsible for the development and commercialization of the product candidates. The term of the ECC commenced in March 2013 and continues until terminated pursuant to the ECC agreement. The ECC may be terminated by either party in the event of certain material breaches defined in the agreement and may be terminated voluntarily by Genopaver upon 90 days written notice to the Company.

AquaBounty Collaboration

In February 2013, the Company entered into an ECC with AquaBounty, a majority owned consolidated subsidiary. The Company will be reimbursed for research and development services as provided for in the ECC agreement. In the event of product sales from a product developed from the ECC, the Company will receive 16.66% of quarterly gross profits for each product, as defined in the agreement. All revenues and expenses related to this ECC are eliminated in consolidation.

S & I Ophthalmic Collaboration

In September 2013, the Company entered into an ECC with S & I Ophthalmic, a joint venture between the Company and Sun Pharmaceutical Subsidiary, an indirect subsidiary of Sun Pharmaceutical, an international specialty pharmaceutical company focused on chronic diseases, and a related party. The ECC grants S & I Ophthalmic an exclusive license to the Company's technology platform to develop and commercialize therapies in humans for the treatment of ocular diseases defined more specifically in the agreement. The Company will be reimbursed for research and development services pursuant to the agreement and manufacturing services for Company materials provided to S & I Ophthalmic during the ECC. Subject to certain expense allocations, S & I Ophthalmic will pay the Company royalties with percentages ranging from mid-single digits and above of the net sales derived from the sale of products developed under the ECC, as defined in the agreement. The term of the ECC commenced in September 2013 and continues until terminated by either party in the event of certain material breaches defined in the agreement and may be terminated voluntarily by S & I Ophthalmic upon 90 days written notice to the Company.

BioPop Collaboration

In October 2013, the Company entered into an ECC with BioPop, a majority owned consolidated subsidiary. The ECC grants BioPop an exclusive license to the Company's technology platform to develop and commercialize artwork, children's toys and novelty goods that are derived from living organisms or are enabled by synthetic biology. The Company will be reimbursed for research and development services and manufacturing services as provided for in the ECC agreement. The Company is entitled to royalties in the mid-single digits as a percentage of the net product sales of a product developed under the ECC, as defined in the agreement. All revenues and expenses related to this ECC are eliminated in consolidation.

OvaXon Collaboration

In December 2013, the Company entered into an ECC with OvaXon, a joint venture between the Company and OvaScience, a life sciences company focused on infertility treatments, and a related party. The ECC grants OvaXon an exclusive license to the Company's technology platform to create new applications for improving human and animal health. OvaScience also licensed certain technology to OvaXon pursuant to a separate license agreement. The Company will be reimbursed for research and development services and manufacturing services as provided for in the ECC agreement. The term of the ECC commenced in December 2013 and continues until terminated by either party in the event of certain material breaches defined in the agreement and may be terminated voluntarily by OvaXon upon 90 days written notice to the Company.

Intrexon Energy Partners Collaboration

In March 2014, the Company entered into an ECC with Intrexon Energy Partners, a joint venture between the Company and certain investors, including an affiliate of Third Security, and a related party. The ECC grants Intrexon Energy Partners an exclusive license to the Company's technology platform to optimize and scale-up the Company's

gas-to-liquid bioconversion platform for the production of certain fuels and lubricants. Upon execution of the ECC, the Company received a technology access fee of $25,000 as upfront consideration. The Company will be reimbursed for research and development services as provided for in the ECC agreement. The term of the ECC commenced in March 2014 and continues until March 2034 unless terminated prior to that date by either party in the event of certain material breaches defined in the agreement and may be terminated voluntarily by Intrexon Energy Partners upon 90 days written notice to the Company.

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Persea Bio Collaboration

In December 2014, the Company entered into an ECC with Persea Bio, LLC ("Persea Bio"), an affiliate of Third Security and a related party. Persea Bio was formed for the purpose of entering into the ECC and developing and commercializing a food program, as defined in the agreement. Upon effectiveness of the ECC, the Company received a technology access fee of $5,000 as upfront consideration. The Company receives reimbursement payments for research and development services provided pursuant to the agreement during the ECC. Persea Bio will pay the Company royalties as a percentage in the lower-double digits on the quarterly gross profits of product sales from products derived from the ECC, as defined in the agreement. Persea Bio is responsible for the development and commercialization of the product candidates. The term of the ECC commenced in December 2014 and continues until terminated by either party in the event of certain material breaches defined in the agreement and may be terminated voluntarily by Persea Bio upon 90 days written notice to the Company.

Thrive Agrobiotics Collaboration

In September 2015, the Company entered into an ECC with Thrive Agrobiotics, an affiliate of Harvest and a related party. Thrive Agrobiotics was formed for the purpose of entering into the ECC and developing and commercializing products to improve the overall growth and feed efficiency in piglets. Upon execution of the ECC, the Company received a technology access fee in the form of equity in Thrive Agrobiotics valued at $1,667 as upfront consideration. The Company is also entitled to up to $5,500 of potential payments for development and commercial milestones for each product developed under the ECC. The Company receives reimbursement payments for research and development services provided pursuant to the agreement during the ECC. Thrive Agrobiotics will pay the Company royalties as a percentage in the lower-double digits on the quarterly gross profits of product sales from products developed under the ECC, as defined in the agreement. Thrive Agrobiotics is responsible for the development and commercialization of the product candidates. The term of the ECC commenced in September 2015 and continues until terminated pursuant to the ECC agreement. The ECC may be terminated by either party in the event of certain material breaches defined in the agreement and may be terminated voluntarily by Thrive Agrobiotics upon 90 days written notice to the Company.

Intrexon Energy Partners II Collaboration

In December 2015, the Company entered into an ECC with Intrexon Energy Partners II, a joint venture between the Company and certain investors, including Harvest, and a related party. Pursuant to the ECC, Intrexon Energy Partners II received an exclusive license to the Company's technology platform to optimize and scale-up the Company's gas-to-liquid bioconversion platform for the production of 1,4-butanediol (BDO), a key chemical intermediate that is used to manufacture spandex, polyurethane, plastics, and polyester. Upon execution of the ECC, the Company received a technology access fee of $18,000 and is entitled to reimbursement of research and development services as provided for in the ECC agreement. The term of the ECC commenced in December 2015 and continues until December 2035; termination prior to that date may be initiated (i) by either party in the event of certain material breaches defined in the agreement or (ii) may be terminated voluntarily by Intrexon Energy Partners II upon 90 days written notice to the Company.

Deferred Revenue

Deferred revenue primarily consists of consideration received for upfront and milestone payments in connection with the Company's collaborations and licensing agreements, prepayments for research and development services performed for collaborators and licensees and prepayments for product and service revenues. Deferred revenue consists of the following:

	December 31,	
	2015	2014
Upfront and milestone payments	$181,331	$107,228
Prepaid research and development services	10,938	1,045
Prepaid product and service revenues	4,759	4,365
Other	701	571
Total	$197,729	$113,209
Current portion of deferred revenue	35,366	16,522

Long-term portion of deferred revenue	162,363	96,687
Total	$197,729	$113,209

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The following table summarizes the remaining balance of deferred revenue associated with upfront and milestone payments for each significant collaboration and licensing agreement:

	December 31,	
	2015	2014
Ares Trading S.A.	$53,567	$—
ZIOPHARM Oncology, Inc.	30,338	23,193
Oragenics, Inc.	8,813	10,010
Fibrocell Science, Inc.	21,445	17,491
Genopaver, LLC	2,250	2,523
Intrexon Energy Partners, LLC	20,625	23,125
Persea Bio, LLC	4,500	5,000
Thrive Agrobiotics, Inc.	1,621	—
Intrexon Energy Partners II, LLC	17,833	—
Other	20,339	25,886
Total	$181,331	$107,228

6. Short-term and Long-term Investments

The Company's investments are classified as available-for-sale. The following table summarizes the amortized cost, gross unrealized gains and losses and fair value of available-for-sale investments as of December 31, 2015:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Aggregate Fair Value
U.S. government debt securities	$208,223	$21	$(540)	$207,704
Certificates of deposit	271	—	—	271
Total	$208,494	$21	$(540)	$207,975

The following table summarizes the amortized cost, gross unrealized gains and losses and fair value of available-for-sale investments as of December 31, 2014:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Aggregate Fair Value
U.S. government debt securities	$115,293	$54	$(12)	$115,335
Certificates of deposit	273	—	—	273
Total	$115,566	$54	$(12)	$115,608

For more information on the Company's method for determining the fair value of its assets, see Note 2 – "Fair Value of Financial Instruments".

