

The information in this preliminary prospectus supplement is not complete and may be changed. This preliminary prospectus supplement and the accompanying base prospectus are not an offer to sell these securities, and are not soliciting an offer to buy these securities, in any jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED JUNE 27, 2018

PRELIMINARY PROSPECTUS SUPPLEMENT
(To prospectus dated September 1, 2017)

\$100,000,000



INTREXON CORPORATION

Common Stock

We are offering \$100,000,000 of shares of common stock of Intrexon Corporation pursuant to this prospectus supplement, which we will lend to J.P. Morgan Securities LLC (which we refer to when acting in this capacity as the "share borrower"), the underwriter for this offering (which we refer to as "J.P. Morgan" when acting in its capacity as underwriter). The shares being lent by us to the share borrower are referred to herein as the "borrowed shares." See "Description of share lending agreement."

We will not receive any proceeds from the sale of the borrowed shares in this offering. The share borrower or its affiliates will receive all the proceeds from the sale of the borrowed shares.

The share borrower has informed us that it or one of its affiliates intends to use the short position created by the share loan and the short sales of the borrowed shares to facilitate transactions by which investors in our % convertible senior notes due 2023 (which we refer to as the "notes" and which are being offered in a concurrent offering pursuant to a separate prospectus supplement and accompanying prospectus) may hedge their respective investments through short sales of our common stock or privately negotiated derivative transactions.

The share borrower will offer and sell by this prospectus supplement and the accompanying prospectus the borrowed shares to the public at a price of \$ per share concurrently with the offering of the convertible notes.

Concurrently with this offering, we are offering up to \$200.0 million aggregate principal amount of the notes, assuming no exercise of the note underwriters' over-allotment option (or up to \$230.0 million aggregate principal amount of the notes if the note underwriters exercise their over-allotment option in full), pursuant to a separate prospectus supplement and accompanying prospectus. The offering of the borrowed shares pursuant to this prospectus supplement and the accompanying prospectus is contingent upon the closing of the notes offering, and the concurrent offering of the notes is contingent upon the closing of the offering of the borrowed shares hereunder. This prospectus supplement is not an offer to sell or the solicitation of an offer to buy any securities being offered in the concurrent offering of notes.

Our common stock trades on the New York Stock Exchange under the symbol "XON." On June 26, 2018, the last reported sale price of our common stock on the New York Stock Exchange was \$14.15 per share.

Randal J. Kirk, our Chairman, Chief Executive Officer and principal shareholder, has indicated that he or an entity with which he is affiliated may have interest in purchasing at the public offering price up to all of the shares of our common stock offered in this offering. The ultimate allocation of the borrowed shares will be determined by the underwriter, and Mr. Kirk or such entity may or may not purchase some or all of the borrowed shares.

Investing in our common stock involves risks. Before buying any shares, you should read the discussion of material risks of investing in our common stock in "[Risk factors](#)" beginning on page S-7 of this prospectus supplement, and in the risks discussed in the documents incorporated by reference in this prospectus supplement, as they may be amended, updated or modified periodically in our reports filed with the Securities and Exchange Commission.

	Per borrowed share	Total
Public offering price	\$	\$
Underwriting discounts and commissions	0	0
Proceeds to us before expenses	0	0

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

We expect that delivery of the borrowed shares being offered will be made on or about , 2018.

J.P. Morgan

The date of this prospectus supplement is June , 2018.

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About this prospectus supplement

This document is in two parts, both of which are part of a shelf registration statement on Form S-3 that we filed with the Securities and Exchange Commission, or the SEC, on September 1, 2017, pursuant to which we may from time to time offer various securities in one or more offerings. The first part of this document is this prospectus supplement, which describes the terms of this offering and also adds to and updates information contained in the accompanying prospectus and the documents incorporated by reference into this prospectus. The second part is the accompanying prospectus, which gives more general information about the shares of our common stock and other securities we may offer from time to time under our shelf registration statement, some of which may not apply to the shares of common stock offered by this prospectus. When we refer to this “prospectus,” we are generally referring to both parts of this document combined. To the extent there is a conflict between the information contained in this prospectus supplement, on the one hand, and the information contained in the accompanying prospectus or any document incorporated by reference into this prospectus, on the other hand, you should rely on the prospectus supplement unless the document incorporated by reference has a later date than this prospectus supplement, in which case you should rely on the document with a later date.

We have not, and the underwriter has not, authorized anyone to provide any information other than that contained or incorporated by reference in this prospectus supplement or in any free writing prospectus prepared by or on behalf of us. Neither we nor the underwriter takes any responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. We are not, and the underwriter is not, making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should not assume that the information contained in this prospectus supplement, the accompanying prospectus or the documents incorporated herein by reference is accurate as of any date other than their respective dates. Our business, financial condition, results of operations and prospects may have changed since those dates.

We are offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where such offers and sales are permitted.

When used in this prospectus, the terms “Intrexon,” “the Company,” “we,” “our” and “us” refer to Intrexon Corporation and its subsidiaries, unless otherwise specified or the context otherwise requires. Intrexon® is our registered trademark in the United States. This prospectus and the information incorporated herein by reference contain references to trademarks, service marks and trade names owned by us or other companies. Solely for convenience, trademarks, service marks and trade names referred to in this prospectus and the information incorporated herein, including logos, artwork, and other visual displays, may appear without the ® or ™ symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or the rights of the applicable licensor to these trademarks, service marks and trade names. We do not intend our use or display of other companies’ trade names, service marks or trademarks to imply a relationship with, or endorsement or sponsorship of us by, any other companies. Other trademarks, trade names and service marks appearing in this prospectus supplement and any accompanying prospectus or any related free writing prospectus are the property of their respective owners.

Prospectus supplement summary

The following summary highlights information contained or incorporated by reference in this prospectus supplement and the accompanying prospectus and is qualified in its entirety by the more detailed information and consolidated financial statements included elsewhere or incorporated by reference in this prospectus supplement. This summary does not contain all of the information that may be important to you. You should read and carefully consider the following summary together with the entire prospectus supplement and accompanying prospectus, including the documents incorporated by reference herein and therein, before deciding to invest in our common stock. Some of the statements included or incorporated by reference in this prospectus supplement or the accompanying prospectus constitute forward-looking statements that involve risks and uncertainties. See "Cautionary statement regarding forward-looking statements." Our actual results could differ materially from those anticipated in such forward-looking statements as a result of certain factors, including those discussed in the "Risk factors" and other sections of this prospectus supplement and the accompanying prospectus.

Overview

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, focusing on programming biological systems to alleviate disease, remediate environmental challenges, and provide sustainable food and industrial chemicals. Synthetic biology involves the tightly controlled expression of natural and engineered genes (DNA segments) in a variety of animal, plant and microorganismal hosts. Our historical approach primarily involved an exclusive channel collaboration, or ECC, model in which we served principally as the technology engine for a partner experienced in a given commercial arena. As our experience has deepened, we have moved toward more joint ventures, or JVs, and the self-development of projects we view as particularly compelling and within our increasing areas of expertise.

Synthetic biology is a 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 subsidiaries, JVs, and collaborators, we seek to create more effective, less costly and more sustainable solutions than can be provided through current industry practices. 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 biopharmaceuticals market is over \$175 billion. While genetically modified salmon or tilapia may be considered new products, the global market for aquaculture was estimated at more than \$170 billion in 2017. Genetically modified agricultural plants are already grown on approximately 180 million hectares around the world and are worth an estimated \$15 billion. In energy, we are working to create novel, highly engineered bacteria that utilize specific energy feedstocks, typically pipeline grade natural gas, to synthesize commercial end products, such as isobutanol for gasoline blending, 2,3 Butanediol for conversion to synthetic rubber and 1,4 Butanediol for polyester. Today these target markets are estimated to represent over \$100 billion in aggregate commercial opportunity.

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. To enable us to maximize the number of these markets we could address, we devised a strategy that allowed us to focus on our core expertise in synthetic biology while developing many different commercial product candidates via collaborations in a broad range of industries or end markets. Historically, we built our business primarily around the formation of ECCs. An ECC is an agreement with a collaborator to develop products based on technologies in a specifically defined field. We have sought collaborators with expertise within a specific industry sector and the commitment to provide resources for the commercialization of products within that industry sector. Through 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. In addition, we have sometimes executed a research collaboration to develop an early-stage program pursuant to which we received reimbursement for our development costs but the exclusive commercial rights, and related access fees, were deferred until completion of an initial research program.

This ECC strategy has allowed us to leverage our capabilities and capital across numerous product development programs and a broader landscape of end markets than we would have been capable of addressing on our own. The strategy has also allowed 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. We presently are party to a number of these collaborations, which are in varying stages from research and development of product candidates to monitoring the progress of our collaborator in their further development and the potential commercialization of product candidates enabled through our collaborations.

Over time, our strategy has evolved away from ECC-type collaborations to relationships and structures that provide us with more control and ownership over the development process and commercialization path. In these new relationships and structures, we bear more of the responsibility to fund the projects and execute on product candidate development.

First, in certain strategic circumstances, we may enter into a JV with a third-party collaborator whereby we may contribute access to our technology, cash or both into the JV which we will jointly control with our collaborator.

Pursuant to a JV agreement, we may be required to contribute additional capital to the JV, 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. Second, we are increasing the resources we are expending internally on early-stage proof of concept programs where we believe we can leverage our competitive edge in gene program creation and host cell and genome expertise. We are also seeking to partner more mature programs and capabilities or later-stage assets. In this way, we endeavor to leverage our capital resources and ultimately hope to realize significant value from our mature assets.

As we consider the broad potential applications of our synthetic biology technologies, and consistent with the evolution of our business strategy, we have acquired a number of ventures that are already enabling products that benefit from the application of synthetic biology. Our strategy contemplates the continued acquisition of product-focused companies that we believe may leverage our technologies and expertise in order to expand their respective product applications. We believe that the acquisition of these types of companies allows us to develop and commercialize innovative products and create significant value.

Consistent with the ongoing evolution of our strategy, from principally utilizing ECCs to seeking a more diverse approach to leverage our technology assets, we routinely consider ways to organize our business and the grouping of our assets to facilitate strategic opportunities.

Corporate information

We were founded by Thomas D. Reed, Ph.D., in 1998, as an Ohio limited liability company under the name Genomatix LTD. We were reincorporated as a Virginia corporation in 2004 and changed our name to Intrexon Corporation in 2005. The principal executive offices of Intrexon are located at 20374 Seneca Meadows Parkway, Germantown, Maryland 20876, and our telephone number is (301) 556-9900. Our website is www.dna.com. The information on, or that can be accessed through, our website does not constitute part of this prospectus supplement, and you should not rely on any such information in making the decision whether to purchase our common stock. Our common stock is traded on the NYSE under the symbol "XON."

The offering

Issuer	Intrexon Corporation
Common stock to be outstanding immediately after this offering	shares, including the borrowed shares, which will be outstanding for state corporate law purposes, but assuming the borrowed shares will be classified as equity under U.S. GAAP, will not be outstanding under U.S. GAAP currently in effect.
Offering of borrowed shares	We will lend \$100,000,000 of shares of our common stock to J.P. Morgan Securities LLC (which we refer to when acting in this capacity as the “share borrower”), the underwriter for this offering (which we refer to as “J.P. Morgan” when acting in its capacity as underwriter), pursuant to a share lending agreement (which we refer to as the “share lending agreement”). We have been informed by the share borrower that it or one of its affiliates intends to use the short position created by the share loan and the short sales of the borrowed shares to facilitate transactions by which investors in our % convertible senior notes due 2023 (which we refer to as the “notes” and which are being offered in a concurrent offering pursuant to a separate prospectus supplement and accompanying prospectus) may hedge their investments through short sales of our common stock or private negotiated derivative transactions. See “Description of share lending agreement.”
Use of proceeds	We will not receive any proceeds from the sale of the borrowed shares offered hereunder. The share borrower or its affiliates will receive all the proceeds from the sale of the borrowed shares. See “Use of proceeds.”
Concurrent offering of notes	Concurrently with this offering, we are offering up to \$200.0 million aggregate principal amount of the notes, assuming no exercise of the note underwriters’ over-allotment option (or up to \$230.0 million aggregate principal amount of the notes if the note underwriters exercise their over-allotment option in full), pursuant to a separate prospectus supplement and accompanying prospectus. The offering of the borrowed shares pursuant to this prospectus supplement and the accompanying prospectus is contingent upon the closing of the notes offering, and the concurrent offering of the notes is contingent upon the closing of the offering of the borrowed shares hereunder. See “Concurrent offering of convertible senior notes.”
Insider participation	Randal J. Kirk, our Chairman, Chief Executive Officer and principal shareholder, has indicated that he or an entity with which he is affiliated may have interest in purchasing at the public offering price up to all of the shares of our common stock offered in this offering. The ultimate allocation of the borrowed shares will be determined by the underwriter, and Mr. Kirk or such entity may or may not purchase some or all of the borrowed shares.

Risk factors

In analyzing an investment in the shares of common stock being offered pursuant to this prospectus supplement, you should carefully consider, along with other matters included or incorporated by reference in this prospectus supplement or the accompanying prospectus, the information set forth under "Risk factors" in this prospectus supplement and the risks discussed in the documents incorporated by reference in this prospectus supplement, as they may be amended, updated or modified periodically in our reports filed with the SEC.

Conflicts of interest

All of the proceeds from the sale of the borrowed shares in this offering will be paid to J.P. Morgan, the underwriter for this offering, or an affiliate thereof. As a result, J.P. Morgan, or an affiliate thereof, will receive more than 5% of the net proceeds of this offering. Thus, J.P. Morgan has a "conflict of interest" as defined in Rule 5121 (Public Offerings of Securities with Conflicts of Interest) of the Financial Industry Regulatory Authority, Inc. Accordingly, this offering is being made in compliance with the requirements of Rule 5121. In accordance with Rule 5121, any underwriter that has a conflict of interest pursuant to Rule 5121 will not make sales to discretionary accounts without the prior written consent of the customer. The appointment of a "qualified independent underwriter" is not required in connection with this offering as a "bona fide public market," as defined in Rule 5121, exists for our common stock.

New York Stock Exchange symbol

XON

The number of shares of our common stock to be outstanding after this offering is based on 129,239,376 shares of common stock outstanding on March 31, 2018 and excludes:

- 11,546,434 shares of our common stock issuable upon the exercise of outstanding options at a weighted average exercise price of \$28.31 per share, of which 6,533,996 options are vested as of March 31, 2018;
- 1,052,182 shares of our common stock issuable upon vesting of restricted stock units outstanding as of March 31, 2018;
- 133,264 shares of our common stock issuable upon the exercise of warrants outstanding as of March 31, 2018 at a weighted average exercise price of \$28.85 per share;
- 3,279,291 shares of our common stock available for future issuance under our 2013 Omnibus Incentive Plan as of March 31, 2018 (and an additional 2,000,000 shares of our common stock available for future issuance under our 2013 Omnibus Incentive Plan as of June 7, 2018);
- \$800,000 per month in shares of our common stock issuable to Third Security, LLC, following March 31, 2018, in connection with the services agreement we entered into with it in November 2015, as amended;
- \$200,000 per month in shares of our common stock issuable to Randal J. Kirk, our Chairman and Chief Executive Officer, following March 31, 2018, in connection with the compensation arrangement we entered into with him in November 2015, as amended;

- shares of our common stock potentially issuable upon conversion of the convertible notes we are offering in our concurrent offering of notes; and
- the issuance of up to \$4,000,000 of shares of our common stock to the former members of EnviroFlight, LLC in connection with a joint venture formed with EnviroFlight, LLC in February 2016, if certain commercial milestones are met prior to February 2019.

Risk factors

An investment in our shares of common stock involves a high degree of risk. Prior to making a decision about investing in our shares of common stock, you should carefully consider the risks, uncertainties and assumptions discussed under Item 1A, "Risk Factors," in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017, under Item 1A, "Risk Factors," in our Quarterly Report on Form 10-Q for the three months ended March 31, 2018 and any subsequently filed SEC reports, all of which are incorporated herein by reference and the other information set forth or incorporated by reference in this prospectus supplement and the accompanying prospectus. See the sections of this prospectus supplement entitled "Where you can find more information" and "Incorporation of certain information by reference." Additional risks and uncertainties not presently known to us, or that we currently see as immaterial, may also harm our business. If any of these risks occur, our business, financial condition and operating results could be harmed, the trading price of our common stock could decline and you could lose part or all of your investment.

This prospectus supplement 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 prospectus supplement and the documents incorporated by reference herein. See "Cautionary statement regarding forward-looking statements" for information relating to these forward-looking statements.

Risks related to this offering

The effect of the issuance and sale of the borrowed shares, which issuance is being made to facilitate transactions by which investors in our concurrently offered notes may hedge their investments, may be to lower the market price of our common stock.

Pursuant to this offering, we are offering \$100,000,000 of shares of our common stock, which will be loaned by us to J.P. Morgan Securities LLC (which we refer to when acting in this capacity as the "share borrower"), the underwriter for this offering (which we refer to as "J.P. Morgan" when acting in its capacity as underwriter), pursuant to a share lending agreement. The share borrower or its affiliates will receive all of the proceeds of this offering and we will not receive any proceeds of this offering. This offering of the borrowed shares is contingent upon the closing of the concurrent offering of our % convertible senior notes due 2023 (the "notes"), and the concurrent offering of the notes is contingent upon the closing of this offering of the borrowed shares. See "Description of share lending agreement."

We have been informed by the share borrower that it or one of its affiliates intends to use the short position created by the share loan and the concurrent short sales of the borrowed shares to facilitate transactions by which investors in the notes may hedge their investments through short sales or privately negotiated derivatives transactions. The existence of the share lending agreement in connection with the offering of the borrowed shares, the short sales of our common stock effected in connection with the sale of the notes and the related derivatives transactions, or any unwind of such short sales or derivatives transactions, could cause the market price of our common stock to be lower over the term of the share lending agreement than it would have been had we not entered into that agreement, due to the effect of the increase in the number of outstanding shares of our common stock or otherwise. For example, in connection with any cash settlement of any such derivative transaction, the share borrower or its affiliates may purchase shares of our common stock and the note investors may sell shares of our common stock, which could temporarily increase, temporarily delay a decline in, or temporarily decrease, the market price of our common stock. The market price of our common stock could be further negatively affected by these or other short sales of our common stock, including other sales by the purchasers of the notes hedging their investment therein.

Adjustments by purchasers of the notes of their hedging positions in our common stock and the expectation thereof may have a negative effect on the market price of our common stock.

The borrowed shares offered in this offering are expected to be used by investors in the notes to establish hedged positions with respect to our common stock through short sale transactions or privately negotiated derivative transactions. The number of borrowed shares offered in this offering may be more or less than the number of shares that will be needed in such hedging transactions. Any buying or selling of shares of our common stock by those investors to adjust their hedging positions in connection with this offering or the concurrent offering or in the future may affect the market price of our common stock.

In addition, the existence of the notes may also encourage short selling by market participants because the conversion of the notes could depress our common stock price. The price of our common stock could be affected by possible sales of our common stock by investors who view the notes as a more attractive means of equity participation in us and by hedging or arbitrage trading activity which we expect to occur involving our common stock. This hedging or arbitrage trading activity could, in turn, affect the market price of the notes.