The estimated fair value of available-for-sale investments classified by their contractual maturities as of December 31, 2015 was:

Due within one year	$102,528
After one year through two years	105,447
Total	$207,975

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Changes in market interest rates and bond yields cause certain investments to fall below their cost basis, resulting in unrealized losses on investments. The unrealized losses of the Company's investments were primarily the result of unfavorable changes in interest rates subsequent to the initial purchase of these investments and have been in a loss position for less than 12 months.

As of December 31, 2015 and 2014, the Company did not consider any of its investments to be other-than-temporarily impaired. When evaluating its investments for other-than-temporary impairment, the Company reviews factors such as the length of time and extent to which fair value has been below its cost basis, the financial condition of the issuer, the Company's ability and intent to hold the security and whether it is more likely than not that it will be required to sell the investment before recovery of its cost basis.

7. Fair Value Measurements

The carrying amount of cash and cash equivalents, receivables, prepaid expenses and other current assets, accounts payable, accrued compensation and benefits, other accrued liabilities, and related party payables approximate fair value due to the short maturity of these instruments.

The following table presents the placement in the fair value hierarchy of financial assets that are measured at fair value on a recurring basis, including the items for which the fair value option has been elected, at December 31, 2015:

	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	December 31, 2015
Assets				
U.S. government debt securities (Note 6)	$—	$207,704	$—	$207,704
Equity securities (Note 5)	65,850	17,803	—	83,653
Other	—	405	—	405
	$65,850	$225,912	$—	$291,762

The following table presents the placement in the fair value hierarchy of financial assets that are measured at fair value on a recurring basis, including the items for which the fair value option has been elected, at December 31, 2014:

	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	December 31, 2014
Assets				
U.S. government debt securities (Note 6)	$—	$115,335	$—	$115,335
Equity securities (Note 5)	143,927	20,962	—	164,889
Other	—	273	—	273
	$143,927	$136,570	$—	$280,497

The carrying values of the Company's long term debt approximates fair value due to the length of time to maturity and/or the existence of interest rates that approximate prevailing market rates. Financial liabilities measured on a recurring basis were not significant at December 31, 2015 and 2014.

The method used to estimate the fair value of the Level 1 assets in the tables above is based on observable market data as these equity securities are publicly-traded. The method used to estimate the fair value of the Level 2 short-term and long-term investments in the tables above is based on professional pricing sources for identical or comparable instruments, rather than direct observations of quote prices in active markets. The method used to estimate the fair value of the Level 2 equity securities in the tables above is based on the quoted market price of the publicly-traded security, adjusted for a discount for lack of marketability.

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During the year ended December 31, 2015, $8,307 of certain equity securities have been transferred from Level 2 to Level 1 as a result of no longer needing to apply a discount for lack of marketability to these transferred equity securities.

8. Inventory

Inventory consists of the following:

	December 31,	
	2015	2014
Supplies, semen and embryos	$1,402	$1,184
Work in process	6,290	5,637
Livestock	16,907	16,996
Feed	1,964	1,972
Total inventory	$26,563	$25,789

9. Property, Plant and Equipment, Net

Property, plant and equipment consist of the following:

	December 31,	
	2015	2014
Land and land improvements	$9,119	$7,565
Buildings and building improvements	7,520	7,265
Furniture and fixtures	1,283	1,236
Equipment	36,016	31,983
Leasehold improvements	6,888	6,382
Computer hardware and software	5,960	5,060
Construction and other assets in progress	2,193	1,002
	68,979	60,493
Less: Accumulated depreciation and amortization	(26,240)	(22,493)
Property, plant and equipment, net	$42,739	$38,000

Depreciation expense was $7,872, $6,178 and $4,325 for the years ended December 31, 2015, 2014 and 2013, respectively.

10. Goodwill and Intangible Assets, Net

The changes in the carrying amount of goodwill for the years ended December 31, 2015 and 2014, are as follows:

Balance as of December 31, 2013	$13,823
Acquisitions	87,236
Balance as of December 31, 2014	101,059
Acquisitions	67,403
Foreign currency translation adjustment	(3,293)
Balance as of December 31, 2015	$165,169

No goodwill or accumulated impairment losses existed as of December 31, 2015 and 2014.

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Intangible assets consist of the following at December 31, 2015:

	Weighted Average Useful Life (Years)	Gross Carrying Amount	Accumulated Amortization	Net
Patents, related technologies and know-how	14.9	$157,411	$(17,775)	$139,636
Customer relationships	6.5	10,700	(2,739)	7,961
Trademarks	9.3	6,800	(1,018)	5,782
Covenant not to compete	2.0	384	(160)	224
In-process research and development		93,932	—	93,932
Total		$269,227	$(21,692)	$247,535

Intangible assets consist of the following at December 31, 2014:

	Gross Carrying Amount	Accumulated Amortization	Net
Patents, related technologies and know-how	$41,872	$(10,849)	$31,023
Customer relationships	10,700	(806)	9,894
Trademarks	5,900	(298)	5,602
In-process research and development	19,428	—	19,428
Total	$77,900	$(11,953)	$65,947

Amortization expense was $9,871, $4,237 and $2,880 for the years ended December 31, 2015, 2014 and 2013, respectively. Total amortization expense is estimated to be $13,967 for 2016, $13,558 for 2017, $12,915 for 2018, $12,592 for 2019, $12,172 for 2020, and $88,399 for the cumulative period thereafter.

11. Lines of Credit and Long Term Debt

Lines of Credit

Trans Ova has a $6,000 revolving line of credit with First National Bank of Omaha which matures on May 1, 2016. The line of credit bears interest at the greater of 2.95% above the London Interbank Offered Rate or 3.00% and the actual rate was 3.15% at December 31, 2015. As of December 31, 2015, there were no amounts outstanding. The amount available under the line of credit is based on eligible accounts receivable and inventory up to the maximum principal amount. The line of credit is collateralized by certain of Trans Ova's assets and contain certain restricted covenants that include maintaining minimum tangible net worth, maximum allowable annual capital expenditures and working capital. Trans Ova was in compliance with these covenants as of December 31, 2015.

Exemplar has a $700 revolving line of credit with American State Bank which matures on November 1, 2016. The line of credit bears interest at 4.50% per annum. As of December 31, 2015, there was an outstanding balance of $561.

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Long Term Debt

Long term debt consists of the following:

	December 31,	
	2015	2014
Notes payable	$6,477	$7,653
Royalty-based financing	1,807	1,926
Other	244	790
Long term debt	8,528	10,369
Less current portion	930	1,675
Long term debt, less current portion	$7,598	$8,694

Trans Ova has a note payable with American State Bank which matures in April 2033 and has an outstanding principal balance of $5,606 as of December 31, 2015. Trans Ova pays monthly installments of $39, which includes interest at 3.95%. The note payable is collateralized by certain of Trans Ova's real estate and non-real estate assets.

Trans Ova has a note payable with the Iowa Economic Development Authority which matures in July 2016 and has an outstanding principal balance of $366 as of December 31, 2015. Trans Ova pays quarterly installments of $183. The note payable is collateralized by certain of Trans Ova's real estate and project assets financed.

Exemplar has notes payable with outstanding principal balances totaling $505 as of December 31, 2015. Exemplar pays monthly installments ranging from $1 to $4 with interest rates ranging from 0% to 3.00%. These notes mature from September 2018 to May 2020 and are collateralized by certain of Exemplar's real estate or letters of credit of certain of its members.

AquaBounty has a royalty-based financing grant from the Atlantic Canada Opportunities Agency ("ACOA"), a Canadian government agency, to provide funding of a research and development project. The total amount available under the award was $2,070, which AquaBounty claimed over a five year period. All amounts claimed by AquaBounty must be repaid in the form of a 10% royalty on any products commercialized out of this research and development project until fully paid. Because the timing of commercialization is subject to additional regulatory considerations, the timing of repayment is uncertain. As of the acquisition date, AquaBounty had claimed $1,952 of the available funds and this amount was recorded at its acquisition date fair value of $1,107. The Company accretes the difference of $845 between the face value of amounts drawn and the acquisition date fair value over the expected period of repayment. Since the acquisition date, AquaBounty has claimed the remaining balance available under the grant, resulting in total long term debt of $1,807 as of December 31, 2015.

Future maturities of long term debt are as follows:

2016	$930
2017	383
2018	526
2019	341
2020	311
Thereafter	4,230
Total	$6,721

The AquaBounty royalty-based financing grant is not included in the table above due to the uncertainty of the timing of repayment.

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12. Income Taxes

The components of loss before income taxes are presented below:

	Year Ended December 31,		
	2015	2014	2013
Domestic	$(69,287)	$(83,256)	$(39,250)
Foreign	(17,691)	(2,463)	(1,658)
Loss before income taxes	$(86,978)	$(85,719)	$(40,908)

The components of income tax expense (benefit) are presented below:

	Year Ended December 31,		
	2015	2014	2013
U.S. federal income taxes:			
Current	$22	$—	$—
Deferred	1,732	—	—
Foreign income taxes:			
Current	(123)	(103)	—
Deferred	(1,003)	—	—
State income taxes:			
Deferred	388	—	—
Income tax expense (benefit)	$1,016	$(103)	$—

Income tax expense (benefit) for the years ended December 31, 2015, 2014 and 2013 differed from amounts computed by applying the applicable U.S. federal corporate income tax rate of 34% to loss before income taxes as a result of the following:

	2015	2014	2013
Computed statutory income tax benefit	$(29,573)	$(29,144)	$(13,909)
State and provincial income tax benefit, net of federal income taxes	(3,157)	(3,544)	(1,834)
Nondeductible stock based compensation	3,182	1,386	575
Nondeductible officer compensation	2,433	—	—
Contribution of services by shareholder	—	677	527
Gain on previously held equity investment	—	—	(2,477)
Research and development tax incentives	(348)	258	(1,203)
Acquisition-related transaction costs	883	—	—
Enacted change in tax rates	(961)	—	—
U.S.-foreign rate differential	620	—	—
Other, net	(98)	1,503	1,317
	(27,019)	(28,864)	(17,004)
Change in valuation allowance for deferred tax assets	28,035	28,761	17,004
Total income tax expense (benefit)	$1,016	$(103)	$—

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The tax effects of temporary differences that comprise the deferred tax assets and liabilities at December 31, 2015 and 2014, are as follows:

	2015	2014
Deferred tax assets		
Allowance for doubtful accounts	$1,056	$783
Inventory	967	—
Equity securities and investments in affiliates	10,413	4,694
Property, plant and equipment	—	79
Accrued liabilities and long-term debt	4,585	2,703
Stock-based compensation	7,223	8,283
Deferred revenue	31,637	43,774
Research and development tax credits	9,113	9,661
Net operating loss carryforwards	135,633	103,114
Total deferred tax assets	200,627	173,091
Less: Valuation allowance	190,174	161,660
Net deferred tax assets	10,453	11,431
Deferred tax liabilities		
Property, plant and equipment	160	—
Intangible assets	32,095	11,431
Total deferred tax liabilities	32,255	11,431
Net deferred tax assets (liabilities)	$(21,802)	$—

Activity within the valuation allowance for deferred tax assets during the years ended December 31, 2015, 2014 and 2013 was as follows:

	2015	2014	2013
Valuation allowance at beginning of year	$161,660	$131,985	$113,051
Increase (decrease) in valuation allowance as a result of			
Mergers and acquisitions, net	1,228	914	1,930
Current year operations	28,035	28,761	17,004
Foreign currency translation adjustment	(749)	—	—
Valuation allowance at end of year	$190,174	$161,660	$131,985

In assessing the realizability of deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible. Management considers the scheduled reversal of deferred tax liabilities, projected future taxable income and tax planning strategies in making this assessment. Due to the Company and its subsidiaries' histories of net losses incurred from inception, any corresponding net domestic and certain foreign deferred tax assets have been fully reserved as the Company and its subsidiaries cannot sufficiently be assured that these deferred tax assets will be realized. The components of the deferred tax assets and liabilities as of the date of the mergers and acquisitions by the Company prior to consideration of the valuation allowance are substantially similar to the components of deferred tax assets presented herein.

The American Taxpayer Relief Act of 2012, which retroactively reinstated the federal research and development tax credit for 2012, was not enacted into law until January 2013. Therefore, the deferred tax asset and corresponding increase in the valuation allowance for the amount of the tax credit generated in 2012 are reflected in 2013 for financial statement purposes.

The Company's past issuances of stock and mergers and acquisitions have resulted in ownership changes as defined in Section 382 of the Internal Revenue Code of 1986, as amended ("Section 382"). As a result, utilization of portions of the net operating losses may be subject to annual limitations. As of December 31, 2015, approximately $16,400 of the Company's domestic net operating losses generated prior to 2008 are limited by Section 382 to annual usage limits of approximately

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$1,500. As of December 31, 2015, approximately $19,100 of the Company's domestic net operating losses were inherited via acquisition and are limited based on the value of the target at the time of the transaction.

At December 31, 2015, the Company has loss carryforwards for federal income tax purposes of approximately $248,669 available to offset future taxable income and federal and state research and development tax credits of $6,770, prior to consideration of annual limitations that may be imposed under Section 382. These carryforwards will begin to expire in 2022. Of these loss carryforwards, $27,851 relate to benefits from stock compensation deductions that will be recorded as a component of paid-in capital when realized. The Company's direct foreign subsidiaries have foreign loss carryforwards of approximately $109,743, most of which do not expire.

The Company does not record deferred taxes on the undistributed earnings of its direct foreign subsidiaries because it does not expect the temporary differences related to those unremitted earnings to reverse in the foreseeable future. At December 31, 2015, the Company's direct foreign subsidiaries had accumulated deficits of approximately $2,804. Future distributions of accumulated earnings of the Company's direct foreign subsidiaries may be subject to U.S. income and foreign withholding taxes.