Changes in the accounting guidelines relating to the borrowed shares or our inability to classify the borrowed shares as equity could decrease our reported earnings per share and potentially our common stock price.

Because the borrowed shares that are being offered in this offering (or identical shares) must be returned to us when the share lending agreement terminates pursuant to its terms (or earlier in certain circumstances), we believe that under U.S. GAAP, as presently in effect, assuming the borrowed shares issued pursuant to the share lending agreement are classified as equity under U.S. GAAP, the borrowed shares will not be considered outstanding for the purpose of computing and reporting our earnings per share. If accounting guidelines were to change in the future or we are unable to classify the borrowed shares issued pursuant to the share lending agreement as equity, we may be required to treat the borrowed shares as outstanding for purposes of computing earnings per share, our reported earnings per share would be reduced and our common stock price could decrease, possibly significantly.

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

We will need substantial additional capital in the future in order to fund our business and continue as a going concern.

We expect our future capital requirements will be substantial, as we continue to develop our business and expand our synthetic biology technology platform and for capital investment needed to scale up our commercial operations. Our need for additional capital will depend on many factors, including:

- the commercial success of products being developed by our subsidiaries, JVs and unpartnered programs;
- the commercial success of our operating subsidiaries, ECCs and JVs;
- whether we are successful in obtaining payments in connection with strategic transactions;
- whether we are successful in obtaining payments from our collaborators and licensees;
- whether we can enter into additional collaborations or JVs;
- the progress and scope of the collaborative and independent research and development projects performed by us and our collaborators;
- the timing and capital requirements to scale up our various products and services offerings;
- 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;

- the filing, prosecution and enforcement of our intellectual property;
- investments we may make in current and future collaborators, including JVs;
- our ability to maintain or improve the volume and pricing of our current product offerings and to develop new offerings, including those which may incorporate new technologies; 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 activities.

In October 2017, we entered into a Preferred Stock Equity Facility Agreement with Kapital Joe, LLC, or Kapital Joe, an entity affiliated with Randal J. Kirk, our Chairman and Chief Executive Officer, pursuant to which we may, at our sole and exclusive option, issue and sell to Kapital Joe, up to \$100 million of our Series A Redeemable Preferred Stock, or Series A Preferred Stock. We are currently party to 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. The Company intends to terminate the Preferred Stock Facility upon closing of this offering.

We have evaluated our ability to continue as a going concern within one year after the date of this prospectus supplement. As of March 31, 2018, we had an accumulated deficit of \$930.2 million. During the quarter ended March 31, 2018, we incurred a net loss of \$43.2 million and used \$29.9 million of cash in operating activities. Due to our recurring losses from operations and the expectation that we will continue to incur losses in the foreseeable future, we will need to raise additional capital to complete the development and commercialization of our current product candidates. As of May 31, 2018, our cash and cash equivalents balance was approximately \$90.5 million and our available equity and credit facilities totaled approximately \$105.3 million, including the \$100 million available from our Preferred Stock Equity Facility Agreement with Kapital Joe discussed above. If we are unable to consummate our concurrent offering of notes on anticipated terms, based on these available balances and facilities and our current projected cash flows for the foreseeable future, we will need to seek additional funding through public or private equity or debt financings, through existing or new collaboration agreements, and/or through divestitures of our assets and may need to implement certain plans to reduce development efforts or other expenditures in order to continue operations beyond 12 months from the date of the prospectus supplement. Our ability to obtain additional equity or debt financing or collaborations is subject to a number of factors, many of which are beyond our control, including market conditions, our operating performance and investor sentiment. We may not be able to obtain financing on acceptable terms, or at all, and we may not be able to enter into additional collaboration arrangements or divest our assets. If necessary, we believe we could reduce activities and expenditures with certain of our general and administrative contractors, reduce or eliminate certain internal research and development programs, and divest in certain of our assets in order to continue operations beyond twelve months from the date of this prospectus supplement; there is no guarantee that we could carry out all of these actions or that they would be sufficient for the Company to continue as a going concern.

Risks related to our common stock

The continued evolution of our business strategy and the restructuring of our business and assets may not be a successful strategy and may increase our capital requirements, increase our costs or otherwise harm our operating results and financial condition.

Our business strategy has evolved, and continues to evolve, toward relationships and structures that provide us with more control and ownership over the development process and commercialization path. This new strategy or approach entails risks in implementation and operations and there is no guarantee that it will be successful. Furthermore, the changing focus of our business strategy may require additional capital beyond what we have

historically used and what is available and we may incur costs associated with the implementation and execution of our evolving business strategy. In addition, as we perform our annual impairment tests, we will evaluate the impact of changes in our business strategy and, as a result, may incur impairment charges and write-offs and other related expenses, any of which, if material, could harm our operating results and financial condition.

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, 2016 through June 26, 2018, our common stock has traded as high as \$40.24 per share and as low as \$10.26 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, our subsidiaries or JVs;
- financial results of our company, our subsidiaries or JVs;
- termination or delay of a development program;
- the recruitment or departure of key personnel; and
- the other factors described in the “Risk Factors” sections of our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 and any subsequent updates described in our Quarterly Reports on Form 10-Q and Current Reports on Form 8-K.

Randal J. Kirk controls approximately 46 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 Chairman and Chief Executive Officer, and affiliates of Mr. Kirk, including Third Security. As of March 31, 2018, Mr. Kirk and shareholders affiliated with him beneficially owned approximately 46 percent of our voting stock. Mr. Kirk has indicated that he or an entity with which he is affiliated may have interest in purchasing at the public offering price up to all of the borrowed shares offered in this offering. If Mr. Kirk purchases all of the borrowed shares offered in this offering at an assumed offering price of \$14.15, which was the last reported sale price of our common stock on the New York Stock Exchange on June 26, 2018, Mr. Kirk will beneficially own approximately 49% percent of our voting stock. In addition, pursuant to a Preferred Stock Equity Facility, or Preferred Stock Facility, we may, from time to time at our sole and exclusive option, issue and sell to an affiliate of Mr. Kirk up to 1,000,000 shares of our Series A Preferred Stock, which will be convertible into shares of our common stock upon the approval of our shareholders, subject to regulatory approval, at a conversion rate based on future market prices. The Company intends to terminate the Preferred Stock Facility upon the closing of this offering. 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.

After December 31, 2020, the holder of the Series A Preferred Stock, if and when issued, may require us to redeem any or all of the outstanding Series A Preferred Stock.

If we are unable to obtain the approval of our shareholders to convert any outstanding shares of Series A Preferred Stock prior to December 31, 2020, the holder of the Series A Preferred Stock may require us to redeem any or all of the outstanding shares of Series A Preferred Stock at the issue price of \$100 per share plus any accumulated but unpaid dividends thereon to, but not including, the redemption date, subject to adjustments. Any such redemption of our Series A Preferred Stock in cash would reduce the cash that we have available to invest in our business. In the event that we have issued Series A Preferred Stock and redemption is required, there can be no assurance that we will have enough cash at such time to redeem the outstanding shares. No shares of Series A Preferred Stock are currently outstanding, and the Company intends to terminate the Preferred Stock Facility upon the closing of this offering.

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.

In addition, as of March 31, 2018, there were 11,546,434 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. As of March 31, 2018, there were 1,052,182 restricted stock units, or RSUs, outstanding. Shares issuable upon the exercise of such options and upon vesting of the RSUs can be freely sold in the public market upon issuance and once vested. Additionally, as of March 31, 2018, we had 3,279,291 shares available for grant under the 2013 Omnibus Incentive Plan, or the 2013 Plan. In June 2018, Intrexon's shareholders approved an additional 2,000,000 shares of common stock to be reserved for issuance under the 2013 Plan.

Cautionary statement regarding forward-looking statements

This prospectus supplement, the accompanying prospectus and the information incorporated herein by reference contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Any applicable free writing prospectus may also contain these types of forward-looking statements. All statements, other than statements of historical facts, included or incorporated by reference in this prospectus supplement and the accompanying prospectus, and in any free writing prospectus, regarding our strategies, prospects, financial condition, costs, plans and objectives are forward-looking statements. These forward-looking statements reflect our beliefs and expectations as to future events and trends affecting our business, our consolidated financial condition and results of operations. These forward-looking statements are based upon our current expectations concerning future events and discuss, among other things, anticipated future financial performance and future business plans. Forward-looking statements are necessarily subject to risks and uncertainties, many of which are outside our control, that could cause actual results to differ materially from these statements. Forward-looking statements can be identified by such words as “anticipates,” “believes,” “plan,” “assumes,” “could,” “should,” “estimates,” “expects,” “intends,” “potential,” “seek,” “predict,” “may,” “will” and similar expressions. These forward-looking statements include, among other things, statements about:

- our strategy and overall approach to our business model;
- our ability to successfully enter new markets or develop additional products, whether with our collaborators or independently;
- our ability to successfully enter into optimal strategic relationships with our subsidiaries and operating companies that we may form in the future;
- competition from existing technologies and products or new technologies and products that may emerge;
- actual or anticipated variations in our operating results;
- our current and future joint ventures, or JVs, exclusive channel collaborations, or ECCs, license agreements and other collaborations;
- developments concerning our collaborators and licensees;
- actual or anticipated fluctuations in our competitors’ or our collaborators’ and licensees’ operating results or changes in their respective growth rates;
- our cash position;
- our concurrent offering of notes;
- market conditions in our industry;
- our ability to protect our intellectual property and other proprietary rights and technologies;
- our ability to adapt to changes in laws or regulations and policies;
- the ability of our collaborators and licensees to adapt to changes in laws or regulations and policies and to secure any necessary regulatory approvals to commercialize any products developed under the ECCs, license agreements and JVs;
- the ability of our collaborators and licensees to protect our intellectual property and other proprietary rights and technologies;

- 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 our subsidiaries, a collaborator under an ECC, or through a JV or license under a license agreement;
- our ability to retain and recruit key personnel;
- the result of litigation proceedings that we face currently or may face in the future;
- our expectations related to the use of proceeds from our public offerings and other financing efforts;
- our estimates regarding expenses, future revenue, capital requirements and needs for additional financing; and
- the impact of the Tax Cuts and Jobs Act of 2017, or the Tax Act, on our current and future operating results.

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. Item 1A, "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2017, and Item 1A, "Risk Factors" in our Quarterly Reports on Form 10-Q for the three months ended March 31, 2018, which are incorporated by reference into this prospectus supplement, include 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. 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 prospectus supplement, the accompanying prospectus and the documents that we incorporate by reference.

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

Use of proceeds

We will not receive any proceeds from the sale of the borrowed shares offered hereunder. The share borrower or its affiliates will receive all the proceeds from the sale of the borrowed shares. See “Concurrent offering of convertible senior notes” and “Description of share lending agreement.”

The offering of borrowed shares pursuant to this prospectus supplement and the accompanying prospectus is being conducted in connection with the offering of the notes. The offering of borrowed shares pursuant to this prospectus supplement and the accompanying prospectus is contingent upon the closing of the concurrent notes offering, and the concurrent offering of the notes is contingent upon the closing of the offering of borrowed shares hereunder.

We estimate that the net proceeds we will receive from the concurrent offering of notes will be approximately \$193.9 million, after deducting underwriting discounts and commissions and estimated offering expenses payable by us in connection with this offering and the concurrent offering of notes. If the note underwriters exercise their option to purchase additional notes solely to cover over-allotments, if any, in full, we estimate that the net proceeds from the concurrent offering of notes will be approximately \$223.1 million, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us in connection with this offering and the concurrent offering of notes. We intend to use the net proceeds from the concurrent offering of notes for general corporate purposes and for strategic acquisitions or investments. General corporate purposes may include additions to working capital, financing internal research and development programs, financing of capital expenditures, repayment or redemption of existing indebtedness or payments to satisfy commitments under our ECCs, joint ventures and other collaborations. In addition, we intend to use the net proceeds of the concurrent offering of notes for future strategic acquisitions and strategic investment opportunities, but we have not determined the amount of net proceeds to be used specifically for such purposes, or any particular acquisitions or investments. As a result, management will retain broad discretion over the allocation of net proceeds of the concurrent offering of notes. Pending the application of net proceeds, we expect to invest the net proceeds in investment grade, interest-bearing securities.

Capitalization

The following table sets forth our cash, cash equivalents and short-term investments and our capitalization as of March 31, 2018:

- on an actual basis; and
- on an as adjusted basis to give effect to the sale of the notes in our concurrent offering of notes (assuming the note underwriters' option to purchase additional notes is not exercised), the sale of borrowed shares in this offering and the receipt of \$193.9 million of net proceeds from the note offering, after deducting the note underwriters' discounts and commissions and our estimated offering expenses related to this offering and our concurrent offering of notes, assuming the net proceeds are held as cash or cash equivalents and the borrowed shares issued pursuant to the share lending agreement are classified as equity.

This table assumes no exercise of the note underwriters' option to purchase additional notes in the concurrent notes offering. You should read this table together with our consolidated financial statements, related notes and other information included or incorporated by reference in this prospectus supplement.

	As of March 31, 2018	
	Actual	As Adjusted (unaudited)
	(in thousands, except share data)	
Cash, cash equivalents and short-term investments	\$ 120,205	\$ 314,080
Long-term debt:		
% convertible senior notes due 2023(1)	—	200,000
Other long-term debt	7,926	7,926
Lines of credit	321	321
Total debt	8,247	208,247
Shareholders' equity:		
Preferred stock, no par value; 25,000,000 shares authorized, no shares issued and outstanding, actual and as adjusted	—	—
Common stock, no par value; 200,000,000 shares authorized, 129,239,376 shares issued and outstanding, actual and as adjusted(2)	\$ —	\$ —
Additional paid-in capital(3)	1,492,916	1,492,916
Accumulated deficit	(930,220)	(930,220)
Accumulated other comprehensive loss	(9,587)	(9,587)
Total Intrexon shareholders' equity(3)	553,109	553,109
Total capitalization(3)	\$ 561,356	\$ 761,356

- (1) In accordance with Financial Accounting Standards Board Accounting Standards Codification 470-20, *Debt with Conversion and Other Options* ("ASC 470-20"), convertible debt that may be entirely or partially settled in cash (such as the notes) is required to be separated into a liability and an equity component, such that interest expense reflects the issuer's non-convertible debt interest cost. On the issuance date, the value of the conversion option of the notes, representing the equity component, will be recorded as additional paid-in capital within shareholders' equity and as a discount to the notes, which reduces their initial carrying value. The carrying value of the notes, net of the discount recorded, will be accreted up to the principal amount of the notes from the issuance date until maturity. ASC 470-20 does not affect the actual amount that we are required to repay. The amount shown in the table above for the notes is the aggregate principal amount of the notes, without reflecting the debt discount for the value of the conversion option as well as the underwriters' discounts and commissions and our estimated offering expenses related to this offering and the concurrent notes offering.

- (2) The number of shares issued and outstanding in the actual and as adjusted columns in the table above excludes:
- 11,546,434 shares of our common stock issuable upon the exercise of outstanding options at a weighted average exercise price of \$28.31 per share, of which 6,533,996 options are vested as of March 31, 2018;
 - 1,052,182 shares of our common stock issuable upon vesting of restricted stock units outstanding as of March 31, 2018;
 - 133,264 shares of our common stock issuable upon the exercise of warrants outstanding as of March 31, 2018 at a weighted average exercise price of \$28.85 per share;
 - 3,279,291 shares of our common stock available for future issuance under our 2013 Omnibus Incentive Plan as of March 31, 2018 (and an additional 2,000,000 shares of our common stock available for future issuance under our 2013 Omnibus Incentive Plan as of June 7, 2018);
 - \$800,000 per month in shares of our common stock issuable to Third Security, LLC, following March 31, 2018, in connection with the services agreement we entered into with it in November 2015, as amended;
 - \$200,000 per month in shares of our common stock issuable to Randal J. Kirk, our Chairman and Chief Executive Officer, following March 31, 2018, in connection with the compensation arrangement we entered into with him in November 2015, as amended;
 - the shares of our common stock to be issued in this offering, which will be outstanding for state corporate law purposes, but assuming the borrowed shares will be classified as equity under U.S. GAAP, will not be outstanding under U.S. GAAP currently in effect;
 - the issuance of up to \$4,000,000 of shares of our common stock to the former members of EnviroFlight, LLC in connection with a joint venture formed with EnviroFlight, LLC in February 2016, if certain commercial milestones are met prior to February 2019; and
 - the shares of our common stock reserved for issuance upon conversion of the notes being offered by us in our concurrent offering of notes.
- (3) The issuance of the notes (after giving effect to the application of ASC 470-20 as described in note (1) above) in our concurrent offering of notes will result in an increase to additional paid-in capital and, therefore, an increase in total Intrexon shareholders' equity and total capitalization. However, amounts shown in the table above do not reflect the application of ASC 470-20 to the notes nor the underwriters' discounts and commissions and our estimated offering expenses related to this offering and our concurrent notes offering.

Price range of common stock and dividend policy

Our common stock is listed and traded on the NYSE under the symbol "XON." The following table sets forth, for the periods indicated, the high and low sale prices per share of our common stock.

	<u>High</u>	<u>Low</u>
Year Ended December 31, 2018		
Second Quarter (through June 26, 2018)	\$19.87	\$14.15
First Quarter	\$17.10	\$12.01
Year Ended December 31, 2017		
Fourth Quarter	\$20.49	\$10.26
Third Quarter	\$25.30	\$17.04
Second Quarter	\$26.99	\$18.41
First Quarter	\$26.95	\$18.55
Year Ended December 31, 2016		
Fourth Quarter	\$32.90	\$24.01
Third Quarter	\$30.56	\$22.88
Second Quarter	\$38.60	\$22.81
First Quarter	\$40.24	\$18.52

Dividend policy

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.

Concurrent offering of convertible senior notes

Concurrently with this offering, we are offering, by means of a separate prospectus supplement and accompanying prospectus, \$200.0 million aggregate principal amount of our % convertible senior notes due 2023 (the “notes”). The underwriters of the concurrent offering of the notes have a 30-day option to purchase up to an additional \$30.0 million aggregate principal amount of notes, solely to cover over-allotments, if any.

Subject to satisfaction of certain conditions and during certain periods, the notes may be converted at an initial conversion rate of shares of common stock per \$1,000 principal amount of notes (equivalent to an initial conversion price of approximately \$ per share of common stock). The conversion rate is subject to adjustment if certain events occur.

We will settle conversions of the notes by paying or delivering, as the case may be, cash, shares of our common stock or a combination of cash and shares of our common stock, at our election.

We intend to use the net proceeds from the offering of notes for general corporate purposes and for strategic acquisitions or investments. General corporate purposes may include additions to working capital, financing of capital expenditures, repayment or redemption of existing indebtedness or payments to satisfy commitments under our ECCs and joint ventures. In addition, we intend to use the net proceeds from the offering of notes for future strategic acquisitions and strategic investment opportunities, but we have not determined the amount of net proceeds to be used specifically for such purposes, or any particular acquisitions or investments.

The concurrent offering of the notes is contingent upon the closing of this offering of the borrowed shares, and this offering of the borrowed shares is contingent upon the closing of the concurrent offering of the notes.