The Company does not file a consolidated income tax return with AquaBounty or BioPop. At December 31, 2015, AquaBounty has loss carryforwards for federal and foreign income tax purposes of approximately $17,100 and $10,900, respectively, and foreign tax credits of approximately $2,200 available to offset future taxable income, prior to consideration of annual limitations that may be imposed under Section 382 or analogous foreign provisions. These carryforwards will begin to expire in 2018. As a result of the Company's ownership in AquaBounty passing 50% in 2013, an annual Section 382 of approximately $900 per year will apply to domestic losses and credits carried forward by AquaBounty from prior years, which are also subject to prior Section 382 limitations. At December 31, 2015, BioPop had loss carryforwards of approximately $1,400 for federal income tax purposes available to offset future taxable income.

The Company and its subsidiaries do not have material unrecognized tax benefits as of December 31, 2015. The Company does not anticipate significant changes in the amount of unrecognized tax benefits in the next 12 months. The Company's tax returns for years 2004 and forward are subject to examination by federal or state tax authorities due to the carryforward of unutilized net operating losses and research and development tax credits.

13. Redeemable Convertible Preferred Stock and Shareholders' Equity

Redeemable Convertible Preferred Stock

The tables below represent a rollforward of the Redeemable Convertible Preferred Stock:

	Series A Redeemable Convertible Preferred Stock		Series B Redeemable Convertible Preferred Stock		Series B-1 Redeemable Convertible Preferred Stock	
	Shares	Amount	Shares	Amount	Shares	Amount
Balances at December 31, 2012	705,400	$1,358	694,000	$669	1,212,360	$1,360
Accretion of dividends	—	52	—	19	—	37
Conversion to common stock	(705,400)	(1,410)	(694,000)	(688)	(1,212,360)	(1,397)
Balances at December 31, 2013	—	$—	—	$—	—	$—

	Series C Redeemable Convertible Preferred Stock		Series C-1 Redeemable Convertible Preferred Stock		Series C-2 Redeemable Convertible Preferred Stock	
	Shares	Amount	Shares	Amount	Shares	Amount
Balances at December 31, 2012	4,546,360	$7,134	15,934,528	$34,201	18,617,020	$44,512
Accretion of dividends	—	266	—	1,272	—	1,660
Conversion to common stock	(4,546,360)	(7,400)	(15,934,528)	(35,473)	(18,617,020)	(46,172)
Balances at December 31, 2013	—	$—	—	$—	—	$—

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	Series C-3 Redeemable Convertible Preferred Stock		Series D Redeemable Convertible Preferred Stock		Series E Redeemable Convertible Preferred Stock	
	Shares	Amount	Shares	Amount	Shares	Amount
Balances at December 31, 2012	13,297,872	$29,770	19,803,685	$76,252	38,095,239	$211,403
Accretion of dividends	—	1,103	—	2,827	—	7,931
Conversion to common stock	(13,297,872)	(30,873)	(19,803,685)	(79,078)	(38,095,239)	(219,332)
Settlement of fractional shares upon conversion to common stock	—	—	—	(1)	—	(2)
Balances at December 31, 2013	—	$—	—	$—	—	$—

	Series F Redeemable Convertible Preferred Stock	
	Shares	Amount
Balances at December 31, 2012	—	$—
Issuance of shares	19,047,619	150,000
Accretion of dividends	—	3,224
Stock issuance costs	—	(3,148)
Conversion to common stock	(19,047,619)	(150,075)
Settlement of fractional shares upon conversion to common stock	—	(1)
Balances at December 31, 2013	—	$—

The Series F Redeemable Convertible Preferred Stock ("Series F"), Series E Redeemable Convertible Preferred Stock ("Series E"), Series D Redeemable Convertible Preferred Stock ("Series D"), Series C-3 Redeemable Convertible Preferred Stock ("Series C-3"), Series C-2 Redeemable Convertible Preferred Stock ("Series C-2"), Series C-1 Redeemable Convertible Preferred Stock ("Series C-1"), Series C Redeemable Convertible Preferred Stock ("Series C"), Series B-1 Redeemable Convertible Preferred Stock ("Series B-1"), Series B Redeemable Convertible Preferred Stock ("Series B") and Series A Redeemable Convertible Preferred Stock ("Series A") collectively are referred to as the "Series Preferred".

Upon closing of the IPO on August 13, 2013, all Series Preferred shares, including $68,850 of accrued but unpaid dividends thereon, automatically converted into 79,705,130 shares of common stock. Prior to conversion, the Series Preferred had optional redemption provisions whereby after May 25, 2016, but prior to the occurrence of a qualified IPO, the holders of greater than three-fourths of then issued and outstanding shares of the Series F, Series E, Series D, Series C-3, Series C-2, Series C-1 and Series C, voting as a separate class, could have elected by written notice to require the Company to redeem all of the then issued and outstanding shares of Series F, Series E, Series D, Series C-3, Series C-2, Series C-1 and Series C at an amount equal to the stated price adjusted for any stock dividends, combination or splits plus all accrued but unpaid dividends. Upon receipt of such written notice, the Company must notify the holders of the Series B-1, Series B and Series A of the redemption notice, upon which the holders of each of those classes could have required the Company to redeem all of the then issued and outstanding shares of such class. As a result of this optional redemption provision, the Company accreted changes in the redemption value from the date of issuance of all Series Preferred shares with a resultant change to additional paid-in capital or accumulated deficit in the absence of additional paid-in capital.

Issuances of Common Stock

In August 2015, the Company closed a public offering of 5,609,756 shares of its common stock, the aggregate proceeds of which were $218,193, net of underwriting discounts of $11,500 and offering expenses paid by the Company of approximately $306, all of which were capitalized.

In January 2015, the Company closed a public offering of 4,312,500 shares of its common stock, including 555,556 shares of common stock purchased by affiliates of Third Security. The aggregate proceeds of the offering were $110,041, net of underwriting discounts and commissions of $6,086 and offering expenses paid by the Company of approximately $311, all of which were capitalized.

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In March 2014 and concurrent with the formation of Intrexon Energy Partners, the Company entered into securities purchase agreements with each of the IEP Investors in Intrexon Energy Partners for the private placement of 972,004 shares of the Company's common stock for gross proceeds of $25,000. Each IEP Investor purchased an amount proportionate to its investment in Intrexon Energy Partners, including 243,001 shares, or $6,250, purchased by an affiliate of Third Security.

Dividend to Shareholders

In June 2015, the Company distributed to its shareholders 17,830,305 shares of ZIOPHARM common stock, representing all of the equity interests of ZIOPHARM held by the Company and resulting in a realized gain of $81,401. The distribution constituted a dividend to shareholders of record as of June 4, 2015. In connection with the distribution, pursuant to the terms of the Company's equity incentive plans, the conversion terms of all outstanding options for shares of the Company's common stock as of June 4, 2015 were adjusted to reflect the value of the distribution with respect to shares of the Company's common stock by decreasing the exercise prices and increasing the number of shares. This adjustment resulted in 312,795 additional shares at a weighted average exercise price of $25.40.

Components of Accumulated Other Comprehensive Loss

The components of accumulated other comprehensive loss are as follows:

	December 31,	
	2015	2014
Unrealized gain (loss) on investments	$(519)	$42
Foreign currency translation adjustments	(12,233)	(46)
Total accumulated other comprehensive loss	$(12,752)	$(4)

14. Share-Based Payments

The Company records the fair value of stock options issued to employees and non-employees as of the grant date as stock-based compensation expense. Stock-based compensation expense for employees and non-employees is recognized over the requisite service period, which is typically the vesting period. Stock-based compensation costs included in the consolidated statements of operations are presented below:

	Year Ended December 31,		
	2015	2014	2013
Cost of products	$95	$14	$—
Cost of services	354	142	—
Research and development	8,614	4,817	514
Selling, general and administrative	29,604	16,876	2,407
Total	$38,667	$21,849	$2,921

Intrexon Stock Option Plans

In April 2008, Intrexon adopted the 2008 Equity Incentive Plan (the "2008 Plan") for employees and nonemployees pursuant to which Intrexon's board of directors may grant share based awards, including stock options, to officers, key employees and nonemployees. Upon the effectiveness of the 2013 Omnibus Incentive Plan (the "2013 Plan"), no new awards may be granted under the 2008 Plan. As of December 31, 2015, there were 1,261,192 stock options outstanding under the 2008 Plan.