Description of share lending agreement

To make the purchase of the notes more attractive to prospective investors, we expect to enter into a share lending agreement concurrently with the pricing of the notes with J.P. Morgan Securities LLC (which we refer to when acting in this capacity as the “share borrower”), the underwriter for this offering (which we refer to as “J.P. Morgan” when acting in its capacity as underwriter), under which we will loan to the share borrower \$100,000,000 of borrowed shares on the closing date for the initial issuance of the notes.

The share loan under the share lending agreement will terminate, and the borrowed shares must be returned to us within five business days of such termination (subject to the share borrower’s right to extend the settlement due date of the borrowed shares in certain circumstances), under the following circumstances:

- the share borrower may terminate all or any portion of the loan at any time; and
- on the earliest to occur of (i) October 1, 2023 and (ii) the date, if any, on which the share lending agreement is terminated by the parties upon mutual agreement or by one party upon a default with respect to the other party.

All shares that we loan to the share borrower will be issued and outstanding for corporate law purposes and, accordingly, the holders of the borrowed shares will have all of the rights of a holder of our outstanding shares, including the right to vote the shares on all matters submitted to a vote of our shareholders and the right to receive any dividends or other distributions that we may pay or make on our outstanding shares of common stock. However, under the share lending agreement, the share borrower will agree:

- to pay to us an amount equal to cash dividends, if any, that we pay on the borrowed shares; and
- in the event of any other distribution on the borrowed shares, other than in a liquidation or a reorganization in bankruptcy and other than shares of our common stock, to either (i) deliver such distribution to us in kind or (ii) elect that the number of loaned shares outstanding under the share lending agreement shall be deemed adjusted in the same manner as the conversion rate of the notes.

In view of the contractual undertakings of the share borrower in the share lending agreement, which have the effect of substantially eliminating the economic dilution that otherwise would result from the issuance of the borrowed shares, we believe that assuming the borrowed shares issued pursuant to the share lending agreement are classified as equity under U.S. GAAP currently in effect, the borrowed shares will not be considered outstanding for the purpose of computing and reporting our earnings per share.

Under the share lending agreement, the share borrower has agreed to post and maintain with JPMorgan Chase Bank, National Association, New York Branch, acting as collateral agent on our behalf, collateral in the form of cash or certain eligible non-cash collateral with a market value at least equal to the market value of the borrowed shares as security for the obligation of the share borrower to return the borrowed shares to us when required under the terms of the share lending agreement. In certain limited circumstances, primarily if the share borrower defaults under the share loan agreement and is prohibited by law or court order from returning the borrowed shares, we may elect to receive a distribution of the posted collateral in lieu of the delivery of the shares. If we default under the share lending agreement, the share borrower may elect to deliver the posted collateral to us in lieu of the delivery of the shares.

The share borrower has informed us that it or one of its affiliates intends to use the short position created by the share loan and the short sales of the borrowed shares to facilitate transactions by which investors in the notes may hedge their respective investments through short sales or privately negotiated derivative transactions.

The existence of the share lending agreement and the short sales of our common stock effected in connection with the sale of the notes could cause the market price of our common stock to be lower over the term of the share lending agreement than it would have been had we not entered into that agreement. See “Risk factors—Risks related to this offering—The effect of the issuance and sale of the borrowed shares, which issuance is being made to facilitate transactions by which investors in our concurrently offered notes may hedge their investments, may be to lower the market price of our common stock.” However, we have determined that the entry into the share lending agreement is in our best interests as a means to facilitate the offer and sale of the notes on terms more favorable to us than we could have otherwise obtained.

Randal J. Kirk, our Chairman, Chief Executive Officer and principal shareholder, has indicated that he or an entity with which he is affiliated may have interest in purchasing at the public offering price up to all of the borrowed shares offered in this offering. The ultimate allocation of the borrowed shares will be determined by the underwriter, and Mr. Kirk or such entity may or may not purchase some or all of the borrowed shares.

Description of capital stock

The following description summarizes information about our capital stock. This information does not purport to be complete and is subject to, and qualified in its entirety by reference to, the terms of our amended and restated articles of incorporation and amended and restated bylaws, which are included as exhibits to the registration statement of which this prospectus supplement forms a part, and the applicable provisions of Virginia law, the state in which we are incorporated.

As of March 31, 2018, our authorized capital stock consisted of 200,000,000 shares of common stock, no par value per share, and 25,000,000 shares of preferred stock, no par value per share.

As of March 31, 2018, there were 129,239,376 shares of common stock outstanding and held of record by approximately 281 shareholders. 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. All outstanding shares of common stock are fully paid and nonassessable. There are no shares of preferred stock outstanding.

Common stock

Shares of our common stock have the following rights, preferences and privileges:

Voting rights

Each outstanding share of common stock is entitled to one vote on all matters submitted to a vote of our shareholders, including the election of directors. Holders of our common stock do not have cumulative voting rights in the election of directors, and therefore the holders of a plurality of the shares of common stock voting for the election of directors may elect all of our directors standing for election.

Dividends

Holders of common stock are entitled to receive dividends if and when dividends are declared by our board of directors out of assets legally available for the payment of dividends, subject to preferential rights of outstanding shares of preferred stock, if any.

Liquidation

In the event of a liquidation, dissolution or winding up of the affairs of our Company, whether voluntary or involuntary, after payment of our debts and other liabilities and making provision for the holders of outstanding shares of preferred stock, if any, we will distribute the remainder of our assets ratably among the holders of shares of common stock.

Rights and preferences

The common stock has no preemptive, redemption, conversion or subscription rights. The rights, powers, preferences and privileges of holders of common stock are subject to, and may be impaired by, the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Stock options and restricted stock units

As of March 31, 2018, options to purchase 11,546,434 shares of our common stock were outstanding, of which options to purchase 6,533,996 shares of our common stock were exercisable. As of March 31, 2018, there were 1,052,182 restricted stock units outstanding.

Warrants

As of March 31, 2018, we had outstanding warrants to purchase shares of our common stock that will be exercisable for an aggregate of 133,264 shares of our common stock. Each of these warrants was and remains exercisable in full.

Registration rights

We have entered into an investors' rights agreement with certain of our shareholders who will have the right to require us to register their shares under the Securities Act under specified circumstances and will have incidental registration rights as described below. After registration pursuant to these rights, these shares will become freely tradable without restriction under the Securities Act.

Certain holders who were issued shares of our common stock upon the consummation of our acquisition of Trans Ova Genetics, L.C. will have the right to require us to register these shares under the Securities Act under specified circumstances. After registration pursuant to these rights, these shares will become freely tradable without restriction under the Securities Act.

Demand registration rights

Certain holders, or Demand Holders, have demand registration rights. Beginning on February 4, 2014, subject to specified limitations set forth in the investor rights agreement, at any time the Demand Holders who are holders of at least 75 percent of the then-outstanding registrable securities, as defined in the investor rights agreement, of all Demand Holders as a class, acting together, may demand in writing that we register their registrable securities under the Securities Act. We are not obligated to file a registration statement pursuant to this demand provision on more than two occasions, subject to specified exceptions.

In addition, subject to specified limitations, the holders of registrable securities may demand in writing that we register on Form S-3 the registrable securities held by them so long as the total amount of registrable securities being registered has an aggregate offering price of at least \$500,000. We are not obligated to file a Form S-3 pursuant to this provision within 12 months of the effective date of any other Form S-3 registration statement that we may file.

In addition, certain holders who entered into securities purchase agreements with us on March 26, 2014, or March 2014 Investors, have demand registration rights. Any March 2014 Investor who purchased at least \$10.0 million of our common stock in the March 2014 private placement has the right to require us to register such shares of our common stock on a registration statement on Form S-3, if available for use.

Incidental registration rights

If we propose to file a registration statement to register any of our securities under the Securities Act for our own account, other than pursuant to a Form S-4 or Form S-8, the holders of our registrable securities are entitled to notice of registration and, subject to specified exceptions, we will be required to register the registrable securities then held by them that they request that we register. The holders of these registrable securities may be deemed to have such rights with respect to offerings under any prospectus supplement.

Expenses

Pursuant to the investor rights agreement, we are required to pay all registration expenses, including all registration, filing and qualification fees, printers' and accounting fees, fees and expenses incurred in connection with complying with state securities or "blue sky" laws, fees and expenses of listing registrable securities on any securities exchange on which shares of our common stock are then listed, fees and

disbursements of our counsel, but excluding any underwriting discounts and commissions, related to any demand or incidental registration. The investor rights agreement contains customary cross-indemnification provisions, pursuant to which we are obligated to indemnify the selling shareholders in the event of material misstatements or omissions in the registration statement attributable to us, and they are obligated to indemnify us for material misstatements or omissions in the registration statement attributable to them.

Preferred stock

As of March 31, 2018, we have no shares of preferred stock issued or outstanding. Our amended and restated articles of incorporation authorize our board to designate and issue from time to time one or more series of preferred stock without shareholder approval. Our board may fix and determine the preferences, limitations and relative rights of each series of preferred stock issued. Because our board has the power to establish the preferences and rights of each series of preferred stock, it may afford the holders of any series of preferred stock preferences and rights, voting or otherwise, senior to the rights of holders of our common stock. It is not possible to state the actual effect of the issuance of any shares of preferred stock upon the rights of holders of common stock until our board determines the specific rights of the holders of preferred stock. However, the effects might include:

- restricting dividends on our common stock;
- diluting the voting power of our common stock;
- impairing liquidation rights of our common stock; or
- delaying or preventing a change in control of us without further action by our shareholders.

We have no present plans to issue any shares of preferred stock except as described under “—Series A Preferred Stock”.

Series A Preferred Stock

On October 16, 2017, we entered into a Preferred Stock Equity Facility Agreement with Kapital Joe, LLC, an entity managed by Third Security, LLC, pursuant to which we may, at our sole and exclusive option, issue and sell to Kapital Joe, from time to time, and Kapital Joe, LLC is required to purchase, up to \$100 million of our Series A Redeemable Preferred Stock, no par value per share (the “Series A Preferred Stock”), at a purchase price per share of Series A Preferred Stock of \$100.00, as may be adjusted for Preferred Stock splits and similar events (the “Preferred Stock Facility”). Randal J. Kirk our Chairman and Chief Executive Officer, serves as the Senior Managing Director and Chief Executive Officer and owns all of the outstanding equity interests of Third Security, LLC.

The Series A Preferred Stock is non-voting, accrues dividends of 8% per annum and, subject to limited exceptions, upon issuance will be senior to our common stock with respect to the rights to the payment of dividends and on parity with our common stock with respect to the distribution of assets in the event of any liquidation, dissolution or winding up or change of control of the Company.

The Series A Preferred Stock will be convertible into shares of our common stock following the approval of our shareholders, including a majority of the shares voted by shareholders unaffiliated with Mr. Kirk and, to the extent applicable to Kapital Joe, LLC, approval under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended. The Series A Preferred Stock will convert at a conversion price equal to the 20-day volume-weighted average market price of our common stock as of the market close on the fifth business day prior to the mailing of the proxy statement soliciting such shareholder approval, subject to adjustment for certain stock

splits and similar events. We have agreed to take all reasonable steps necessary to seek such shareholder approval on or before the date of our annual meeting of shareholders in 2019. The Series A Preferred Stock will automatically convert after receipt of such shareholder approval, subject to receiving any required regulatory approvals. In addition, prior to conversion, in the event of any voluntary or involuntary liquidation, dissolution or winding up or change of control of the Company, the holders of the Series A Preferred Stock will be entitled to participate with the holders of our common stock on a *pro rata*, as-converted basis, based on a deemed conversion rate of \$18.96, which was calculated using the 20-day volume-weighted average market price of our common stock as of market closing on October 13, 2017, subject to adjustment for certain stock splits and similar events.

The Series A Preferred Stock is redeemable at our election at any time, or at the election of Kapital Joe, LLC after December 31, 2020.

The Preferred Stock Facility will expire on the earliest to occur of: (i) the date on which Kapital Joe has purchased shares of Series A Preferred Stock in the aggregate amount of \$100 million, (ii) April 30, 2019, (iii) the date of shareholder approval and (iv) the mutual agreement of the parties.

No shares of Series A Preferred Stock are currently outstanding and the Company intends to terminate the Preferred Stock Facility upon the closing of this offering.

Anti-takeover effects of provisions of our charter and bylaws and of Virginia law

Our amended and restated articles of incorporation, bylaws and Virginia law contain provisions that may have the effect of impeding the acquisition of control of us by means of a tender offer, a proxy contest, open market purchases or otherwise in a transaction not approved by our board of directors. These provisions are designed to reduce, or have the effect of reducing, our vulnerability to coercive takeover practices and inadequate takeover bids. The existence of these provisions could limit the price that investors might otherwise pay in the future for shares of common stock. In addition, these provisions make it more difficult for our shareholders to remove our board of directors or management, should they choose to do so.

Articles of incorporation and bylaws

Preferred stock

Our amended and restated articles of incorporation authorize our board to establish one or more series of preferred stock and to determine, with respect to any series of preferred stock, the preferences, rights and other terms of such series. See "Preferred Stock" above for additional information. Under this authority, our board could create and issue a series of preferred stock with rights, preferences or restrictions that have the effect of discriminating against an existing or prospective holder of our capital stock as a result of such holder beneficially owning or commencing a tender offer for a substantial amount of our common stock. One of the effects of authorized but unissued and unreserved shares of preferred stock may be to render it more difficult for, or to discourage an attempt by, a potential acquiror to obtain control of us by means of a merger, tender offer, proxy contest or otherwise, and thereby protect the continuity of our management. The issuance of shares of preferred stock may have the effect of delaying, deferring or preventing a change in control of our Company without any action by our shareholders.

Qualification and election of directors

Our bylaws provide that to be eligible to be a nominee for election to our board of directors, a person must submit a written questionnaire regarding his or her background and qualifications and must agree to other representations as set forth in our bylaws. In addition, we have adopted a director resignation policy. The

director resignation policy is incorporated into our bylaws and Corporate Governance Guidelines and provides that any nominee for director in an uncontested election who receives a greater number of votes “withheld” from his or her election than votes “for” his or her election must tender his or her resignation to the board of directors for consideration in accordance with the procedures set forth in our Corporate Governance Guidelines. The Nominating and Governance Committee will then evaluate the best interests of us and our shareholders and will recommend to the board of directors the action to be taken with respect to the tendered resignation. Following the board of directors’ determination, we will promptly publicly disclose the board of directors’ decision of whether or not to accept the resignation and an explanation of how the decision was reached, including, if applicable, the reasons for rejecting the resignation.

Board vacancies; removal

Our amended and restated articles of incorporation provide that any vacancy occurring on our board of directors may be filled by a majority of directors then in office, even if less than a quorum.

Special meetings of shareholder

Our bylaws provide that the vote of 25 percent of our shareholders is required to call a special meeting, and that shareholders may only conduct business at special meetings of shareholders that was specified in the notice of the meeting.

Advance notification of shareholder nominations and proposals

Our amended and restated bylaws establish advance notice procedures with respect to shareholder proposals and the nomination of persons for election as directors, other than nominations made by or at the direction of our board.

Virginia anti-takeover statutes

Affiliated transactions statute

Virginia law contains provisions governing affiliated transactions. In general, these provisions prohibit a Virginia corporation from engaging in affiliated transactions with any holder of more than 10 percent of any class of its outstanding voting shares, or an interested shareholder, for a period of three years following the date that such person became an interested shareholder unless:

- a majority of (but not fewer than two) disinterested directors of the corporation and the holders of two-thirds of the voting shares, other than the shares beneficially owned by the interested shareholder, approve the affiliated transaction; or
- before or on the date the person became an interested shareholder, a majority of disinterested directors approved the transaction that resulted in the shareholder becoming an interested shareholder.

Affiliated transactions subject to this approval requirement include mergers, share exchanges, material dispositions of corporate assets not in the ordinary course of business, any dissolution of the corporation proposed by or on behalf of an interested shareholder or any reclassification, including reverse stock splits, recapitalizations or mergers of the corporation with its subsidiaries, which increases the percentage of voting shares owned beneficially by an interested shareholder by more than five percent.

Virginia law permits a corporation to exempt itself from this statutory provision by placing a statement to that effect in its articles of incorporation. Our amended and restated articles of incorporation do not specifically address the Virginia statute regarding affiliated transactions; therefore, we are subject to this provision.

Control share acquisitions statute

Virginia law also contains provisions relating to control share acquisitions, which are transactions causing the voting strength of any person acquiring beneficial ownership of shares of a Virginia public corporation to meet or exceed certain threshold percentages (20 percent, 33¹/₃ percent or 50 percent) of the total votes entitled to be cast for the election of directors. Shares acquired in a control share acquisition have no voting rights unless:

- the voting rights are granted by a majority vote of all outstanding shares other than those held by the acquiring person or any officer or employee director of the corporation; or
- the articles of incorporation or bylaws of the corporation provide that these Virginia law provisions do not apply to acquisitions of its shares.

The acquiring person may require that a special meeting of the shareholders be held within 50 days of the acquiring person's request to consider the grant of voting rights to the shares acquired in the control share acquisition. If voting rights are not granted and the corporation's articles of incorporation or bylaws permit, the acquiring person's shares may be repurchased by the corporation, at its option, at a price per share equal to the acquiring person's cost. Virginia law grants dissenters' rights to any shareholder who objects to a control share acquisition that is approved by a vote of disinterested shareholders and that gives the acquiring person control of a majority of the corporation's voting shares.

Our amended and restated articles of incorporation provide that this second statutory provision does not apply to our Company; therefore, we are not subject to this provision.

Indemnification and limitation of directors' and officers' liability

The Virginia Stock Corporation Act and our articles of incorporation provide for indemnification of our directors and officers in a variety of circumstances, which may include liabilities under the Securities Act. Virginia law provides that, unless limited by its articles of incorporation, a corporation must indemnify a director or officer who entirely prevails in the defense of any proceeding to which he was a party because he is or was a director or officer of the corporation against reasonable expenses incurred by him in connection with the proceeding. Virginia law permits a corporation to indemnify, after a determination has been made that indemnification of the director is permissible in the circumstances because he has met the following standard of conduct, an individual made a party to a proceeding because he is or was a director against liability incurred in the proceeding if:

- he conducted himself in good faith;
- he believed in the case of conduct in his official capacity with the corporation, that his conduct was in its best interests and in all other cases that his conduct was at least not opposed to its best interests; and
- in the case of any criminal proceeding, he had no reasonable cause to believe his conduct was unlawful.

A Virginia corporation may not indemnify a director in connection with a proceeding by or in the right of the corporation in which the director was adjudged liable to the corporation or in connection with any other proceeding charging improper personal benefit to him, whether or not involving action in his official capacity, in which he was adjudged liable on the basis that personal benefit was improperly received by him, unless in either case a court orders indemnification and then only for expenses. In addition, the Virginia Stock Corporation Act permits a corporation to advance reasonable expenses to a director or officer, and our articles of incorporation provide that we will advance such expenses upon the corporation's receipt of:

- a written affirmation by the director or officer of his good faith belief that he has met the standard of conduct necessary for indemnification by the company; and

- a written undertaking by the director or on the director's behalf to repay the amount paid or reimbursed by the corporation if it is ultimately determined that the director is not entitled to indemnification and did not meet the relevant standard of conduct.

In addition, Virginia law permits a corporation to make any further indemnity, including indemnity with respect to a proceeding by or in the right of the corporation, and to make additional provision for advances and reimbursement of expenses, to any director or officer that may be authorized by the articles of incorporation or any bylaw made by the shareholders or any resolution adopted by the shareholders, except an indemnity against his willful misconduct or a knowing violation of the criminal law.

In addition, the Virginia Stock Corporation Act permits a Virginia corporation to limit the personal liability of an officer or director in any proceeding brought by or in the name of the corporation or its shareholders, except if the director or officer engaged in willful misconduct or a knowing violation of the criminal law or any federal or state securities laws, including insider trading or market manipulation.

Our articles of incorporation require indemnification of directors and officers with respect to certain liabilities, expenses, and other amounts imposed on them by reason of having been a director or officer, except in the case of willful misconduct or a knowing violation of criminal law. Our articles of incorporation also limit the liability of our officers and directors to the extent not prohibited by Virginia law. We also carry insurance on behalf of directors, officers, employees or agents which may cover liabilities under the Securities Act.

Insofar as the foregoing provisions permit indemnification of directors, officers or persons controlling us for liability arising under the Securities Act, we have been informed that in the opinion of the SEC, this indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

Listing on the New York Stock Exchange

Our common stock is listed on the New York Stock Exchange under the symbol "XON."

Authorized but unissued shares

The authorized but unissued shares of common stock and preferred stock are available for future issuance without shareholder approval, subject to any limitations imposed by the New York Stock Exchange listing rules. These additional shares may be used for a variety of corporate finance transactions, acquisitions and employee benefit plans. The existence of authorized but unissued and unreserved common stock and preferred stock could make it more difficult or discourage an attempt to obtain control of us by means of a proxy contest, tender offer, merger or otherwise.

Transfer agent and registrar

The transfer agent and registrar for the common stock is American Stock Transfer & Trust Company, LLC.

Material U.S. federal tax consequences to non-U.S. holders of common stock

The following is a summary of the material U.S. federal income tax consequences of the acquisition, ownership and disposition of shares of our common stock purchased pursuant to this offering by a beneficial owner that is a “non-U.S. holder.” As used in this summary, a non-U.S. holder means a beneficial owner of our common stock that is not a partnership (or other entity treated as a partnership for U.S. federal income tax purposes regardless of its place of organization or formation), an entity that is treated as a disregarded entity for U.S. federal income tax purposes (regardless of its place of organization or formation) or any of the following:

- a citizen or individual resident of the United States;
- a corporation (or other entity treated as a corporation for U.S. federal income tax purposes) created or organized in or under the laws of the United States, any state thereof or the District of Columbia;
- an estate the income of which is subject to U.S. federal income taxation regardless of its source; or
- a trust (1) which is subject to primary supervision by a court situated within the United States and as to which one or more U.S. persons (within the meaning of Section 7701(a)(30) of the Code) have the authority to control all substantial decisions of the trust or (2) that has a valid election in effect under applicable U.S. Treasury regulations to be treated as a U.S. person for U.S. federal income tax purposes.

This summary is based on current provisions of the Internal Revenue Code of 1986, as amended, which we refer to as the Code, final, temporary, and proposed Treasury regulations promulgated under the Code, judicial opinions, and administrative pronouncements and published rulings of the U.S. Internal Revenue Service, or the IRS, all as in effect as of the date of this prospectus supplement. Changes to any of these authorities after the date of this prospectus supplement may affect the tax consequences described in this summary, or the IRS might interpret the existing authorities differently. In either case, the tax considerations of acquiring, owning or disposing of our common stock could differ from those described below. We have not requested a ruling from the IRS with respect to the statements made and the conclusions reached in the following summary, and we cannot assure you that the IRS will agree with those statements and conclusions. This discussion assumes that a non-U.S. holder holds our common stock as a “capital asset” within the meaning of Section 1221 of the Code (generally, property held for investment).

This summary does not address all aspects of U.S. federal income taxation and does not address any estate or gift tax issues, the impact of the Medicare contribution tax on net investment income, the alternative minimum tax, or any tax consequences arising under any tax law other than U.S. federal income tax law or under the laws of any state, local or foreign jurisdiction. Special rules different from those described below may be relevant to non-U.S. holders in light of their particular circumstances, such as non-U.S. holders subject to special tax treatment under U.S. federal tax laws (including pass-through entities, “controlled foreign corporations,” “passive foreign investment companies,” financial institutions and insurance companies, tax-exempt organizations or governmental organizations, dealers in securities, holders of securities held as part of a “straddle,” “hedge,” “conversion transaction” or other risk-reduction transaction, corporations that accumulate earnings to avoid U.S. federal income tax, persons deemed to sell our common stock under the constructive sale provisions of the Code, tax-qualified retirement plans and U.S. expatriates and former citizens or residents of the United States). Such non-U.S. holders should consult their own tax advisors to determine the U.S. federal and other tax consequences that may be relevant to them. If a partnership (including any entity treated as a partnership for U.S. federal income tax purposes) is a holder of our common stock, the tax treatment of a partner in the partnership generally will depend on the status of the partner, the partnership’s activities and certain determinations made at the partner level. A holder that is a partnership, and partners in such a

partnership, should consult their own tax advisors regarding the tax consequences of the acquisition, ownership and disposition of shares of our common stock.

THE FOLLOWING DISCUSSION IS INTENDED AS A GENERAL SUMMARY ONLY AND IS NOT TAX ADVICE. YOU ARE URGED TO CONSULT YOUR OWN TAX ADVISORS AS TO THE SPECIFIC TAX CONSEQUENCES OF THE ACQUISITION, OWNERSHIP OR DISPOSITION OF OUR COMMON STOCK, INCLUDING THE APPLICABLE FEDERAL, STATE, LOCAL AND FOREIGN TAX CONSEQUENCES IN LIGHT OF YOUR OWN PARTICULAR TAX SITUATION AND ANY APPLICABLE TAX TREATY.

Distributions

We do not currently expect to pay dividends on our common stock. If we do make distributions on our common stock, such distributions paid to a non-U.S. holder will constitute dividends for U.S. federal income tax purposes to the extent such distributions are paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. If a distribution exceeds our current and accumulated earnings and profits, the excess will be treated as a tax-free return of the non-U.S. holder's investment to the extent of the non-U.S. holder's adjusted tax basis in our common stock, and any remaining excess will be treated as capital gain from the disposition of our common stock. See "—Gain on Disposition of Common Stock" below for additional information. Any such distributions will also be subject to the discussions below regarding backup withholding and the Foreign Account Tax Compliance Act, or FATCA.

Dividends paid to a non-U.S. holder generally will be subject to withholding of U.S. federal income tax at a 30% rate or such lower rate as may be specified by an applicable income tax treaty. A non-U.S. holder of common stock who wishes to claim the benefit of an applicable treaty rate for dividends generally will be required to submit a completed IRS Form W-8BEN or W-8BEN-E (or other applicable form) to us or our paying agent and certify, under penalty of perjury, that the holder is not a U.S. person and is eligible for the benefits with respect to dividends allowed by the treaty. If the holder holds the stock through a financial institution or other agent acting on the holder's behalf, the holder will be required to provide appropriate documentation to the agent. The holder's agent then will be required to provide certification to us or our paying agent, either directly or through other intermediaries. In the case of a non-U.S. holder that is an entity, Treasury regulations and the relevant tax treaty provide rules to determine whether, for purposes of determining the applicability of a tax treaty, dividends will be treated as paid to the entity or to those holding an interest in that entity. If a non-U.S. holder is eligible for a reduced rate of U.S. withholding tax pursuant to an income tax treaty, the non-U.S. holder should contact its tax advisor regarding the possibility of obtaining a refund or credit of any excess amounts withheld by timely filing an appropriate claim for a refund with the IRS.

The withholding tax generally does not apply to dividends paid to a non-U.S. holder who provides a Form W-8ECI to us (or if stock is held through a financial institution or other agent, to such agent), certifying that dividends are effectively connected with the non-U.S. holder's conduct of a trade or business within the United States. Instead, the effectively connected dividends will be subject to U.S. federal income tax on a net income basis at the regular graduated rates as if the non-U.S. person were a U.S. resident. A corporate non-U.S. holder also may be subject to an additional "branch profits tax," which is imposed at a rate of 30% (or a lower rate as may be specified by an applicable income tax treaty) on that portion of the holder's earnings and profits that is effectively connected with its U.S. trade or business. Non-U.S. holders should consult their tax advisors regarding whether an applicable income tax treaty provides for a different result with respect to effectively connected dividends.

Gain on disposition of common stock

Subject to the discussions below regarding backup withholding and FATCA, a non-U.S. holder generally will not be subject to U.S. federal income tax on the gain realized on a sale or other disposition of common stock unless:

- the gain is effectively connected with a trade or business of the non-U.S. holder in the United States, and, where a tax treaty applies, is attributable to a U.S. permanent establishment of the non-U.S. holder;
- the non-U.S. holder is a non-resident alien individual who is present in the United States for 183 or more days during the taxable year of disposition and meets certain other requirements; or
- we are or have been a “U.S. real property holding corporation” within the meaning of Section 897(c)(2) of the Code, also referred to as a USRPHC, for U.S. federal income tax purposes at any time within the shorter of the five-year period preceding the disposition or the non-U.S. holder’s holding period for the common stock.

Gain recognized on the sale or other disposition of common stock and effectively connected with a U.S. trade or business (and, if required by an applicable income tax treaty, attributable to a U.S. permanent establishment of the non-U.S. holder), is subject to graduated U.S. federal income tax on a net income basis generally in the same manner as if the non-U.S. holder were a U.S. person, as defined under the Code. Under certain circumstances, any such effectively connected gain from the sale or disposition of common stock received by a corporate non-U.S. holder may be subject to an additional “branch profits tax” at a 30% rate or a lower rate as may be specified by an applicable income tax treaty.

An individual non-U.S. holder who is present in the United States for 183 or more days during the taxable year of disposition generally will be subject to a flat 30% tax imposed on the gain derived from the sale or other disposition of our common stock, which may be offset by certain U.S. source capital losses realized in the same taxable year, provided the non-U.S. holder has timely filed U.S. federal income tax returns with respect to such losses.

In general, a corporation is a USRPHC if the fair market value of its “U.S. real property interests” equals or exceeds 50% of the sum of the fair market value of its worldwide (domestic and foreign) real property interests and its other assets used or held for use in a trade or business. For this purpose, real property interests include land, improvements and associated personal property. We believe that we currently are not a USRPHC and we do not anticipate becoming a USRPHC. However, because the determination of whether we are a USRPHC depends on the fair market value of our “U.S. real property interests” relative to the fair market value of our non-U.S. real property interests and our other business assets, there can be no assurance we currently are not a USRPHC or will not become one in the future.

If we have been or become a USRPHC, a non-U.S. holder nevertheless will not be subject to U.S. federal income tax if our common stock is regularly traded on an established securities market, within the meaning of applicable Treasury regulations, and the non-U.S. holder holds no more than 5% of our outstanding common stock, directly, indirectly or constructively, at all times within the shorter of the five-year period preceding the disposition or the holder’s holding period. Our common stock is listed on the NYSE and we expect that our common stock may be regularly traded on an established securities market in the United States as long as it is so listed.

Information reporting and backup withholding

We (or the applicable withholding agent) must report annually to the IRS and to each non-U.S. holder the amount of dividends paid to such holder and the tax withheld with respect to those dividends, regardless of whether withholding was required. Copies of the information returns reporting dividends and withholding also

may be made available to the tax authorities in the country in which the non-U.S. holder resides under the provisions of an applicable income tax treaty.

The United States imposes a backup withholding tax on dividends and some other types of payments to U.S. persons (currently at a rate of 24%). Dividends paid to a non-U.S. holder generally will not be subject to backup withholding if proper certification of foreign status on a properly executed IRS Form W-8BEN or W-8BEN-E (or other applicable form) is provided and the payor does not have actual knowledge or reason to know that the beneficial owner is a U.S. person, or if the holder is a corporation or one of several types of entities and organizations that qualify for an exemption.

Under current U.S. federal income tax law, U.S. information reporting and backup withholding requirements generally will apply to the proceeds of a disposition of our common stock effected by or through a U.S. office of any U.S. or foreign broker, except that information reporting and such requirements may be avoided if the holder provides a properly executed IRS Form W-8BEN or W-8BEN-E (or other applicable form) or otherwise meets documentary evidence requirements for establishing non-U.S. holder status, or otherwise establishes an exemption. Generally, U.S. information reporting and backup withholding requirements will not apply to a payment of disposition proceeds to a non-U.S. holder where the transaction is effected outside the United States through a non-U.S. office of a non-U.S. broker. Information reporting and backup withholding requirements, however, may apply to a payment of disposition proceeds if the broker has actual knowledge, or reason to know, that the holder is, in fact, a U.S. person. For information reporting purposes, certain brokers with substantial U.S. ownership or operations generally will be treated in a manner similar to U.S. brokers.

Backup withholding is not an additional tax. A non-U.S. holder subject to backup withholding should contact the holder's tax advisor regarding the possibility of obtaining a refund or a tax credit and any associated requirements to provide information to the IRS or other relevant tax authority.

Legislation affecting taxation of our common stock held by or through foreign entities

Legislation commonly known as the Foreign Account Tax Compliance Act, or FATCA, imposes a 30% withholding tax on certain types of payments made to "foreign financial institutions" and other specified non-U.S. entities unless due diligence, reporting, withholding and certification requirements are satisfied.

The Treasury Department and the IRS have issued final regulations under FATCA. As a general matter, FATCA imposes a 30% withholding tax on dividends on, and gross proceeds from the sale or other disposition of, our common stock if paid to a foreign entity unless:

- the foreign entity is a "foreign financial institution" that undertakes specified due diligence, reporting, withholding and certification obligations or, in the case of a foreign financial institution that is a resident in a jurisdiction that has entered into an intergovernmental agreement to implement FATCA, the entity complies with the diligence and reporting requirements of such an agreement;
- the foreign entity is not a "foreign financial institution" and identifies certain of its U.S. investors; or
- the foreign entity otherwise is exempted under FATCA.

An intergovernmental agreement between the United States and an applicable non-U.S. government may modify these rules. Withholding is required with respect to dividends on our common stock and, for sales or other dispositions that occur on or after January 1, 2019, with respect to gross proceeds from a sale or other disposition of our common stock.

If withholding is imposed under FATCA on a payment related to our common stock, a beneficial owner that is not a foreign financial institution and that otherwise would not be subject to withholding (or that otherwise

would be entitled to a reduced rate of withholding) generally may obtain a refund from the IRS by filing a U.S. federal income tax return (which may entail significant administrative burden). Prospective investors should consult their tax advisors regarding the effect of FATCA in their particular circumstances.

Underwriting; conflicts of interest

Under the terms and subject to the conditions in the underwriting agreement and the share lending agreement, we have agreed to loan to the underwriter the shares of our common stock (the “borrowed shares”) listed below. Only the number of borrowed shares listed below will be subject to offering and sale pursuant to this prospectus supplement.

Name	Number of borrowed shares(1)
J.P. Morgan Securities LLC	
Total	

See “Description of share lending agreement” and “Concurrent offering of convertible senior notes”.

The underwriter is offering the borrowed shares subject to its acceptance of the borrowed shares. The obligation of the underwriter to accept delivery of the borrowed shares offered by this prospectus supplement and the accompanying prospectus is subject to the approval of certain legal matters by its counsels and to certain other customary conditions, as well as additional conditions relating to the borrowed shares.

The borrowed shares may be offered for sale in transactions, including block sales, on The New York Stock Exchange, in the over-the-counter market, in negotiated transactions or otherwise. The underwriter initially proposes to offer the borrowed shares directly to the public at the offering price listed on the cover page of this prospectus supplement. Randal J. Kirk, our Chairman, Chief Executive Officer and principal shareholder, has indicated that he or an entity with which he is affiliated may have interest in purchasing at the public offering price up to all of the borrowed shares offered in this offering. The ultimate allocation of the borrowed shares will be determined by the underwriter, and Mr. Kirk or such entity may or may not purchase some or all of the borrowed shares. After the initial offering of the shares to the public, if all of the common shares are not sold at the initial public offering price, the underwriter may change the offering price and the other selling terms. Sales of shares made outside of the United States may be made by affiliates of the underwriter.

The underwriter will not receive underwriting discounts and commissions in connection with this offering.

We estimate that the total expenses of this offering, including registration, filing and listing fees, printing fees and legal and accounting expenses will be approximately \$275,000. We have agreed to reimburse the underwriter for all expenses incurred in connection with the registration or qualification of the shares issued in this offering under state or foreign or blue sky laws (in an amount not to exceed \$30,000).

A prospectus in electronic format may be made available on the web sites maintained by the underwriter, or selling group members, if any, participating in the offering. The underwriter may agree to allocate a number of shares to selling group members for sale to their online brokerage account holders. Internet distributions will be allocated by the underwriter to selling group members that may make Internet distributions on the same basis as other allocations.

We have agreed that we will not (i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, or file with the SEC a registration statement under the Securities Act relating to, any shares of our common stock or securities convertible into or exchangeable or exercisable for any shares of our common stock, or publicly disclose the intention to make any offer, sale, pledge, disposition or filing (other than filings on Form S-8 relating to outstanding company stock plans that are disclosed in the Prospectus), or (ii) enter into any swap or other arrangement that transfers all or a portion of the economic consequences associated with the ownership of any shares of common stock or any such other securities

(regardless of whether any such transaction described in (i) or (ii) is to be settled by the delivery of shares of common stock or such other securities, in cash or otherwise), in each case without the prior written consent of J.P. Morgan Securities LLC for a period of 90 days after the date of this prospectus, other than the shares of our common stock to be sold hereunder; the convertible notes issued in our concurrent offering of convertible notes and any shares of our common stock issued upon conversion of the convertible notes; any equity awards granted under company stock plans in the ordinary course of business consistent with past practice; any shares of our common stock issued upon the exercise of options granted under company stock plans or outstanding warrants; and the issuance of a limited number of shares of our common stock in connection with mergers or acquisitions of businesses, entities, property or other assets, joint ventures or strategic alliances.

Our directors and executive officers, and all affiliates of Mr. Kirk holding our common stock have entered into lock-up agreements with the underwriters of our concurrent offering of convertible notes prior to the commencement of our concurrent offering of convertible notes pursuant to which each of these persons or entities, with limited exceptions, for a period of 90 days after the date of the prospectus in respect of our concurrent offering of convertible notes, may not, without the prior written consent of J.P. Morgan Securities LLC, (i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for our common stock (including, without limitation, common stock or such other securities which may be deemed to be beneficially owned by such directors, executive officers, shareholders, managers and members in accordance with the rules and regulations of the SEC and securities which may be issued upon exercise of a stock option or warrant), or publicly disclose the intention to make any offer, sale, pledge or disposition, (ii) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of the common stock or such other securities, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of common stock or such other securities, in cash or otherwise, or (iii) make any demand for or exercise any right with respect to the registration of any shares of our common stock or any security convertible into or exercisable or exchangeable for our common stock. These lock-up restrictions are subject to limited exceptions that are specified in the lock-up agreements.