Intrexon adopted the 2013 Plan for employees and nonemployees pursuant to which Intrexon's board of directors may grant share based awards, including stock options and shares of common stock, to employees, officers, consultants, advisors, and nonemployee directors. The 2013 Plan became effective upon the closing of the of the Company's initial public offering in August 2013, and as of December 31, 2015, there were 13,000,000 shares authorized for issuance under the 2013 Plan, of which 9,782,336 stock options were outstanding and 2,534,542 shares were available for grant.

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Stock options may be granted with an exercise price equal to or greater than the stock's fair market value at the date of grant. Stock options may be granted with an exercise price less than the stock's fair market value at the date of grant if the stock options are replacement options in accordance with certain U.S. Treasury regulations. Virtually all stock options have ten-year terms and vest four years from the date of grant.

Stock option activity under Intrexon's award plans was as follows for the periods presented:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (Years)
Balances at December 31, 2012	2,313,526	$5.90	7.87
Granted	989,709	13.06	
Exercised	(88,764)	(6.04)	
Forfeited	(335,746)	(6.94)	
Expired	(38,077)	(5.17)	
Balances at December 31, 2013	2,840,648	8.27	7.75
Granted	7,655,050	27.51	
Exercised	(315,964)	(4.80)	
Forfeited	(1,855,578)	(24.00)	
Expired	(612)	(7.12)	
Balances at December 31, 2014	8,323,544	22.59	8.64
Granted	5,051,500	45.82	
Adjustment due to dividend (Note 13)	312,795	25.40	
Exercised	(1,029,291)	(15.16)	
Forfeited	(1,610,335)	(26.75)	
Expired	(4,685)	(28.29)	
Balances at December 31, 2015	11,043,528	32.66	8.49
Exercisable at December 31, 2015	2,494,426	18.31	6.82
Vested and Expected to Vest at December 31, 2015(1)	9,235,535	31.52	8.13

(1) The number of stock options expected to vest takes into account an estimate of expected forfeitures.

Total unrecognized compensation costs related to unvested awards at December 31, 2015, 2014 and 2013 were $113,655, $62,281 and $9,639, respectively, and are expected to be recognized over a weighted-average period of approximately three years.

The weighted average grant date fair value of options granted during 2015, 2014 and 2013 was $25.96, $16.40 and $12.91, respectively. The aggregate intrinsic value of options exercised during 2015, 2014 and 2013 was $24,675, $6,350 and $1,136, respectively. The aggregate intrinsic value of options is calculated as the difference between the exercise price of the underlying options and the fair value of Intrexon's common stock for those shares where the exercise price was lower than the fair value of Intrexon's common stock on the date of exercise.

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The following table summarizes additional information about stock options outstanding as of December 31, 2015:

	Options Outstanding				Options Exercisable			
Range of Exercise Prices	Number of Options	Weighted Average Exercise Price	Weighted Average Remaining Life (Years)	Aggregate Intrinsic Value	Number of Options	Weighted Average Exercise Price	Weighted Average Remaining Life (Years)	Aggregate Intrinsic Value
$0.38 — $9.34	1,261,192	$6.40	5.40	$29,956	1,147,978	$6.19	5.25	$27,507
$15.21 — $28.93	2,682,516	24.25	8.43	15,831	602,023	24.43	8.36	3,445
$29.14 — $29.68	2,895,885	29.63	8.44	1,508	635,743	29.68	7.99	299
$30.10 — $56.77	3,118,935	44.48	9.46	—	108,682	45.87	8.02	—
$57.95 — $65.34	1,085,000	58.07	9.55	—	—	—	—	—
	11,043,528	$32.66	8.49	$47,295	2,494,426	$18.31	6.82	$31,251

The following table summarizes additional information about stock options outstanding as of December 31, 2014:

	Options Outstanding				Options Exercisable			
Range of Exercise Prices	Number of Options	Weighted Average Exercise Price	Weighted Average Remaining Life (Years)	Aggregate Intrinsic Value	Number of Options	Weighted Average Exercise Price	Weighted Average Remaining Life (Years)	Aggregate Intrinsic Value
$0.39 — $9.67	1,747,494	$6.49	6.25	$36,772	1,293,184	$6.07	5.90	$27,746
$15.39 — $22.77	2,603,300	21.74	9.32	15,084	57,000	19.77	9.05	442
$24.73 — $28.69	260,750	26.21	9.74	363	8,250	28.25	8.63	1
$29.95	1,000,000	29.95	9.21	—	—	—	—	—
$30.72	2,712,000	30.72	9.22	—	90,000	30.72	9.22	—
	8,323,544	$22.59	8.64	$52,219	1,448,434	$8.27	6.25	$28,189

Intrexon currently uses authorized and unissued shares to satisfy share award exercises.

In October 2015, the Compensation Committee and the independent members of the Intrexon Board of Directors approved a compensation arrangement whereby the Company's Chief Executive Officer ("CEO") would receive a monthly salary. Previously, the CEO did not receive compensation for his services as an employee of the Company other than through his participation in the Company's Annual Executive Incentive Plan which became effective January 1, 2015 (Note 17). Pursuant to the compensation agreement, the CEO receives a base salary of $200 per month payable in fully-vested shares of Intrexon common stock with such shares subject to a three year lock-up on resale. The monthly number of shares of common stock is calculated based on the closing price on the last trading day of each month and the shares are issued pursuant to the terms of a Restricted Stock Unit Agreement (the "RSU Agreement") which was executed between Intrexon and the CEO pursuant to the terms of the 2013 Plan. The RSU Agreement became effective in November 2015, has an initial term of 12 months, and is renewable annually at the discretion of the Board of Directors of the Company. The fair value of the shares issued as compensation for services is included in selling, general, and administrative expenses in the Company's consolidated statement of operations for the year ended December 31, 2015 and totaled $314.

Prior to 2015, the CEO did not receive compensation for his services as CEO, and as a result, the Company recorded $1,991 and $1,550 in compensation expense for the years ended December 31, 2014 and 2013, respectively, based on the estimated salary and benefits appropriate for the role.

Other Plans

As of December 31, 2015, there were 5,382,000 options, which are exercisable into shares of AquaBounty common stock, outstanding under the AquaBounty 2006 Equity Incentive Plan at a weighted average exercise price of $0.26 per share of which 4,320,333 were exercisable. As of December 31, 2014, there were 7,347,000 options outstanding under the AquaBounty 2006 Equity Incentive Plan at a weighted average exercise price of $0.31 per share of which 6,171,520 were exercisable.