We have agreed to indemnify the underwriter against certain liabilities, including liabilities under the Securities Act of 1933.

Our common stock is listed on the New York Stock Exchange under the symbol "XON".

In connection with this offering of the borrowed shares, the underwriter may engage in stabilizing transactions, which involve making bids for, purchasing and selling shares of common stock in the open market for the purpose of preventing or retarding a decline in the market price of the common stock while this offering is in progress. These stabilizing transactions may include making short sales of the common stock, which involve the sale by the underwriter of a greater number of shares of common stock than they are required to borrow pursuant to the share lending agreement, and purchasing shares of common stock on the open market to cover positions created by short sales.

These activities may have the effect of raising or maintaining the market price of the common stock or preventing or retarding a decline in the market price of the common stock, and, as a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. If the underwriter commences these activities, it may discontinue them at any time. The underwriter may carry out these transactions on the New York Stock Exchange, in the over the counter market or otherwise.

Share lending agreement

The borrowed shares offered by this prospectus supplement and the accompanying prospectus are shares that we have agreed to loan to the underwriter pursuant to the share lending agreement.

The underwriter has informed us that it, or its affiliates, intend to use the short position created by the share loan and the concurrent short sale by it of the borrowed shares to facilitate transactions by which investors in our convertible notes may hedge their investments through short sales or privately negotiated derivatives transactions. See "Share Lending Agreement; Concurrent Offering of Convertible Notes." J.P. Morgan Securities LLC will determine the offering price of the borrowed shares offered pursuant to this prospectus supplement and the accompanying prospectus by initially soliciting indications of interest from potential purchasers of our common stock and conducting customary negotiations with those potential purchasers during the offering period. The price at which investors in our convertible notes establish their short positions through J.P. Morgan Securities LLC will be the offering price of the borrowed shares offered hereby. During the offering period, J.P. Morgan Securities LLC will negotiate a purchase price with purchasers of our common stock and will solicit indications of interest, based on the purchase price being negotiated with those potential purchasers, from convertible note investors seeking to establish a short position in our common stock. J.P. Morgan Securities LLC will establish a "clearing price" for the borrowed shares at which both purchasers of our common stock are willing to purchase borrowed shares offered hereby and investors in our convertible notes are willing to establish short positions. The clearing price will be the offering price hereunder. Randal J. Kirk, our Chairman, Chief Executive Officer and principal shareholder, has indicated that he or an entity with which he is affiliated may have interest in purchasing at the public offering price up to all of the borrowed shares offered in this offering. The ultimate allocation of the borrowed shares will be determined by the underwriter, and Mr. Kirk or such entity may or may not purchase some or all of the borrowed shares.

In addition, in connection with facilitating such transactions, J.P. Morgan Securities LLC expects to receive customary negotiated fees from investors in our convertible notes, which may be deemed to be underwriter's compensation. J.P. Morgan Securities LLC may engage in such transactions at any time and from time to time during the term of the share lending agreement.

We will not receive any proceeds from the sale of borrowed shares of our common stock pursuant to this prospectus supplement and accompanying prospectus.

The delivery of the borrowed shares being offered hereby is contingent upon the closing of the offering of convertible notes, and the closing of the offering of convertible notes is contingent upon the delivery by us of the borrowed shares pursuant to the share lending agreement.

Certain relationships

The underwriter and its affiliates have provided in the past to us and our affiliates and may provide from time to time in the future certain commercial banking, financial advisory, investment banking and other services for us and such affiliates in the ordinary course of their business, for which they have received and may continue to receive customary fees and commissions. In addition, from time to time, the underwriter and its affiliates may effect transactions for their own account or the account of customers, and hold on behalf of themselves or their customers, long or short positions in our debt or equity securities or loans, and may do so in the future. The underwriter of the borrowed shares offered hereby is also an underwriter of our concurrent offering of convertible notes.

Steven Frank, one of our directors, currently serves as Chairman of Global Healthcare Investment Banking at J.P. Morgan Securities LLC.

Conflicts of interest

All of the proceeds from the sale of the borrowed shares in this offering will be paid to J.P. Morgan Securities LLC. As a result, J.P. Morgan Securities LLC will receive more than 5% of the net proceeds of this offering. Thus, J.P. Morgan Securities LLC has a “conflict of interest” as defined in Rule 5121 (Public Offerings of Securities with Conflicts of Interest) of the Financial Industry Regulatory Authority, Inc. Accordingly, this offering is being made in compliance with the requirements of Rule 5121. In accordance with Rule 5121, any underwriter that has a conflict of interest pursuant to Rule 5121 will not make sales to discretionary accounts without the prior written consent of the customer. The appointment of a “qualified independent underwriter” is not required in connection with this offering as a “bona fide public market,” as defined in Rule 5121, exists for our common stock.

Selling restrictions

Other than in the United States, no action has been taken by us or the underwriter that would permit a public offering of the securities offered by this prospectus supplement and the accompanying prospectus in any jurisdiction where action for that purpose is required. The securities offered by this prospectus supplement and the accompanying prospectus may not be offered or sold, directly or indirectly, nor may this prospectus supplement and the accompanying prospectus or any other offering material or advertisements in connection with the offer and sale of any such securities be distributed or published in any jurisdiction, except under circumstances that will result in compliance with the applicable rules and regulations of that jurisdiction. Persons into whose possession this prospectus supplement and the accompanying prospectus come are advised to inform themselves about and to observe any restrictions relating to the offering and the distribution of this prospectus supplement and the accompanying prospectus. This prospectus supplement and the accompanying prospectus do not constitute an offer to sell or a solicitation of an offer to buy any securities offered by this prospectus supplement and the accompanying prospectus in any jurisdiction in which such an offer or a solicitation is unlawful.

Notice to prospective investors in the European Economic Area

In relation to each Member State of the European Economic Area (each, a “Relevant Member State”), no offer of shares of our common stock may be made to the public in that Relevant Member State other than:

- A. to any legal entity which is a qualified investor as defined in the Prospectus Directive;
- B. to fewer than 100 or, if the Relevant Member State has implemented the relevant provision of the 2010 PD Amending Directive, 150, natural or legal persons (other than qualified investors as defined in the Prospectus Directive), as permitted under the Prospectus Directive, subject to obtaining the prior consent of the representative; or
- C. in any other circumstances falling within Article 3(2) of the Prospectus Directive,
provided that no such offer of shares of our common stock shall require the Company or the representative to publish a prospectus pursuant to Article 3 of the Prospectus Directive or supplement a prospectus pursuant to Article 16 of the Prospectus Directive.

Each person in a Relevant Member State who initially acquires any shares of our common stock or to whom any offer is made will be deemed to have represented, acknowledged and agreed that it is a “qualified investor” within the meaning of the law in that Relevant Member State implementing Article 2(1)(e) of the Prospectus Directive. In the case of any shares of our common stock being offered to a financial intermediary as that term is used in Article 3(2) of the Prospectus Directive, each such financial intermediary will be deemed to have

represented, acknowledged and agreed that the shares of our common stock acquired by it in the offer have not been acquired on a non-discretionary basis on behalf of, nor have they been acquired with a view to their offer or resale to, persons in circumstances which may give rise to an offer of any shares of our common stock to the public other than their offer or resale in a Relevant Member State to qualified investors as so defined or in circumstances in which the prior consent of the representative has been obtained to each such proposed offer or resale.

The Company, the representative and their affiliates will rely upon the truth and accuracy of the foregoing representations, acknowledgements and agreements.

This prospectus has been prepared on the basis that any offer of shares of our common stock in any Relevant Member State will be made pursuant to an exemption under the Prospectus Directive from the requirement to publish a prospectus for offers of shares of our common stock. Accordingly any person making or intending to make an offer in that Relevant Member State of shares of our common stock which are the subject of the offering contemplated in this prospectus may only do so in circumstances in which no obligation arises for the Company or the underwriter to publish a prospectus pursuant to Article 3 of the Prospectus Directive in relation to such offer. Neither the Company nor the underwriter has authorized, nor do they authorize, the making of any offer of shares of our common stock in circumstances in which an obligation arises for the Company or the underwriter to publish a prospectus for such offer.

For the purpose of the above provisions, the expression "an offer to the public" in relation to any shares of our common stock in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and the shares of our common stock to be offered so as to enable an investor to decide to purchase or subscribe in shares of our common stock, as the same may be varied in the Relevant Member State by any measure implementing the Prospectus Directive in the Relevant Member State and the expression "Prospectus Directive" means Directive 2003/71/EC (including the 2010 PD Amending Directive, to the extent implemented in the Relevant Member States) and includes any relevant implementing measure in the Relevant Member State and the expression "2010 PD Amending Directive" means Directive 2010/73/EU.

Notice to prospective investors in the United Kingdom

In the United Kingdom, this document is being distributed only to, and is directed only at, and any offer subsequently made may only be directed at persons who are "qualified investors" (as defined in the Prospectus Directive) (i) who have professional experience in matters relating to investments falling within Article 19 (5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, as amended (the "Order") and/or (ii) who are high net worth companies (or persons to whom it may otherwise be lawfully communicated) falling within Article 49(2) (a) to (d) of the Order (all such persons together being referred to as "relevant persons").

Any person in the United Kingdom that is not a relevant person should not act or rely on the information included in this document or use it as basis for taking any action. In the United Kingdom, any investment or investment activity that this document relates to may be made or taken exclusively by relevant persons. Any person in the United Kingdom that is not a relevant person should not act or rely on this document or any of its contents.

Notice to prospective investors in Canada

The shares of our common stock may be sold only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 Prospectus Exemptions or

subsection 73.3(1) of the Securities Act (Ontario), and are permitted clients, as defined in National Instrument 31-103 Registration Requirements, Exemptions and Ongoing Registrant Obligations. Any resale of the shares of our common stock must be made in accordance with an exemption from, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this prospectus (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser's province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser's province or territory for particulars of these rights or consult with a legal advisor.

Pursuant to section 3A.3 of National Instrument 33-105 Underwriting Conflicts (NI 33-105), the underwriter is not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

Notice to prospective investors in Switzerland

The shares of our common stock may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange ("SIX") or on any other stock exchange or regulated trading facility in Switzerland. This document does not constitute a prospectus within the meaning of, and has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this document nor any other offering or marketing material relating to the shares of our common stock or the offering may be publicly distributed or otherwise made publicly available in Switzerland.

Neither this document nor any other offering or marketing material relating to the offering, the Company, the shares of our common stock have been or will be filed with or approved by any Swiss regulatory authority. In particular, this document will not be filed with, and the offer of shares of our common stock will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA (FINMA), and the offer of shares of our common stock has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes ("CISA"). The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of shares of our common stock.

Notice to prospective investors in Japan

The shares of our common stock have not been and will not be registered pursuant to Article 4, Paragraph 1 of the Financial Instruments and Exchange Act. Accordingly, none of the shares of our common stock nor any interest therein may be offered or sold, directly or indirectly, in Japan or to, or for the benefit of, any "resident" of Japan (which term as used herein means any person resident in Japan, including any corporation or other entity organized under the laws of Japan), or to others for re-offering or resale, directly or indirectly, in Japan or to or for the benefit of a resident of Japan, except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the Financial Instruments and Exchange Act and any other applicable laws, regulations and ministerial guidelines of Japan in effect at the relevant time.

Notice to prospective investors in Hong Kong

The shares of our common stock have not been offered or sold and will not be offered or sold in Hong Kong, by means of any document, other than (a) to "professional investors" as defined in the Securities and Futures

Ordinance (Cap. 571) of Hong Kong and any rules made under that Ordinance; or (b) in other circumstances which do not result in the document being a “prospectus” as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32) of Hong Kong or which do not constitute an offer to the public within the meaning of that Ordinance. No advertisement, invitation or document relating to the shares of our common stock has been or may be issued or has been or may be in the possession of any person for the purposes of issue, whether in Hong Kong or elsewhere, which is directed at, or the contents of which are likely to be accessed or read by, the public of Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to shares of our common stock which are or are intended to be disposed of only to persons outside Hong Kong or only to “professional investors” as defined in the Securities and Futures Ordinance and any rules made under that Ordinance

Notice to prospective investors in Singapore

This prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of shares of our common stock may not be circulated or distributed, nor may the shares of our common stock be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than (i) to an institutional investor under Section 274 of the Securities and Futures Act, Chapter 289 of Singapore (the “SFA”), (ii) to a relevant person pursuant to Section 275(1), or any person pursuant to Section 275(1A), and in accordance with the conditions specified in Section 275 of the SFA, or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the shares of our common stock are subscribed or purchased under Section 275 of the SFA by a relevant person which is: (a) a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or (b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary of the trust is an individual who is an accredited investor, securities (as defined in Section 239(1) of the SFA) of that corporation or the beneficiaries’ rights and interest (howsoever described) in that trust shall not be transferred within six months after that corporation or that trust has acquired the shares of our common stock pursuant to an offer made under Section 275 of the SFA except:

- to an institutional investor or to a relevant person defined in Section 275(2) of the SFA, or to any person arising from an offer referred to in Section 275(1A) or Section 276(4)(i)(B) of the SFA;
- where no consideration is or will be given for the transfer;
- where the transfer is by operation of law;
- as specified in Section 276(7) of the SFA; or
- as specified in Regulation 32 of the Securities and Futures (Offers of Investments) (Shares and Debentures) Regulations 2005 of Singapore

Legal matters

The validity of the common stock being offered will be passed upon for us by Troutman Sanders LLP, Richmond, Virginia. Goodwin Procter LLP, New York, New York, is counsel for the underwriter and Davis Polk & Wardwell LLP, New York, New York, is special products counsel to the underwriter in connection with this offering.

Experts

The consolidated financial statements of Intrexon Corporation and management's assessment of the effectiveness of internal control over financial reporting (which is included in Management's Report on Internal Control over Financial Reporting) incorporated in this prospectus by reference to the Annual Report on Form 10-K for the year ended December 31, 2017 have been so incorporated in reliance on the report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

The financial statements of ZIOPHARM Oncology, Inc. for the year ended December 31, 2015, incorporated in this preliminary prospectus supplement by reference from the Intrexon Corporation Annual Report on Form 10-K for the year ended December 31, 2017, have been audited by RSM US LLP, an independent registered public accounting firm, as stated in their report thereon, incorporated herein by reference, and have been incorporated in this preliminary prospectus supplement in reliance upon such report and upon the authority of such firm as experts in accounting and auditing.

Where you can find more information

We file annual, quarterly and current reports, proxy statements and other information with the SEC. You can inspect and copy these reports, proxy statements and other information at the public reference facilities of the SEC at the SEC's Public Reference Room located at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the Public Reference Room. The SEC also maintains an internet web site that contains reports, proxy and information statements and other information regarding registrants that file electronically with the SEC (www.sec.gov). Our internet address is www.dna.com. However, the information contained on, or that can be accessed through, our website is not a part of this prospectus supplement or the accompanying prospectus. We have included our website address in this prospectus supplement solely as an inactive textual reference. In addition, you can inspect reports and other information we file at the office of the NYSE, 11 Wall Street, New York, New York 10005.

Statements contained in this prospectus supplement, the accompanying prospectus and any free writing prospectus that we have authorized, or that are incorporated by reference into this prospectus supplement or the accompanying prospectus, about the provisions or contents of any agreement or other document are not necessarily complete. If SEC rules and regulations require that any agreement or document be filed as an exhibit to the registration statement and we file the agreement or document, you should refer to that agreement or document for a complete description of these matters.

We have filed with the SEC a registration statement under the Securities Act with respect to the common stock offered with this prospectus. This prospectus supplement and the accompanying prospectus do not contain all of the information in the registration statement, parts of which we have omitted, as allowed under the rules and regulations of the SEC. You should refer to the registration statement for further information with respect to us and the common stock. You may inspect the registration statement and exhibits without charge at the office of the SEC at 100 F Street, N.E., Washington, D.C. 20549, and you may obtain copies from the SEC at prescribed rates.

Incorporation of certain information by reference

We are incorporating information into this prospectus supplement and the accompanying prospectus by reference, which means that we are disclosing important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is deemed to be part of this prospectus supplement, except to the extent superseded by information contained in this prospectus supplement.

This prospectus supplement incorporates by reference the documents set forth below that have been previously filed with the SEC and any additional documents that we may file with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act prior to the termination of the offering covered by this prospectus supplement, other than those documents or portions of those documents that are deemed not filed, such as information furnished under Items 2.02 and 7.01 of any Current Report on Form 8-K, including related exhibits:

- our Annual Report on Form 10-K for the year ended December 31, 2017, filed on March 1, 2018;
- our Quarterly Report on Form 10-Q for the quarter ended March 31, 2018, filed on May 10, 2018;
- our Definitive Proxy Statement on Schedule 14A filed on April 27, 2018 to the extent incorporated in our Annual Report on Form 10-K for the year ended December 31, 2017;
- our Current Reports on Form 8-K filed on January 2, 2018 (other than matters furnished under Item 7.01), January 19, 2018, April 5, 2018, and June 8, 2018; and
- the description of our common stock, no par value, contained in our Form 8-A filed on August 5, 2013, including any amendment or report filed for the purpose of updating such description.

Statements contained in this prospectus supplement, the accompanying prospectus and any document incorporated by reference as to the contents of any contract, agreement or other document referred to are not necessarily complete, and in each instance reference is made to the copy of the contract, agreement or other document filed as an exhibit to the registration statement or any incorporated document, each statement being so qualified by this reference.

You may obtain copies of any of these filings by contacting us at the address and telephone number indicated below or by contacting the SEC as described above under the section entitled "Where You Can Find More Information." Documents incorporated by reference are available from us without charge, including any exhibits that are specifically incorporated by reference into this prospectus supplement, by requesting them in writing or by telephone at:

Corporate Secretary
Intrexon Corporation
20374 Seneca Meadows Parkway
Germantown, Maryland 20876
(301) 556-9900



INTREXON CORPORATION

DEBT SECURITIES COMMON STOCK PREFERRED STOCK WARRANTS RIGHTS STOCK PURCHASE CONTRACTS STOCK PURCHASE UNITS

We or any selling securityholder may, from time to time, offer and sell in one or more offerings:

- senior or subordinated debt securities;
- shares of our common stock;
- shares of our preferred stock;
- warrants to purchase our debt securities or shares of our common stock or preferred stock, or other securities;
- rights to purchase our debt securities or shares of our common stock or preferred stock, or other securities;
- stock purchase contracts to purchase shares of our common stock or our preferred stock;
- stock purchase units, each representing ownership of a stock purchase contract and any of our debt securities, shares of our common stock or preferred stock, or preferred securities or debt obligations of third parties, including U.S. Treasury securities, any other securities described in the applicable prospectus supplement, or any combination of the foregoing, securing the holder's obligation to purchase shares of our common stock or preferred stock under the stock purchase contracts; or
- any combination thereof.

The debt securities may consist of debentures, notes, bonds or other types of indebtedness. The debt securities, preferred stock, warrants, rights, stock purchase contracts and stock purchase units may be convertible or exercisable or exchangeable for common or preferred stock or other securities of ours.