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15. License Agreement

In January 2015, the Company and ZIOPHARM jointly entered into a license agreement with the University of Texas System Board of Regents on behalf of the University of Texas MD Anderson Cancer Center ("MD Anderson") whereby the Company received an exclusive license to certain research and development technologies owned and licensed by MD Anderson, including technologies relating to novel chimeric antigen receptor (CAR) T-cell therapies, as well as co-licenses and non-exclusive licenses to certain other related technologies. ZIOPHARM shall receive access to these technologies pursuant to the terms of the Company's ECC with ZIOPHARM. The Company issued 2,100,085 shares of its common stock valued at $59,579 to MD Anderson as consideration, which is included in research and development expenses in the accompanying consolidated statement of operations for the year ended December 31, 2015. Subject to certain exceptions, the license agreement expires on the last to occur of (i) the expiration of all patents licensed thereunder, or (ii) the twentieth anniversary of the date of the license agreement.

In connection with the license agreement, the Company, ZIOPHARM, and MD Anderson entered into a research and development agreement which governs certain operational activities between the parties and pursuant to which ZIOPHARM will provide funding for certain research and development activities of MD Anderson for a period of three years, in an amount between $15,000 and $20,000 per year. The Company and ZIOPHARM are obligated to reimburse MD Anderson for out of pocket expenses for maintaining patents covering the licensed technologies.

16. Commitments and Contingencies

Operating Leases

The Company leases certain facilities and equipment under noncancelable operating leases. The equipment leases are renewable at the option of the Company. At December 31, 2015, future minimum lease payments under operating leases having initial or remaining noncancelable lease terms in excess of one year are as follows:

2016	$4,136
2017	3,837
2018	2,317
2019	2,129
2020	2,182
Thereafter	1,606
	$16,207

Rent expense, including other facility expenses, was $8,610, $8,511 and $5,672 in 2015, 2014 and 2013, respectively. The Company maintains subleases for certain of its facilities. Rental income under sublease agreements was $1,486, $908 and $365 for the years ended December 31, 2015, 2014 and 2013, respectively. Future rental income is expected to be $741 for 2016 and $96 for 2017.

Contingencies

In March 2012, Trans Ova was named as a defendant in a licensing and patent infringement suit brought by XY, LLC alleging that certain of Trans Ova's activities breach a licensing agreement and infringe on patents that XY, LLC allegedly owns. Trans Ova filed a number of counterclaims in the case. The matter proceeded to a jury trial in January 2016 and in February 2016, the jury determined that XY, LLC and Trans Ova had each breached the licensing agreement, and that Trans Ova had infringed the intellectual property of XY, LLC. The Company and Trans Ova believe they have compelling grounds to overturn the adverse findings of the jury either prior to the judge's final ruling on the case or through appellate actions and that, as a result, the amount of damages could be reduced or eliminated. Trans Ova could, however, elect to enter into a settlement agreement in order to avoid the further costs and uncertainties of litigation, to obtain a license to XY, LLC's technologies, or to recover monetary damages related to Trans Ova's antitrust counterclaims. The jury awarded damages to XY, LLC in the amount of $6,066 which amount may subsequently be increased by virtue of attorneys' fees or punitive damages. The jury awarded damages to Trans Ova in the amount of $528 and did not award damages on any other of Trans Ova's counterclaims. Since the inception of the license, Trans Ova has remitted payments to XY, LLC pursuant to the terms of the license agreement and has recorded these payments in cost of services in the consolidated statements of operations for the respective periods. For the period from inception of the agreement through December 31, 2015, aggregate payments due were $3,270, of which $2,859 had not yet been deposited by XY, LLC. Because of the uncertainty of the outcome of the final

judgment and any subsequent

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appeals, it is not reasonably possible to predict the outcome of this litigation, nor is it reasonably possible to provide an estimate of the reasonably possible gain or loss which may arise as a result thereof.

The Company may become subject to other claims and assessments from time to time in the ordinary course of business. Such matters are subject to many uncertainties and outcomes are not predictable with assurance. The Company accrues liabilities for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated. As of December 31, 2015 and 2014, the Company does not believe that any such matters, individually or in the aggregate, will have a material adverse effect on the Company's business, financial condition, results of operations, or cash flows.

17. Related Party Transactions

Third Security and Affiliates

The Company's CEO and Chairman of the Board of Directors of the Company is also the manager of Third Security. Certain affiliates of Third Security were shareholders of the Series B, B-1, C, C-1, C-2, C-3, D, E, and F Redeemable Convertible Preferred Stock.

In November 2015, the Board of Directors of the Company approved the execution of a Services Agreement ("Services Agreement") with Third Security pursuant to which Third Security provides the Company with certain professional, legal, financial, administrative, and other support services necessary to support the Company and its CEO. As consideration for providing these services, Third Security is entitled to a fee of $800 per month to be paid in the form of fully-vested shares of the Company's common stock. The number of shares of common stock is calculated based on the closing price of the Company's common stock on the 15th day of each month. The payments made by the Company under the Services Agreement constitute, in the aggregate, an award under the 2013 Plan and are subject to the terms of the 2013 Plan (Note 14). The Services Agreement has a term of one year, can be terminated by the Company at any time, and may be extended only by agreement of the parties, including approval of a majority of the independent members of the Company's Board of Directors. For the year ended December 31, 2015, the Company issued 48,678 shares with a value of $1,375 to Third Security as payment for services pursuant to the Services Agreement. In addition to the foregoing Services Agreement, the Company reimburses Third Security for certain administrative services and out-of-pocket expenses incurred on the Company's behalf and the total fair value of expenses incurred by the Company under this arrangement was $428, $291, and $455, for the years ended December 31, 2015, 2014 and 2013, respectively.

See also Note 14 regarding compensation arrangements between the Company and its CEO.

Transactions with ECC Parties

In addition to entities controlled by Third Security, any entity in which the Company holds equity securities, including securities received as upfront or milestone consideration, and which also are party to a collaboration with the Company are considered to be related parties.

In July 2015, the Company purchased 375,868 shares of common stock of Fibrocell at $5.80 per share.

In March 2015, the Company purchased 278,788 shares of common stock of AmpliPhi Biosciences Corporation ("AmpliPhi"), a collaborator, and 69,696 warrants for $2,300. Of the total purchase price, $1,979 was allocated to the value of the shares of common stock and $321 was allocated to the value of the warrants. The number of shares and warrants received reflects a 1-for-50 reverse stock split of AmpliPhi's common stock effective August 7, 2015. The AmpliPhi warrants have been included in other assets on the consolidated balance sheet with a value of $134 as of December 31, 2015.

Between February 2011 and February 2015, the Company purchased $43,582 of ZIOPHARM securities. See Note 13 for additional discussion related to the Company's investment in ZIOPHARM.

The Company entered into an ECC with Histogenics Corporation ("Histogenics") in September 2014 and received a $10,000 convertible promissory note as upfront consideration. The note originally matured in September 2015 and accrued interest at 6.0% per annum. Upon the closing of Histogenics' IPO in December 2014, the note, with accrued interest, was converted to Histogenics common stock. Additionally, the Company purchased 1,772,364 shares of Histogenics common stock at $11.00 per share in the IPO.

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In conjunction with the ECC with Oragenics, the Company is entitled to, at its election, purchase up to 30% of securities offerings that may be conducted by Oragenics in the future, subject to certain conditions and limitations. In November 2013, the Company purchased 1,100,000 shares of Oragenics common stock at $2.50 per share. In September 2013, the Company purchased 1,300,000 shares of Oragenics common stock at $3.00 per share in a private transaction. In connection with Oragenics ECC 3, the Company agreed to purchase additional common stock in a qualified financing, as defined in the agreement, during the sixteen months following the effective date of the Oragenics ECC 3 in an amount up to the lesser of (i) the amount that is the proportion of such financing equal to the Company's pro rata equity holdings in Oragenics as of the effective date and (ii) $10,000, subject to certain conditions. The Company recognized $77,354, $41,030, and $22,783 of collaboration revenues from related parties in the years ended December 31, 2015, 2014 and 2013, respectively.