Our common stock is listed on the New York Stock Exchange under the symbol "XON." If we decide to seek a listing of any securities offered by this prospectus, the applicable prospectus supplement will disclose the exchange or market on which such securities will be listed, if any, or where we have made an application for listing, if any.

We or any selling securityholder may offer and sell our securities to or through one or more underwriters, dealers, agents or other third parties, or directly to one or more purchasers, on a continuous or delayed basis. These securities also may be resold by securityholders, if so provided in a prospectus supplement hereto. We will provide specific terms of any securities to be offered, including the amount, prices and other terms of the securities and information about any selling securityholders, in one or more supplements to this prospectus. The prospectus supplement may also add, update or change information contained in this prospectus. You should read this prospectus and any applicable prospectus supplement carefully before you invest. **This prospectus may not be used to sell securities unless accompanied by a prospectus supplement and/or free writing prospectus.**

INVESTING IN OUR SECURITIES INVOLVES A HIGH DEGREE OF RISK. YOU SHOULD REVIEW CAREFULLY THE RISKS AND UNCERTAINTIES REFERENCED UNDER THE HEADING "[RISK FACTORS](#)" ON PAGE 7 OF THIS PROSPECTUS AS WELL AS THOSE CONTAINED IN THE APPLICABLE PROSPECTUS SUPPLEMENT AND ANY RELATED FREE WRITING PROSPECTUS, AND IN THE OTHER DOCUMENTS THAT ARE INCORPORATED BY REFERENCE INTO THIS PROSPECTUS OR THE APPLICABLE PROSPECTUS SUPPLEMENT.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus is September 1, 2017.

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We are responsible for the information contained and incorporated by reference in this prospectus, in any accompanying prospectus supplement, and in any related free writing prospectus we prepare or authorize. We have not authorized anyone to give you any other information, and we take no responsibility for any other information that others may give you. If you are in a jurisdiction where offers to sell, or solicitations of offers to purchase, the securities offered by this documentation are unlawful, or if you are a person to whom it is unlawful to direct these types of activities, then the offer presented in this document does not extend to you. The information contained in this document speaks only as of the date of this document, unless the information specifically indicates that another date applies. Our business, financial condition, results of operations and prospectus may have changed since those dates.

ABOUT THIS PROSPECTUS

This prospectus is part of an automatic shelf registration statement on Form S-3 that we filed with the Securities and Exchange Commission (the “SEC”), as a “well-known seasoned issuer” as defined in Rule 405 under the Securities Act of 1933, as amended (the “Securities Act”). By using a shelf registration statement, we and/or selling securityholders may offer and sell, at any time and from time to time, in one or more offerings, any combination of the securities described in this prospectus. As allowed by the SEC rules, this prospectus and any prospectus supplement or other offering materials do not contain all of the information included in the registration statement. For further information, we refer you to the registration statement, including its exhibits. Statements contained in this prospectus and any prospectus supplement or other offering materials about the provisions or contents of any agreement or other document are not necessarily complete. If the SEC’s rules and regulations require that an agreement or document be filed as an exhibit to the registration statement, please see that agreement or document for a complete description of these matters.

This prospectus provides you with a general description of the securities that we and/or selling securityholders may offer. Each time we and/or selling securityholders sell securities, we will provide a prospectus supplement that contains specific information about the terms of that offering, including the specific amounts, prices and terms of the securities offered. The prospectus supplement may also add information to this prospectus or update or change information in this prospectus. To the extent that this prospectus is used by any securityholder to resell any securities, information with respect to the securityholder and the terms of the securities being offered will be contained in a prospectus supplement. You should read this prospectus and any prospectus supplement together with any additional information you may need to make your investment decision. You should also read and carefully consider the information in the documents we have referred you to in “Where You Can Find More Information” and “Incorporation by Reference” below. Information incorporated by reference after the date of this prospectus is considered a part of this prospectus and may add, update or change information contained in this prospectus. Any information in such subsequent filings that is inconsistent with this prospectus will supersede the information in this prospectus or any earlier prospectus supplement. You should rely only on the information incorporated by reference or provided in this prospectus and any supplement. We have not authorized anyone else to provide you with other information.

You should not assume that the information in this prospectus, any prospectus supplement or any other offering materials is accurate as of any date other than the date on the front of each document. Our business, financial condition, results of operations and prospects may have changed since then.

When used in this prospectus, the terms “Intrexon,” “the Company,” “we,” “our” and “us” refer to Intrexon Corporation and its subsidiaries, unless otherwise specified or the context otherwise requires. Intrexon® is our registered trademark in the United States. This prospectus and the information incorporated herein by reference contain references to trademarks, service marks and trade names owned by us or other companies. Solely for convenience, trademarks, service marks and trade names referred to in this prospectus and the information incorporated herein, including logos, artwork, and other visual displays, may appear without the ® or ™ symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or the rights of the applicable licensor to these trademarks, service marks and trade names. We do not intend our use or display of other companies’ trade names, service marks or trademarks to imply a relationship with, or endorsement or sponsorship of us by, any other companies. Other trademarks, trade names and service marks appearing in this prospectus and any accompanying prospectus supplement or any related free writing prospectus are the property of their respective owners.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. You can inspect and copy these reports, proxy statements and other information at the public reference facilities of the SEC at the SEC's Public Reference Room located at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the Public Reference Room. The SEC also maintains an internet web site that contains reports, proxy and information statements and other information regarding registrants that file electronically with the SEC (www.sec.gov). Our internet address is www.dna.com. However, the information contained on, or that can be accessed through, our website is not a part of this prospectus. We have included our website address in this prospectus solely as an inactive textual reference. In addition, you can inspect reports and other information we file at the office of the New York Stock Exchange, Inc., 20 Broad Street, New York, New York 10005.

We have the authority to designate and issue more than one class or series of stock having various preferences, conversion and other rights, voting powers, restrictions, limitations as to dividends, qualifications, and terms and conditions of redemption. See "Description of Capital Stock — Preferred Stock." We will furnish a full statement of the relative rights and preferences of each class or series of our stock which has been so designated and any restrictions on the ownership or transfer of our stock to any shareholder upon request and without charge. Written requests for such copies should be directed to 20374 Seneca Meadows Parkway, Germantown, Maryland 20876, Attention: Chief Legal Officer, or by telephone request to (301) 556-9900.

We have filed a registration statement and related exhibits with the SEC under the Securities Act. The registration statement contains additional information about us and the securities we may issue. You may inspect the registration statement and exhibits without charge at the office of the SEC at 100 F Street, N.E., Washington, D.C. 20549, and you may obtain copies from the SEC at prescribed rates.

INCORPORATION BY REFERENCE

The SEC allows us to "incorporate by reference" information and reports we file with the SEC into this prospectus, which means that we can disclose important information to you by referring to those documents. We hereby "incorporate by reference" the documents listed below, which means that we are disclosing important information to you by referring you to those documents. The information that we file later with the SEC will automatically update and in some cases supersede this information (other than portions of these documents that are either (1) described in paragraph (e) of Item 201 of Registration S-K or paragraphs (d)(1)-(3) and (e)(5) of Item 407 of Regulation S-K promulgated by the SEC or (2) furnished under Item 2.02 or Item 7.01 of a Current Report on Form 8-K). Specifically, we incorporate by reference the following documents or information filed with the SEC (other than, in each case, documents or information deemed to have been furnished and not filed in accordance with SEC rules, unless otherwise indicated):

- Our Annual Report on Form 10-K for the year ended December 31, 2016, filed on March 1, 2017;
- Our Quarterly Reports on Form 10-Q for the quarters ended March 31, 2017 and June 30, 2017, filed on May 10, 2017 and August 9, 2017, respectively;
- Our Current Reports on Form 8-K filed on March 10, 2017 (other than matters furnished under Item 7.01), March 31, 2017, April 27, 2017 and June 30, 2017;
- The description of our common stock, no par value, contained in our Form 8-A filed on August 5, 2013, including any amendment or report filed for the purpose of updating such description; and
- Future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act") on or after the date of this prospectus, until we have sold all of the offered securities to which this prospectus relates or the offering is otherwise terminated.

You may request a copy of these filings at no cost by writing or telephoning us at the following address:

Corporate Secretary
Intrexon Corporation
20374 Seneca Meadows Parkway
Germantown, Maryland 20876
(301) 556-9900

This prospectus is part of a registration statement we filed with the SEC. We have incorporated exhibits into this registration statement. You should read the exhibits carefully for provisions that may be important to you.

Neither we nor any selling securityholder have authorized anyone to provide you with information other than what is incorporated by reference or provided in this prospectus, any prospectus supplement or any free writing prospectus. Neither we nor any selling securityholder are making an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus or in the documents incorporated by reference is accurate as of any date other than the date on the front of this prospectus or those documents.

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, the documents incorporated by reference into this prospectus and our future oral and written statements, may contain “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995 concerning our business, consolidated financial condition and results of operations. All statements other than statements of historical facts included or incorporated by reference into this prospectus regarding our strategies, prospects, financial condition, costs, plans and objectives are forward-looking statements. The SEC encourages companies to disclose forward-looking statements so that investors can better understand a company’s future prospects and make informed investment decisions. These forward-looking statements reflect our beliefs and expectations as to future events and trends affecting our business, our consolidated financial condition and results of operations. These forward-looking statements are based upon our current expectations concerning future events and discuss, among other things, anticipated future financial performance and future business plans. Forward-looking statements are necessarily subject to risks and uncertainties, many of which are outside our control, that could cause actual results to differ materially from these statements. Forward-looking statements can be identified by such words as “anticipates,” “believes,” “plan,” “assumes,” “could,” “should,” “estimates,” “expects,” “intends,” “potential,” “seek,” “predict,” “may,” “will” and similar expressions.

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;
- the result of litigation proceedings that we face currently or may face in the future;
- 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.

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. Item 1A, “Risk Factors” in our Annual Report on Form 10-K, and Item 1A, “Risk Factors” in our Quarterly Reports on Form 10-Q, which are incorporated by reference into this prospectus, includes 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. 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 prospectus.

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.

OVERVIEW

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 are 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.

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 exclusive channel collaborations, or ECCs. An ECC is an agreement with a collaborator to develop products based on 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, or JV, with a third party collaborator whereby we may contribute access to our technology, cash or both into the JV which we will jointly control with our collaborator. Pursuant to a JV agreement, we may be required to contribute additional capital to the JV, 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 us. 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 are 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 provide Harvest with exclusive rights of first-look and first negotiation. For any opportunities it decides to pursue, Harvest establishes new collaboration entities which enter into an ECC with us in a designated field. The terms of such ECCs are 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 are presented at our discretion on a non-exclusive basis. The agreement with Harvest does not limit our ability to execute other collaborations and JVs 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.

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.

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, we pursue technologies that we believe will be 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.

We have and may continue to engage in a variety of transactions, including ECCs and JVs, with companies in which Randal J. Kirk, our Chairman of the Board and Chief Executive Officer, and affiliates of Mr. Kirk, have a direct or indirect interest. For example, we are party to a services agreement with Third Security, under which Third Security provides certain services to us in return for a monthly fee of shares of our common stock. Mr. Kirk serves as the Senior Managing Director and Chief Executive Officer of Third Security and owns 100 percent of the equity interests of Third Security. 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 ECCs with certain companies, 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. We will continue 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.

We were founded by Thomas D. Reed, Ph.D., in 1998, as an Ohio limited liability company under the name Genomatix LTD. We were reincorporated as a Virginia corporation in 2004 and changed our name to Intrexon Corporation in 2005. The principal executive offices of Intrexon are located at 20374 Seneca Meadows Parkway, Germantown, Maryland 20876, and our telephone number is (301) 556-9900. Our website is www.dna.com. The information on, or that can be accessed through, our website does not constitute part of this prospectus, and you should not rely on any such information in making the decision whether to purchase our common stock. Our common stock is traded on the NYSE under the symbol "XON."

For more information regarding our business, see Item 1 of our Annual Report on Form 10-K for the year ended December 31, 2016, and the other documents incorporated by reference into this prospectus. For information on how you can view our Annual Report on Form 10-K for the year ended December 31, 2016, and other documents incorporated by reference into this prospectus, see the section entitled "Where You Can Find More Information."

RISK FACTORS

Investing in our securities involves a high degree of risk. You should carefully consider the risks described in the documents incorporated by reference in this prospectus and any prospectus supplement, as well as other information we include or incorporate by reference into this prospectus and any applicable prospectus supplement, before making an investment decision. Our business, financial condition or results of operations could be materially adversely affected by the materialization of any of these risks. The trading price of our securities could decline due to the materialization of any of these risks, and you may lose all or part of your investment. This prospectus and the documents incorporated herein by reference also contain forward-looking statements that involve risks and uncertainties. Actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including the risks described in the documents incorporated herein by reference, including (i) our most recent annual report on Form 10-K which is on file with the SEC and is incorporated herein by reference, (ii) our most recent quarterly report on Form 10-Q, which is on file with the SEC and is incorporated by reference into this prospectus, and (iii) other documents we file with the SEC that are deemed incorporated by reference into this prospectus. These risk factors may be amended, supplemented or superseded from time to time by risk factors contained in other Exchange Act reports that we file with the SEC, which will be subsequently incorporated herein by reference; by any prospectus supplement accompanying this prospectus; or by a post-effective amendment to the registration statement of which this prospectus forms a part. In addition, new risks may emerge at any time and we cannot predict such risks or estimate the extent to which they may affect our financial performance. For more information, see “Where You Can Find More Information,” “Incorporation By Reference” and “Cautionary Statement Regarding Forward-Looking Statements.”

RATIO OF EARNINGS TO FIXED CHARGES AND RATIO OF EARNINGS TO COMBINED FIXED CHARGES AND PREFERRED STOCK DIVIDENDS

The following table sets forth our historical ratio of earnings to fixed charges and ratio of earnings to combined fixed charges and preferred stock dividends for each of the periods indicated. You should read this table in conjunction with our consolidated financial statements and related notes and Management’s Discussion and Analysis of Financial Condition and Results of Operations, which are incorporated by reference in this prospectus. For further information, see Exhibit 12.1 (Computation of Ratio of Earnings to Fixed Charges and Ratio of Earnings to Combined Fixed Charges and Preferred Stock Dividends) to the registration statement of which this prospectus forms a part.

	<u>Six Months Ended</u> <u>June 30, 2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>	<u>2013</u>	<u>2012</u>
Ratio of earnings (loss) to fixed charges	—	—	—	—	—	—
Ratio of earnings (loss) to combined fixed charges and preferred stock dividends ⁽²⁾	—	—	—	—	—	—

The historical ratios were prepared on a consolidated basis using amounts calculated in accordance with U.S. generally accepted accounting principles, or U.S. GAAP, and, therefore, reflect all consolidated earnings, fixed charges and preferred stock dividends. For purposes of calculating the ratios for the six months ended June 30, 2017 and years ended December 31, 2016, 2015, 2014, 2013 and 2012 above, earnings consist of pre-tax loss from continuing operations before adjustment for loss from equity method investment plus fixed charges. Fixed charges for the six months ended June 30, 2017 and years ended December 31, 2016, 2015, 2014, 2013 and 2012 include interest expense and an estimate of interest expense within rental expense. Preferred stock dividends for the years ended December 31, 2013 and 2012 include the accretion of dividends on our redeemable convertible preferred stock outstanding during those periods. All outstanding shares of redeemable convertible preferred stock along with cumulative dividends that existed prior to our initial public offering in August 2013 were converted into shares of common stock in connection with our initial public offering. As of the date hereof, no shares of preferred stock are outstanding.

We did not record earnings for the six months ended June 30, 2017 and the years ended December 31, 2016, 2015, 2014, 2013 and 2012. Accordingly, during those periods our earnings were insufficient to cover fixed charges in such periods and we are unable to disclose a ratio of earnings to fixed charges for such periods. Due to our losses for the six months ended June 30, 2017 and the years ended December 31, 2016, 2015, 2014, 2013 and 2012, the ratio coverage was less than 1:1. For the six months ended June 30, 2017 and the years ended December 31, 2016, 2015, 2014, 2013 and 2012, we would have needed to generate additional earnings of \$45.1 million, \$173.0 million, \$78.0 million, \$80.5 million, \$40.3 million and \$81.6 million, respectively, to achieve an earnings to fixed charges coverage ratio of 1:1.

During the six months ended June 30, 2017 and the years ended December 31, 2016, 2015, 2014, 2013 and 2012, our earnings were insufficient to cover fixed charges and preferred stock dividends in such periods and we are unable to disclose a ratio of earnings to combined fixed charges and preferred stock dividends for such periods. Due to our losses for the six months ended June 30, 2017 and the years ended December 31, 2016, 2015, 2014, 2013 and 2012, the ratio coverage was less than 1:1. For the six months ended June 30, 2017 and the years ended December 31, 2016, 2015, 2014, 2013 and 2012, we would have needed to generate additional earnings of \$45.1 million, \$173.0 million, \$78.0 million, \$80.5 million, \$58.7 million and \$103.6 million, respectively, to achieve an earnings to combined fixed charges and preferred stock dividends coverage ratio of 1:1. We had no preferred stock outstanding during the six months ended June 30, 2017 and the years ended December 31, 2016, 2015 and 2014.

USE OF PROCEEDS

The securities that may, from time to time, be listed under this prospectus may be sold by us or by selling securityholders

Unless we state otherwise in the accompanying prospectus supplement, we intend to use the net proceeds from the sale of the securities offered by us pursuant to this prospectus for general corporate purposes. General corporate purposes may include additions to working capital, financing of capital expenditures, repayment or redemption of existing indebtedness, and future acquisitions and strategic investment opportunities. We have not determined the amount of net proceeds to be used specifically for such purposes. As a result, management will retain broad discretion over the allocation of net proceeds. Additional information on the use of net proceeds from any sale of securities offered under this prospectus may be set forth in the prospectus supplement or in any related free writing prospectus relating to a specific offering. Pending the application of net proceeds, we expect to invest the net proceeds in investment grade, interest-bearing securities. From time to time, we may engage in additional public or private financings of a character and amount which we may deem appropriate.

We may file prospectus supplements allowing selling securityholders to sell securities received from us in connection with acquisition transactions, private offerings or other transactions. Unless otherwise set forth in a prospectus supplement, we will not receive any proceeds from sales by selling securityholders.

DESCRIPTION OF DEBT SECURITIES

We may offer debt securities which may be senior or subordinated. We refer to the senior debt securities and the subordinated debt securities collectively as debt securities. The following description summarizes the general terms and provisions of the debt securities. We will describe the specific terms of the debt securities and the extent, if any, to which the general provisions summarized below apply to any series of debt securities in the prospectus supplement relating to the series and any applicable free writing prospectus that we authorize to be delivered. When we refer to “the Company,” “we,” “our,” and “us” in this section, we mean Intrexon Corporation, a Virginia corporation, excluding, unless the context otherwise requires or as otherwise expressly stated, our subsidiaries.