Other Related Parties

In June 2015, the Company entered into an agreement with Harvest, an investment fund sponsored by Harvest Capital Strategies, LLC, and a related party based on ownership in the fund by affiliates of Third Security. Harvest was established to invest in life science research and development start-up opportunities offered by Intrexon to Harvest. For such start-up opportunities, the Company will provide Harvest with exclusive rights of first-look and first negotiation. For any opportunities it decides to pursue, Harvest would establish new collaboration entities which would enter into an ECC with the Company in a designated field. The terms of each ECC would be negotiated between the Company and Harvest. In addition, the agreement provides the Company the right to present to Harvest non-exclusive opportunities to invest in other ventures, including investment opportunities with respect to the Company's existing collaborations. The agreement with Harvest does not limit the Company's ability to execute other collaborations and joint ventures with third parties. As consideration for providing exclusive rights of first look and first negotiation for start-up opportunities, the Company receives a portion of the management fee collected by the fund sponsor of Harvest. These fees are included in other income in the accompanying consolidated statements of operations and totaled $1,349 for the year ended December 31, 2015.

18. Net Loss per Share

The following table presents the historical computation of basic and diluted net loss per share:

	2015	2014	2013
Historical net loss per share:			
Numerator:			
Net loss attributable to Intrexon	$(84,493)	$(81,822)	$(38,980)
Add: Accretion of dividends on redeemable convertible preferred stock	—	—	(18,391)
Net loss attributable to common shareholders	$(84,493)	$(81,822)	$(57,371)
Denominator:			
Weighted average shares outstanding, basic and diluted	111,066,352	99,170,653	40,951,952
Net loss attributable to common shareholders per share, basic and diluted	$(0.76)	$(0.83)	$(1.40)

The following potentially dilutive securities as of December 31, 2015, 2014, and 2013, have been excluded from the computations of diluted weighted average shares outstanding for the years then ended as they would have been anti-dilutive:

	December 31,		
	2015	2014	2013
Options	11,043,528	8,323,544	2,840,648
Warrants	194,719	352,483	414,404
Total	11,238,247	8,676,027	3,255,052

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In addition to the potentially dilutive securities in the table above, Series Preferred cumulative dividends convertible into common shares at a price per share equal to the fair market value of a common share at the time of conversion have been excluded from the computation of diluted weighted-average shares outstanding for the year ended December 31, 2013.

19. Quarterly Financial Information (Unaudited)

The following information has been derived from unaudited consolidated statements that, in the opinion of management, include all recurring adjustments necessary for a fair statement of such information.

	Three Months Ended			
	March 31, 2015	June 30, 2015	September 30, 2015	December 31, 2015
Total revenues	$33,849	$44,891	$53,367	$41,498
Operating loss	(87,123)	(17,430)	(7,916)	(34,395)
Net income (loss)	25,804	(41,494)	(39,029)	(33,275)
Net income (loss) attributable to Intrexon	27,097	(40,663)	(38,213)	(32,714)
Net income (loss) attributable to common shareholders per share, basic	$0.26	$(0.37)	$(0.34)	$(0.28)
Net income (loss) attributable to common shareholders per share, diluted	0.25	(0.37)	(0.34)	(0.28)

	Three Months Ended			
	March 31, 2014	June 30, 2014	September 30, 2014	December 31, 2014
Total revenues	$7,854	$11,787	$21,197	$31,092
Operating loss	(17,872)	(18,082)	(15,047)	(18,961)
Net income (loss)	3,249	(52,935)	(53,862)	17,932
Net income (loss) attributable to Intrexon	4,115	(52,043)	(52,725)	18,831
Net income (loss) attributable to common shareholders per share, basic	$0.04	$(0.53)	$(0.53)	$0.19
Net income (loss) attributable to common shareholders per share, diluted	0.04	(0.53)	(0.53)	0.18

20. Defined Contribution Plans

The Company sponsors defined contribution plans covering employees who meet certain eligibility requirements. The Company makes contributions to the plans in accordance with terms specified in the plan agreement. The Company's contributions to the plans were $1,157, $776 and $598 in 2015, 2014 and 2013, respectively.

21. Subsequent Events

In February 2016, the Company acquired substantially all of the assets of EnviroFlight, LLC ("EnviroFlight") for approximately $4,250 in cash and 136,340 shares of the Company's common stock at closing. Immediately after the acquisition, the Company contributed the acquired assets and committed to fund an initial $3,000 in cash to a joint venture formed between the Company and Darling Ingredients Inc. ("Darling") to generate high-nutrition, low environmental impact animal and fish feed, as well as fertilizer products. Both the Company and Darling have each agreed to contribute up to $5,000 in additional capital contributions to fund the operations of the joint venture. The EnviroFlight members may receive up to $5,500 in additional shares of the Company's common stock if the joint venture meets certain regulatory and commercial milestones prior to February 2019.

In February 2016, Intrexon and AquaBounty entered into a promissory note (the "note") whereby AquaBounty may draw up to $10,000. The note bears interest at 10% and matures in March 2017, and the outstanding principal and interest amounts may be converted to AquaBounty common stock at the election of Intrexon. AquaBounty borrowed $2,500 in February 2016.

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Exhibit index
Description of exhibit

1.1*	Controlled Equity Offering[SM] Sales Agreement between Intrexon and Cantor Fitzgerald & Co., dated November 11, 2015 (19)
2.1*	Amended and Restated Membership Interest Purchase Agreement, dated as of August 8, 2014, by and among Intrexon, Trans Ova Genetics, L.C., the Sellers named on the signature pages thereto, and Pro-Edge, LP., as the Securityholders Representative (11)
2.2*	Agreement for the Acquisition of the Entire Issued and To Be Issued Share Capital of Oxitec Limited, dated August 7, 2015, by and among Intrexon, the Sellers named therein, the Warrantors (as defined therein) and 3729th Single Member Shelf Trading Company Limited (17)
3.1*	Amended and Restated Articles of Incorporation (4)
3.2*	Bylaws (4)
4.1*	Specimen certificate evidencing shares of common stock (2)
4.2*	Warrants to purchase shares of common stock (2)
4.3*	Eighth Amended and Restated Investors' Rights Agreement, dated March 1, 2013, by and among Intrexon and the holders of the Company's preferred stock and certain holders of Intrexon's common stock and Joinder thereto (1)
10.1†*	Intrexon Corporation Amended and Restated 2008 Equity Incentive Plan and Form of Incentive Stock Option Agreement (2)
10.2†*	Intrexon Corporation Amended and Restated 2013 Omnibus Incentive Plan and Forms of Award Agreements (14)
10.2A†*	Amendment to the Intrexon Corporation Amended and Restated 2013 Omnibus Incentive Plan, effective as of June 11, 2015 (16)
10.2B†*	Intrexon Corporation 2013 Amended and Restated Omnibus Incentive Plan, as amended, Restricted Stock Unit Agreement, by and between Intrexon and Randal J. Kirk, effective as of November 1, 2015 (18)
10.3#*	Exclusive Channel Partner Agreement, dated as of January 6, 2011, between Intrexon and ZIOPHARM Oncology, Inc., as amended (1)
10.3A*	Second Amendment to Exclusive Channel Partner Agreement, dated March 27, 2015, between Intrexon and ZIOPHARM Oncology, Inc. (15)
10.4*	Stock Purchase Agreement, dated as of January 6, 2011, between Intrexon and ZIOPHARM Oncology, Inc. (1)
10.5#*	Exclusive Channel Collaboration Agreement, dated as of June 5, 2012, between Intrexon and Oragenics, Inc. (1)