We may issue senior debt securities from time to time, in one or more series under a senior indenture to be entered into between us and a senior trustee to be named in a prospectus supplement, which we refer to as the senior trustee. We may issue subordinated debt securities from time to time, in one or more series under a subordinated indenture to be entered into between us and a subordinated trustee to be named in a prospectus supplement, which we refer to as the subordinated trustee. The forms of senior indenture and subordinated indenture are filed as exhibits to the registration statement of which this prospectus forms a part. Together, the senior indenture and the subordinated indenture are referred to as the indentures and, together, the senior trustee and the subordinated trustee are referred to as the trustees. This prospectus briefly outlines some of the provisions of the indentures. The following summary of the material provisions of the indentures is qualified in its entirety by the provisions of the indentures, including definitions of certain terms used in the indentures. Wherever we refer to particular sections or defined terms of the indentures, those sections or defined terms are incorporated by reference in this prospectus or the applicable prospectus supplement. You should review the indentures that are filed as exhibits to the registration statement of which this prospectus forms a part for additional information.

None of the indentures will limit the amount of debt securities that we may issue. The applicable indenture will provide that debt securities may be issued up to an aggregate principal amount authorized from time to time by us and may be payable in any currency or currency unit designated by us or in amounts determined by reference to an index.

General

The senior debt securities will constitute our unsecured and unsubordinated general obligations and will rank *pari passu* with our other unsecured and unsubordinated obligations. The subordinated debt securities will constitute our unsecured and subordinated general obligations and will be junior in right of payment to our senior indebtedness (including senior debt securities), as described under the heading “—Certain Terms of the Subordinated Debt Securities—Subordination.”

The debt securities will be our unsecured obligations. Any secured debt or other secured obligations will be effectively senior to the debt securities of any series to the extent of the value of the assets securing such debt or other obligations.

The applicable prospectus supplement and/or free writing prospectus will include any additional or different terms of the debt securities being offered, including the following terms:

- the title and type of the debt securities;
- whether the debt securities will be senior or subordinated debt securities, and, with respect to debt securities issued under the subordinated indenture, the terms on which they are subordinated;
- the aggregate principal amount of the debt securities;
- the price or prices at which we will sell the debt securities;
- the maturity date or dates of the debt securities and the right, if any, to extend such date or dates;

- the rate or rates, if any, per year, at which the debt securities will bear interest, or the method of determining such rate or rates;
- the date or dates from which such interest will accrue, the interest payment dates on which such interest will be payable or the manner of determination of such interest payment dates and the related record dates;
- the right, if any, to extend the interest payment periods and the duration of that extension;
- the manner of paying principal and interest and the place or places where principal and interest will be payable;
- provisions for a sinking fund, purchase fund or other analogous fund, if any;
- any redemption dates, prices, obligations and restrictions on the debt securities;
- the currency, currencies or currency units in which the debt securities will be denominated and the currency, currencies or currency units in which principal and interest, if any, on the debt securities may be payable;
- any conversion or exchange features of the debt securities;
- whether and upon what terms the debt securities may be defeased;
- any events of default or covenants in addition to or in lieu of those set forth in the indenture;
- whether the debt securities will be issued in definitive or global form or in definitive form only upon satisfaction of certain conditions;
- whether the debt securities will be guaranteed as to payment or performance;
- any special tax implications of the debt securities; and
- any other material terms of the debt securities.

When we refer to “principal” in this section with reference to the debt securities, we are also referring to “premium, if any.”

We may from time to time, without notice to or the consent of the holders of any series of debt securities, create and issue further debt securities of any such series ranking equally with the debt securities of such series in all respects (or in all respects other than (1) the payment of interest accruing prior to the issue date of such further debt securities or (2) the first payment of interest following the issue date of such further debt securities). Such further debt securities may be consolidated and form a single series with the debt securities of such series and have the same terms as to status, redemption or otherwise as the debt securities of such series.

A holder may present debt securities for exchange and may present debt securities for transfer in the manner, at the places and subject to the restrictions set forth in the debt securities and the applicable prospectus supplement. We will provide those services to the holders without charge, although the holder may have to pay any tax or other governmental charge payable in connection with any exchange or transfer, as set forth in the indenture.

Debt securities may bear interest at a fixed rate or a floating rate. Debt securities bearing no interest or interest at a rate that at the time of issuance is below the prevailing market rate (original issue discount securities) may be sold at a discount below their stated principal amount. U.S. federal income tax considerations applicable to any such discounted debt securities or to certain debt securities issued at par that are treated as having been issued at a discount for U.S. federal income tax purposes will be described in the applicable prospectus supplement.

We may issue debt securities with the principal amount payable on any principal payment date, or the amount of interest payable on any interest payment date, to be determined by reference to one or more currency exchange rates, securities or baskets of securities, commodity prices or indices. The holder may receive a payment of principal on any principal payment date, or a payment of interest on any interest payment date, that is greater than or less than the amount of principal or interest otherwise payable on such dates, depending on the value on such dates of the applicable currency, security or basket of securities, commodity or index. Information as to the methods for determining the amount of principal or interest payable on any date, the currencies, securities or baskets of securities, commodities or indices to which the amount payable on such date is linked and certain related tax considerations will be set forth in the applicable prospectus supplement.

Certain Terms of the Senior Debt Securities

Covenants. Unless we indicate otherwise in a prospectus supplement, the senior debt securities will not contain any financial or restrictive covenants, including covenants restricting either us or any of our subsidiaries from incurring, issuing, assuming or guaranteeing any indebtedness secured by a lien on any of our or our subsidiaries' property or capital stock, or restricting either us or any of our subsidiaries from entering into sale and leaseback transactions.

Consolidation, Merger and Sale of Assets. Unless we indicate otherwise in a prospectus supplement, we may not consolidate with or merge into any other person in a transaction in which we are not the surviving corporation, or convey, transfer or lease our properties and assets substantially as an entirety to any person, in either case, unless:

- the successor entity, if any, is a U.S. corporation, limited liability company, partnership or trust (subject to certain exceptions provided for in the senior indenture);
- the successor entity assumes our obligations on the senior debt securities and under the senior indenture;
- immediately after giving effect to the transaction, no default or event of default shall have occurred and be continuing; and
- certain other conditions are met.

No Protection in the Event of a Change in Control. Unless we indicate otherwise in a prospectus supplement with respect to a particular series of senior debt securities, the senior debt securities will not contain any provisions that may afford holders of the senior debt securities protection in the event we have a change in control or in the event of a highly leveraged transaction (whether or not such transaction results in a change in control).

Events of Default. The following are events of default under the senior indenture for any series of senior debt securities:

- failure to pay interest on any senior debt securities of such series when due and payable, if that default continues for a period of 90 days (or such other period as may be specified for such series);
- failure to pay principal on the senior debt securities of such series when due and payable whether at maturity, upon redemption, by declaration or otherwise (and, if specified for such series, the continuance of such failure for a specified period);
- default in the performance of or breach of any of our covenants or agreements in the senior indenture applicable to senior debt securities of such series, other than a covenant breach which is specifically dealt with elsewhere in the senior indenture, and that default or breach continues for a period of 90 days after we receive written notice from the trustee or from the holders of 25% or more in aggregate principal amount of the senior debt securities of such series;

- certain events of bankruptcy or insolvency, whether or not voluntary; and
- any other event of default provided for in such series of senior debt securities as may be specified in the applicable prospectus supplement.

The default by us under any other debt, including any other series of debt securities, is not a default under the senior indenture.

If an event of default other than an event of default specified in the fourth bullet point immediately above occurs with respect to a series of senior debt securities and is continuing under the senior indenture, then, and in each such case, either the trustee or the holders of not less than 25% in aggregate principal amount of such series then outstanding under the senior indenture (each such series voting as a separate class) by written notice to us and to the trustee, if such notice is given by the holders, may, and the trustee at the request of such holders shall, declare the principal amount of and accrued interest on such series of senior debt securities to be immediately due and payable, and upon this declaration, the same shall become immediately due and payable.

If an event of default specified in the fourth bullet point immediately above occurs and is continuing, the entire principal amount of and accrued interest on each series of senior debt securities then outstanding shall become immediately due and payable.

Unless otherwise specified in the prospectus supplement relating to a series of senior debt securities originally issued at a discount, the amount due upon acceleration shall include only the original issue price of the senior debt securities, the amount of original issue discount accrued to the date of acceleration and accrued interest, if any.

Upon certain conditions, declarations of acceleration may be rescinded and annulled and past defaults may be waived by the holders of a majority in aggregate principal amount of all the senior debt securities of such series affected by the default, each series voting as a separate class. Furthermore, prior to a declaration of acceleration and subject to various provisions in the senior indenture, the holders of a majority in aggregate principal amount of a series of senior debt securities, by notice to the trustee, may waive an existing default or event of default with respect to such senior debt securities and its consequences, except a default in the payment of principal of or interest on such senior debt securities or in respect of a covenant or provision of the senior indenture which cannot be modified or amended without the consent of the holders of each such senior debt security. Upon any such waiver, such default shall cease to exist, and any event of default with respect to such senior debt securities shall be deemed to have been cured, for every purpose of the senior indenture; but no such waiver shall extend to any subsequent or other default or event of default or impair any right consequent thereto.

The holders of a majority in aggregate principal amount of a series of senior debt securities may direct the time, method and place of conducting any proceeding for any remedy available to the trustee or exercising any trust or power conferred on the trustee with respect to such senior debt securities. However, the trustee may refuse to follow any direction that conflicts with law or the senior indenture, that may involve the trustee in personal liability or that the trustee determines in good faith may be unduly prejudicial to the rights of holders of such series of senior debt securities not joining in the giving of such direction and may take any other action it deems proper that is not inconsistent with any such direction received from holders of such series of senior debt securities. A holder may not pursue any remedy with respect to the senior indenture or any series of senior debt securities unless:

- the holder gives the trustee written notice of a continuing event of default;
- the holders of at least 25% in aggregate principal amount of such series of senior debt securities make a written request to the trustee to pursue the remedy in respect of such event of default;
- the requesting holder or holders offer the trustee indemnity satisfactory to the trustee against any costs, liability or expense;

- the trustee does not comply with the request within 60 days after receipt of the request and the offer of indemnity; and
- during such 60-day period, the holders of a majority in aggregate principal amount of such series of senior debt securities do not give the trustee a direction that is inconsistent with the request.

These limitations, however, do not apply to the right of any holder of a senior debt security to receive payment of the principal of and interest on such senior debt security in accordance with the terms of such debt security, or to bring suit for the enforcement of any such payment in accordance with the terms of such debt security, on or after the due date for the senior debt securities, which right shall not be impaired or affected without the consent of the holder.

The senior indenture requires certain of our officers to certify, on or before a fixed date in each year in which any senior debt security is outstanding, as to their knowledge of our compliance with all covenants, agreements and conditions under the senior indenture.

Satisfaction and Discharge. We can satisfy and discharge our obligations to holders of any series of debt securities if:

- we pay or cause to be paid, as and when due and payable, the principal of and any interest on all senior debt securities of such series outstanding under the senior indenture; or
- all senior debt securities of such series have become due and payable or will become due and payable within one year (or are to be called for redemption within one year) and we deposit in trust a combination of cash and U.S. government or U.S. government agency obligations that will generate enough cash to make interest, principal and any other payments on the debt securities of that series on their various due dates.

Under current U.S. federal income tax law, the deposit and our legal release from the debt securities would be treated as though we took back the debt securities and gave the holder their share of the cash and debt securities or bonds deposited in trust. In that event, the holder could recognize gain or loss on the debt securities such holder gives back to us. Purchasers of the debt securities should consult their own advisers with respect to the tax consequences to them of such deposit and discharge, including the applicability and effect of tax laws other than the U.S. federal income tax law.

Defeasance. Unless the applicable prospectus supplement provides otherwise, the following discussion of legal defeasance and discharge and covenant defeasance will apply to any series of debt securities issued under the indentures.

Legal Defeasance. We can legally release ourselves from any payment or other obligations on the debt securities of any series (called “legal defeasance”) if certain conditions are met, including the following:

- We deposit in trust for the benefit of all direct holders of the debt securities of the same series a combination of cash and U.S. government or U.S. government agency obligations that will generate enough cash to make interest, principal and any other payments on the debt securities of that series on their various due dates.
- There is a change in current U.S. federal income tax law or an IRS ruling that lets us make the above deposit without causing the holder to be taxed on the debt securities any differently than if we did not make the deposit and instead repaid the debt securities ourselves when due. Under current U.S. federal income tax law, the deposit and our legal release from the debt securities would be treated as though we took back the debt securities and gave the holder their share of the cash and debt securities or bonds deposited in trust. In that event, the holder could recognize gain or loss on the debt securities such holder gives back to us.

- We deliver to the trustee a legal opinion of our counsel confirming the tax law change or ruling described above.

If we ever did accomplish legal defeasance, as described above, holders would have to rely solely on the trust deposit for repayment of the debt securities. The holders could not look to us for repayment in the event of any shortfall.

Covenant Defeasance. Without any change of current U.S. federal tax law, we can make the same type of deposit described above and be released from some of the covenants in the debt securities (called “covenant defeasance”). In that event, the holder would lose the protection of those covenants but would gain the protection of having money and securities set aside in trust to repay the debt securities. In order to achieve covenant defeasance, we must do the following (among other things):

- We must deposit in trust for the benefit of all direct holders of the debt securities of the same series a combination of cash and U.S. government or U.S. government agency obligations that will generate enough cash to make interest, principal and any other payments on the debt securities of that series on their various due dates.
- We must deliver to the trustee a legal opinion of our counsel confirming that under current U.S. federal income tax law we may make the above deposit without causing the holders to be taxed on the debt securities any differently than if we did not make the deposit and instead repaid the debt securities ourselves when due.

If we accomplish covenant defeasance, the holders can still look to us for repayment of the debt securities if there were a shortfall in the trust deposit. In fact, if one of the Events of Default occurred (such as our bankruptcy) and the debt securities become immediately due and payable, there may be such a shortfall. Depending on the events causing the default, the holders may not be able to obtain payment of the shortfall.

Modification and Waiver. We and the trustee may amend or supplement the senior indenture or the senior debt securities without the consent of any holder:

- to convey, transfer, assign, mortgage or pledge any assets as security for the senior debt securities of one or more series;
- to evidence the succession of a corporation, limited liability company, partnership or trust to us, and the assumption by such successor of our covenants, agreements and obligations under the senior indenture;
- to add to our covenants such new covenants, restrictions, conditions or provisions for the protection of the holders, and to make the occurrence, or the occurrence and continuance, of a default in any such additional covenants, restrictions, conditions or provisions an event of default;
- to cure any ambiguity, defect or inconsistency in the senior indenture or in any supplemental indenture or to conform the senior indenture or the senior debt securities to the description of senior debt securities of such series set forth in this prospectus or any applicable prospectus supplement;
- to provide for or add guarantors with respect to the senior debt securities of any series;
- to establish the form or forms or terms of the senior debt securities as permitted by the senior indenture;
- to evidence and provide for the acceptance of appointment under the senior indenture by a successor trustee, or to make such changes as shall be necessary to provide for or facilitate the administration of the trusts in the senior indenture by more than one trustee;
- to add to, delete from or revise the conditions, limitations and restrictions on the authorized amount, terms, purposes of issue, authentication and delivery of any series of senior debt securities;

- to make any change to the senior debt securities of any series so long as no senior debt securities of such series are outstanding; or
- to make any change that does not adversely affect the rights of any holder in any material respect.

Other amendments and modifications of the senior indenture or the senior debt securities issued may be made, and our compliance with any provision of the senior indenture with respect to any series of senior debt securities may be waived, with the consent of the holders of a majority of the aggregate principal amount of the outstanding senior debt securities of all series affected by the amendment or modification (voting together as a single class); provided, however, that each affected holder must consent to any modification, amendment or waiver that:

- extends the final maturity of any senior debt securities of such series;
- reduces the principal amount of any senior debt securities of such series;
- reduces the rate or extends the time of payment of interest on any senior debt securities of such series;
- reduces the amount payable upon the redemption of any senior debt securities of such series;
- changes the currency of payment of principal of or interest on any senior debt securities of such series;
- reduces the principal amount of original issue discount securities payable upon acceleration of maturity or the amount provable in bankruptcy;
- waives a default in the payment of principal of or interest on the senior debt securities;
- changes the provisions relating to the waiver of past defaults or changes or impairs the right of holders to receive payment or to institute suit for the enforcement of any payment or conversion of any senior debt securities of such series on or after the due date therefor;
- modifies any of the provisions of these restrictions on amendments and modifications, except to increase any required percentage or to provide that certain other provisions cannot be modified or waived without the consent of the holder of each senior debt security of such series affected by the modification; or
- reduces the above-stated percentage of outstanding senior debt securities of such series whose holders must consent to a supplemental indenture or to modify or amend or to waive certain provisions of or defaults under the senior indenture.

It shall not be necessary for the holders to approve the particular form of any proposed amendment, supplement or waiver, but it shall be sufficient if the holders' consent approves the substance thereof. After an amendment, supplement or waiver of the senior indenture in accordance with the provisions described in this section becomes effective, the trustee must give to the holders affected thereby certain notice briefly describing the amendment, supplement or waiver. Any failure by the trustee to give such notice, or any defect therein, shall not, however, in any way impair or affect the validity of any such amendment, supplemental indenture or waiver.

No Personal Liability of Incorporators, Shareholders, Officers, Directors. The senior indenture provides that no recourse shall be had under any obligation, covenant or agreement of ours in the senior indenture or any supplemental indenture, or in any of the senior debt securities or because of the creation of any indebtedness represented thereby, against any of our incorporators, shareholders, officers or directors, past, present or future, or of any predecessor or successor entity thereof under any law, statute or constitutional provision or by the enforcement of any assessment or by any legal or equitable proceeding or otherwise. Each holder, by accepting the senior debt securities, waives and releases all such liability.

Concerning the Trustee. The senior indenture provides that, except during the continuance of an event of default, the trustee will not be liable except for the performance of such duties as are specifically set forth in the

senior indenture. If an event of default has occurred and is continuing, the trustee will exercise such rights and powers vested in it under the senior indenture and will use the same degree of care and skill in its exercise as a prudent person would exercise under the circumstances in the conduct of such person's own affairs.

The senior indenture and the provisions of the Trust Indenture Act of 1939 incorporated by reference therein contain limitations on the rights of the trustee thereunder, should it become a creditor of ours or any of our subsidiaries, to obtain payment of claims in certain cases or to realize on certain property received by it in respect of any such claims, as security or otherwise. The trustee is permitted to engage in other transactions, provided that if it acquires any conflicting interest (as defined in the Trust Indenture Act), it must eliminate such conflict or resign.

We may have normal banking relationships with the senior trustee in the ordinary course of business.

Unclaimed Funds. All funds deposited with the trustee or any paying agent for the payment of principal, premium, interest or additional amounts in respect of the senior debt securities that remain unclaimed for two years after the date upon which such principal, premium or interest became due and payable will be repaid to us. Thereafter, any right of any holder of senior debt securities to such funds shall be enforceable only against us, and the trustee and paying agents will have no liability therefor.

Governing Law. The senior indenture and the senior debt securities will be governed by, and construed in accordance with, the internal laws of the State of New York.

Certain Terms of the Subordinated Debt Securities

Other than the terms of the subordinated indenture and subordinated debt securities relating to subordination or otherwise as described in the prospectus supplement relating to a particular series of subordinated debt securities, the terms of the subordinated indenture and subordinated debt securities are identical in all material respects to the terms of the senior indenture and senior debt securities.