10.6#*	Exclusive Channel Collaboration Agreement, dated as of August 6, 2012, between Intrexon and Synthetic Biologics, Inc. (1)
10.7#*	Exclusive Channel Collaboration Agreement, dated as of October 5, 2012, between Intrexon and Fibrocell Science, Inc. (1)
10.7*	First Amendment to Exclusive Channel Collaboration Agreement, dated as of June 28, 2013, between Intrexon and Fibrocell Science, Inc. (1)
10.8#*	Exclusive Channel Collaboration Agreement, dated as of February 14, 2013, between Intrexon and AquaBounty Technologies, Inc. (1)
10.9*	Relationship Agreement, dated as of December 5, 2012, between Intrexon and AquaBounty Technologies, Inc. (1)
10.10#*	Exclusive Channel Collaboration Agreement, dated as of March 29, 2013, between Intrexon and Genopaver, LLC (1)
10.11†*	Second Amended and Restated Employment Agreement, dated as of August 31, 2006, between Intrexon and Thomas D. Reed (2)
10.12#*	Exclusive Channel Collaboration Agreement, dated as of September 30, 2013, between Intrexon and S & I Ophthalmic, LLC (6)

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10.13#*	Limited Liability Company Agreement, dated as of September 30, 2013, among Intrexon, Caraco Pharmaceutical Laboratories Ltd. and S & I Ophthalmic, LLC (6)
10.14#*	Exclusive Channel Collaboration Agreement, dated as of March 26, 2014, by and between Intrexon Corporation and Intrexon Energy Partners, LLC (10)
10.15#*	Amended and Restated Limited Liability Company Agreement of Intrexon Energy Partners, LLC, dated as of March 26, 2014, by and among Intrexon and the parties thereto (10)
10.16*	Letter Agreement by and between ZIOPHARM Oncology, Inc., Intrexon and The University of Texas System Board of Regents on behalf of The University of Texas MD Anderson Cancer Center, dated as of January 9, 2015 (12)
10.17*	Securities Issuance Agreement by and among Intrexon, The University of Texas System Board of Regents on behalf of The University of Texas MD Anderson Cancer Center dated as of January 13, 2015 (12)
10.18*	Securities Issuance Agreement by and among Intrexon, The University of Texas System Board of Regents on behalf of The University of Texas MD Anderson Cancer Center dated as of January 13, 2015 (12)
10.19*	Registration Rights Agreement by and among Intrexon, The University of Texas System Board of Regents on behalf of The University of Texas MD Anderson Cancer Center dated as of January 13, 2015(12)
10.20#*	License Agreement by and among ZIOPHARM Oncology, Inc., Intrexon and The University of Texas System Board of Regents on behalf of The University of Texas MD Anderson Cancer Center, dated as of January 13, 2015 (13)
10.21#*	License and Collaboration Agreement, dated as of March 27, 2015, among Intrexon, ARES Trading S.A. and ZIOPHARM Oncology, Inc. (15)
10.22†*	Intrexon Corporation Annual Executive Incentive Plan, adopted as of April 29, 2015 (16)
10.23*	Services Agreement, by and between Intrexon Corporation and Third Security, LLC, effective as of November 1, 2015 (18)
21.1	List of Subsidiaries of Intrexon Corporation
23.1	Consent of PricewaterhouseCoopers LLP
31.1	Certification of Randal J. Kirk, Chairman and Chief Executive Officer (Principal Executive Officer) of Intrexon Corporation, pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as amended, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2	Certification of Rick L. Sterling, Chief Financial Officer (Principal Financial Officer) of Intrexon Corporation, pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as amended, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1**	Certification of Randal J. Kirk, Chairman and Chief Executive Officer (Principal Executive Officer) of Intrexon Corporation, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002

32.2**	Certification of Rick L. Sterling, Chief Financial Officer (Principal Financial Officer) of Intrexon Corporation, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101**	Interactive Data File (Intrexon Corporation and Subsidiaries Consolidated Financial Statements for the years ended December 31, 2015, 2014 and 2013, furnished in XBRL (eXtensible Business Reporting Language)).

Attached as Exhibit 101 are the following documents formatted in XBRL: (i) the Consolidated Balance Sheets at December 31, 2015 and 2014, (ii) the Consolidated Statements of Operations for the years ended December 31, 2015, 2014 and 2013, (iii) the Consolidated Statements of Shareholders' and Total Equity (Deficit) for the years ended December 31, 2015, 2014 and 2013, (iv) the Consolidated Statements of Cash Flows for the years ended December 31, 2015, 2014 and 2013 and (v) the Notes to Consolidated Financial Statements for the years ended December 31, 2015, 2014 and 2013. Users of this data are advised pursuant to Rule 406T of Regulation S-T that this interactive data file is deemed not filed or part of a registration statement or prospectus for purposes of sections 11 or 12 of the Securities Act of 1933, is deemed not filed for purposes of section 18 of the Securities and Exchange Act of 1934, and otherwise is not subject to liability under these sections. Users of this data are advised pursuant to Rule 406T of Regulation S-T that this interactive data file is deemed not filed or part of a registration statement or prospectus for purposes of sections 11 or 12 of the Securities Act of 1933, is deemed not filed for purposes of section 18 of the Securities and Exchange Act of 1934, and otherwise is not subject to liability under these sections.

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* Previously filed and incorporated by reference to the exhibit indicated in the following filings by Intrexon:
(1) Registration Statement on Form S-1, filed with the Securities and Exchange Commission on July 9, 2013.
(2) Amendment No. 1 to Registration Statement on Form S-1, filed with the Securities and Exchange Commission on July 29, 2013.
(3) Amendment No. 2 to Registration Statement on Form S-1, filed with the Securities and Exchange Commission on August 6, 2013.
(4) Current Report on Form 8-K, filed with the Securities and Exchange Commission on August 15, 2013.
(5) Current Report on Form 8-K, filed with the Securities and Exchange Commission on October 1, 2013.
(6) Current Report on Form 8-K/A, filed with the Securities and Exchange Commission on October 30, 2013.
(7) Current Report on Form 8-K, filed with the Securities and Exchange Commission on December 23, 2013.
(8) Current Report on Form 8-K, filed with the Securities and Exchange Commission on January 13, 2014.
(9) Current Report on Form 8-K, filed with the Securities and Exchange Commission on January 30, 2014.
(10) Current Report on Form 8-K/A, filed with the Securities and Exchange Commission on April 4, 2014.
(11) Current Report on Form 8-K, filed with the Securities and Exchange Commission on August 11, 2014.
(12) Current Report on Form 8-K, filed with the Securities and Exchange Commission on January 14, 2015.
(13) Current Report on Form 8-K/A, filed with the Securities and Exchange Commission on January 28, 2015.
(14) Current Report on Form 8-K, filed with the Securities and Exchange Commission on June 13, 2014.
(15) Current Report on Form 8-K, filed with the Securities and Exchange Commission on April 2, 2015.
(16) Current Report on Form 8-K, filed with the Securities and Exchange Commission on June 17, 2015.
(17) Current Report on Form 8-K, filed with the Securities and Exchange Commission on August 12, 2015.
(18) Current Report on Form 8-K/A, filed with the Securities and Exchange Commission on November 3, 2015.
(19) Current Report on Form 8-K, filed with the Securities and Exchange Commission on November 12, 2015.
** Furnished herewith
† Indicates management contract or compensatory plan.
# Portions of the exhibit (indicated by asterisks) have been omitted pursuant to a confidential treatment order granted by the Securities and Exchange Commission.