Additional or different subordination terms may be specified in the prospectus supplement applicable to a particular series.

Subordination. The indebtedness evidenced by the subordinated debt securities is subordinate to the prior payment in full of all of our senior indebtedness, as defined in the subordinated indenture.

During the continuance beyond any applicable grace period of any default in the payment of principal, premium, interest or any other payment due on any of our senior indebtedness, we may not make any payment of principal or interest on the subordinated debt securities (except for certain sinking fund payments). In addition, upon any payment or distribution of our assets upon any dissolution, winding-up, liquidation or reorganization, the payment of the principal or interest on the subordinated debt securities will be subordinated to the extent provided in the subordinated indenture in right of payment to the prior payment in full of all our senior indebtedness. Because of this subordination, if we dissolve or otherwise liquidate, holders of our subordinated debt securities may receive less, ratably, than holders of our senior indebtedness. The subordination provisions do not prevent the occurrence of an event of default under the subordinated indenture.

The term "senior indebtedness" of a person means with respect to such person the principal of, premium, if any, interest on, and any other payment due pursuant to any of the following, whether outstanding on the date of the subordinated indenture or incurred by that person in the future:

- all of the indebtedness of that person for money borrowed;
- all of the indebtedness of that person evidenced by notes, debentures, bonds or other securities sold by that person for money;

- all of the lease obligations that are capitalized on the books of that person in accordance with generally accepted accounting principles;
- all indebtedness of others of the kinds described in the first two bullet points immediately above and all lease obligations of others of the kind described in the third bullet point immediately above that the person, in any manner, assumes or guarantees or that the person in effect guarantees through an agreement to purchase, whether that agreement is contingent or otherwise; and
- all renewals, extensions or refundings of indebtedness of the kinds described in the first, second or fourth bullet points immediately above and all renewals or extensions of leases of the kinds described in the third or fourth bullet points immediately above;

unless, in the case of any particular indebtedness, renewal, extension or refunding, the instrument creating or evidencing it or the assumption or guarantee relating to it expressly provides that such indebtedness, renewal, extension or refunding is not superior in right of payment to the subordinated debt securities. Our senior debt securities constitute senior indebtedness for purposes of the subordinated debt indenture.

DESCRIPTION OF CAPITAL STOCK

The following description summarizes information about our capital stock. This information does not purport to be complete and is subject to, and qualified in its entirety by reference to, the terms of our amended and restated articles of incorporation and amended and restated bylaws, which are included as exhibits to the registration statement of which this prospectus forms a part, and the applicable provisions of Virginia law, the state in which we are incorporated.

As of August 25, 2017, our authorized capital stock consisted of 200,000,000 shares of common stock, no par value per share, and 25,000,000 shares of preferred stock, no par value per share.

As of August 25, 2017, there were 120,519,449 shares of common stock outstanding and held of record by approximately 326 shareholders. 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. All outstanding shares of common stock are fully paid and nonassessable. There are no shares of preferred stock outstanding.

Common Stock

Shares of our common stock have the following rights, preferences and privileges:

Voting rights

Each outstanding share of common stock is entitled to one vote on all matters submitted to a vote of our shareholders, including the election of directors. Holders of our common stock do not have cumulative voting rights in the election of directors, and therefore the holders of a plurality of the shares of common stock voting for the election of directors may elect all of our directors standing for election.

Dividends

Holders of common stock are entitled to receive dividends if and when dividends are declared by our board of directors out of assets legally available for the payment of dividends, subject to preferential rights of outstanding shares of preferred stock, if any.

Liquidation

In the event of a liquidation, dissolution or winding up of the affairs of our Company, whether voluntary or involuntary, after payment of our debts and other liabilities and making provision for the holders of outstanding shares of preferred stock, if any, we will distribute the remainder of our assets ratably among the holders of shares of common stock.

Rights and preferences

The common stock has no preemptive, redemption, conversion or subscription rights. The rights, powers, preferences and privileges of holders of common stock are subject to, and may be impaired by, the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Stock options

As of August 25, 2017, options to purchase 12,662,918 shares of our common stock were outstanding, of which options to purchase 4,950,372 shares of our common stock were exercisable.

Warrants

As of August 25, 2017, we had outstanding warrants to purchase shares of our common stock that will be exercisable for an aggregate of 133,264 shares of our common stock. Each of these warrants was and remains exercisable in full.

Registration Rights

We have entered into an investors' rights agreement with certain of our shareholders who will have the right to require us to register their shares under the Securities Act under specified circumstances and will have incidental registration rights as described below. After registration pursuant to these rights, these shares will become freely tradable without restriction under the Securities Act.

Demand registration rights

Certain holders, or Demand Holders, have demand registration rights. Beginning on February 4, 2014, subject to specified limitations set forth in the investor rights agreement, at any time the Demand Holders who are holders of at least 75 percent of the then-outstanding registrable securities, as defined in the investor rights agreement, of all Demand Holders as a class, acting together, may demand in writing that we register their registrable securities under the Securities Act. We are not obligated to file a registration statement pursuant to this demand provision on more than two occasions, subject to specified exceptions.

In addition, subject to specified limitations, the holders of registrable securities may demand in writing that we register on Form S-3 the registrable securities held by them so long as the total amount of registrable securities being registered has an aggregate offering price of at least \$500,000. We are not obligated to file a Form S-3 pursuant to this provision within 12 months of the effective date of any other Form S-3 registration statement that we may file.

In addition, certain holders who entered into securities purchase agreements with us on March 26, 2014, or March 2014 Investors, have demand registration rights. Any March 2014 Investor who purchased at least \$10.0 million of our common stock in the March 2014 private placement has the right to require us to register such shares of our common stock on a registration statement on Form S-3, if available for use.

Incidental registration rights

If we propose to file a registration statement to register any of our securities under the Securities Act for our own account, other than pursuant to a Form S-4 or Form S-8, the holders of our registrable securities are entitled to notice of registration and, subject to specified exceptions, we will be required to register the registrable securities then held by them that they request that we register. The holders of these registrable securities may be deemed to have such rights with respect to offerings under any prospectus supplement.

Expenses

Pursuant to the investor rights agreement, we are required to pay all registration expenses, including all registration, filing and qualification fees, printers' and accounting fees, fees and expenses incurred in connection with complying with state securities or "blue sky" laws, fees and expenses of listing registrable securities on any securities exchange on which shares of our common stock are then listed, fees and disbursements of our counsel, but excluding any underwriting discounts and commissions, related to any demand or incidental registration. The investor rights agreement contains customary cross-indemnification provisions, pursuant to which we are obligated to indemnify the selling shareholders in the event of material misstatements or omissions in the registration statement attributable to us, and they are obligated to indemnify us for material misstatements or omissions in the registration statement attributable to them.

Preferred Stock

As of August 25, 2017, we have no shares of preferred stock issued or outstanding. Our amended and restated articles of incorporation authorize our board to designate and issue from time to time one or more series of preferred stock without shareholder approval. Our board may fix and determine the preferences, limitations and relative rights of each series of preferred stock issued. Because our board has the power to establish the preferences and rights of each series of preferred stock, it may afford the holders of any series of preferred stock preferences and rights, voting or otherwise, senior to the rights of holders of our common stock. It is not possible to state the actual effect of the issuance of any shares of preferred stock upon the rights of holders of common stock until our board determines the specific rights of the holders of preferred stock. However, the effects might include:

- restricting dividends on our common stock;
- diluting the voting power of our common stock;
- impairing liquidation rights of our common stock; or
- delaying or preventing a change in control of us without further action by our shareholders.

We have no present plans to issue any shares of preferred stock.

Anti-takeover Effects of Provisions of our Charter and Bylaws and of Virginia Law

Our amended and restated articles of incorporation, bylaws and Virginia law contain provisions that may have the effect of impeding the acquisition of control of us by means of a tender offer, a proxy contest, open market purchases or otherwise in a transaction not approved by our board of directors. These provisions are designed to reduce, or have the effect of reducing, our vulnerability to coercive takeover practices and inadequate takeover bids. The existence of these provisions could limit the price that investors might otherwise pay in the future for shares of common stock. In addition, these provisions make it more difficult for our shareholders to remove our board of directors or management, should they choose to do so.

Articles of Incorporation and Bylaws

Preferred stock

Our amended and restated articles of incorporation authorize our board to establish one or more series of preferred stock and to determine, with respect to any series of preferred stock, the preferences, rights and other terms of such series. See “Preferred stock” above for additional information. Under this authority, our board could create and issue a series of preferred stock with rights, preferences or restrictions that have the effect of discriminating against an existing or prospective holder of our capital stock as a result of such holder beneficially owning or commencing a tender offer for a substantial amount of our common stock. One of the effects of authorized but unissued and unreserved shares of preferred stock may be to render it more difficult for, or to discourage an attempt by, a potential acquiror to obtain control of us by means of a merger, tender offer, proxy contest or otherwise, and thereby protect the continuity of our management. The issuance of shares of preferred stock may have the effect of delaying, deferring or preventing a change in control of our Company without any action by our shareholders.

Qualification and election of directors

Our bylaws provide that to be eligible to be a nominee for election to our board of directors, a person must submit a written questionnaire regarding his or her background and qualifications and must agree to other representations as set forth in our bylaws. In addition, we have adopted a director resignation policy. Our bylaws provide that, in uncontested director elections (i.e., an election where the number of nominees is not greater than the number of directors to be elected), a nominee for director will be elected to the board of directors if the votes

cast for such nominee's election exceed the votes cast against such nominee's election. However, directors will be elected by a plurality of the votes cast at any meeting of the shareholders for which (i) the Secretary receives a notice that a shareholder has nominated a person for election to the board of directors in compliance with the advance notice requirements for shareholder nominees for director set forth in the bylaws, and (ii) such nomination has not been withdrawn by such shareholder on or prior to the 10th day preceding the date we first mail the notice of meeting for such meeting to the shareholders (i.e., if there is a contested director election). If directors are to be elected by a plurality of the votes cast, the shareholders may withhold votes, but will not be permitted to vote against a nominee. Our Corporate Governance Guidelines provide that any nominee for director in an uncontested election who receives a greater number of shareholder votes cast "against" his or her election than votes "for" his or her election must promptly tender his or her resignation to the board of directors for consideration. The Nominating and Governance Committee will then evaluate the best interests of the company and will recommend to the board of directors whether to accept or reject the tendered resignation. Following the board of directors' receipt of this recommendation and determination as to whether to accept the resignation, we will disclose the board of directors' decision and an explanation of how the decision was reached.

Board vacancies; removal

Our amended and restated articles of incorporation provide that any vacancy occurring on our board of directors may be filled by a majority of directors then in office, even if less than a quorum.

Special meetings of shareholders

Our bylaws provide that a special meeting may be called by a vote of 25 percent of shareholders, and that shareholders may only conduct business at special meetings of shareholders that was specified in the notice of the meeting.

Advance notification of shareholder nominations and proposals

Our bylaws establish advance notice procedures with respect to shareholder proposals and the nomination of persons for election as directors, other than nominations made by or at the direction of our board.

Exclusive forum provision

Our bylaws provide that unless we consent in writing to the selection of an alternative forum, the United States District Court for the Eastern District of Virginia, Alexandria Division, or in the event that court lacks subject matter jurisdiction to hear such action, the Circuit Court of the County of Fairfax, Virginia, will be the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action for breach of duty to the Company or our shareholders by any current or former officer or other employee or agent or director of the Company, (iii) any action against the Company or any current or former officer or other employee or agent or director of the Company arising pursuant to any provision of the Virginia Stock Corporation Act (as it may be amended from time to time) or our articles of incorporation or our bylaws (as either may be amended from time to time), or (iv) any action against the Company or any current or former officer or other employee or agent or director of the Company governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring or holding any interest in shares of our capital stock shall be deemed to have notice of and consented to the forum provisions in our amended and restated bylaws. It is possible that a court of law could rule that the choice of forum provision contained in our bylaws is inapplicable or unenforceable if it is challenged in a proceeding or otherwise.

Virginia Anti-takeover Statutes

Affiliated transactions statute

Virginia law contains provisions governing affiliated transactions. In general, these provisions prohibit a Virginia corporation from engaging in affiliated transactions with any holder of more than 10 percent of any

class of its outstanding voting shares, or an interested shareholder, for a period of three years following the date that such person became an interested shareholder unless:

- a majority of (but not fewer than two) disinterested directors of the corporation and the holders of two-thirds of the voting shares, other than the shares beneficially owned by the interested shareholder, approve the affiliated transaction; or
- before or on the date the person became an interested shareholder, a majority of disinterested directors approved the transaction that resulted in the shareholder becoming an interested shareholder.

Affiliated transactions subject to this approval requirement include mergers, share exchanges, material dispositions of corporate assets not in the ordinary course of business, any dissolution of the corporation proposed by or on behalf of an interested shareholder or any reclassification, including reverse stock splits, recapitalizations or mergers of the corporation with its subsidiaries, which increases the percentage of voting shares owned beneficially by an interested shareholder by more than five percent.

Virginia law permits a corporation to exempt itself from this statutory provision by placing a statement to that effect in its articles of incorporation. Our amended and restated articles of incorporation do not specifically address the Virginia statute regarding affiliated transactions; therefore, we are subject to this provision.

Control share acquisitions statute

Virginia law also contains provisions relating to control share acquisitions, which are transactions causing the voting strength of any person acquiring beneficial ownership of shares of a Virginia public corporation to meet or exceed certain threshold percentages (20 percent, 33 1/3 percent or 50 percent) of the total votes entitled to be cast for the election of directors. Shares acquired in a control share acquisition have no voting rights unless:

- the voting rights are granted by a majority vote of all outstanding shares entitled to vote in the election of directors, other than those held by the acquiring person or any officer or employee director of the corporation; or
- the articles of incorporation or bylaws of the corporation provide that these Virginia law provisions do not apply to acquisitions of its shares.

The acquiring person may require that a special meeting of the shareholders be held within 50 days of the corporation's receipt of the acquiring person's request to consider the grant of voting rights to the shares acquired in the control share acquisition. If voting rights are not granted and the corporation's articles of incorporation or bylaws permit, the acquiring person's shares may be repurchased by the corporation, at its option, at a price per share equal to the acquiring person's cost. Virginia law grants dissenters' rights to any shareholder who objects to a control share acquisition that is approved by a vote of disinterested shareholders and that gives the acquiring person control of a majority of the corporation's voting shares.

Our amended and restated articles of incorporation provide that this second statutory provision does not apply to our Company; therefore, we are not subject to this provision.

Indemnification and Limitation of Directors' and Officers' Liability

The Virginia Stock Corporation Act and our amended and restated articles of incorporation provide for indemnification of our directors and officers in a variety of circumstances, which may include liabilities under the Securities Act. Virginia law provides that, unless limited by its articles of incorporation, a corporation must indemnify a director or officer who entirely prevails in the defense of any proceeding to which he was a party because he is or was a director or officer of the corporation against reasonable expenses incurred by him in connection with the proceeding. Virginia law permits a corporation to indemnify, after a determination has been made that indemnification of the director is permissible in the circumstances because he has met the following

standard of conduct, an individual made a party to a proceeding because he is or was a director against liability incurred in the proceeding if:

- he conducted himself in good faith;
- he believed in the case of conduct in his official capacity with the corporation, that his conduct was in its best interests and in all other cases that his conduct was at least not opposed to its best interests; and
- in the case of any criminal proceeding, he had no reasonable cause to believe his conduct was unlawful.

A Virginia corporation may not indemnify a director in connection with a proceeding by or in the right of the corporation in which the director was adjudged liable to the corporation or in connection with any other proceeding charging improper personal benefit to him, whether or not involving action in his official capacity, in which he was adjudged liable on the basis that personal benefit was improperly received by him, unless in either case a court orders indemnification and then only for expenses. In addition, the Virginia Stock Corporation Act permits a corporation to advance reasonable expenses to a director or officer upon the corporation's receipt of a written undertaking by the director or on the director's behalf to repay the amount paid or reimbursed by the corporation if it is ultimately determined that the director is not entitled to indemnification and did not meet the relevant standard of conduct.

In addition, Virginia law permits a corporation to make any further indemnity, including indemnity with respect to a proceeding by or in the right of the corporation, and to make additional provision for advances and reimbursement of expenses, to any director or officer that may be authorized by the articles of incorporation or any bylaw made by the shareholders or any resolution adopted by the shareholders, except an indemnity against his willful misconduct or a knowing violation of the criminal law.

In addition, the Virginia Stock Corporation Act permits a Virginia corporation to limit the personal liability of an officer or director in any proceeding brought by or in the name of the corporation or its shareholders, except if the director or officer engaged in willful misconduct or a knowing violation of the criminal law or any federal or state securities laws, including insider trading or market manipulation.

Our amended and restated articles of incorporation require indemnification of directors and officers with respect to certain liabilities, expenses, and other amounts imposed on them by reason of having been a director or officer, except in the case of willful misconduct or a knowing violation of criminal law. Our amended and restated articles of incorporation also limit the liability of our officers and directors to the extent not prohibited by Virginia law. We also carry insurance on behalf of directors, officers, employees or agents which may cover liabilities under the Securities Act.

Listing on the New York Stock Exchange

Our common stock is listed on the New York Stock Exchange under the symbol "XON."

Authorized but Unissued Shares

The authorized but unissued shares of common stock and preferred stock are available for future issuance without shareholder approval, subject to any limitations imposed by the New York Stock Exchange listing rules. These additional shares may be used for a variety of corporate finance transactions, acquisitions and employee benefit plans. The existence of authorized but unissued and unreserved common stock and preferred stock could make it more difficult or discourage an attempt to obtain control of us by means of a proxy contest, tender offer, merger or otherwise.

Transfer Agent and Registrar

The transfer agent and registrar for the common stock is American Stock Transfer & Trust Company, LLC.

DESCRIPTION OF WARRANTS

We may issue warrants to purchase debt securities, preferred stock, common stock or other securities. We may issue warrants independently or together with other securities. Warrants sold with other securities may be attached to or separate from the other securities. We will issue warrants under one or more warrant agreements between us and a warrant agent that we will name in the applicable prospectus supplement. The warrant agent will act solely as our agent in connection with the warrants and will not assume any obligation or relationship of agency or trust for or with any holders or beneficial owners of warrants. Further terms of the warrants and the applicable warrant agreements will be set forth in the applicable prospectus supplement.

The prospectus supplement relating to any warrants we offer will include specific terms relating to the offering. These terms will include some or all of the following:

- the title of the warrants;
- the aggregate number of warrants offered;
- the designation, number and terms of the debt securities, preferred stock, common stock or other securities purchasable upon exercise of the warrants and procedures by which those numbers may be adjusted;
- the exercise price of the warrants;
- the dates or periods during which the warrants are exercisable;
- the designation and terms of any securities with which the warrants are issued;
- if the warrants are issued as a unit with another security, the date on and after which the warrants and the other security will be separately transferable;
- if the exercise price is not payable in United States dollars, the foreign currency, currency unit or composite currency in which the exercise price is denominated;
- any minimum or maximum amount of warrants that may be exercised at any one time;
- any terms relating to the modification of the warrants;
- any terms, procedures and limitations relating to the transferability, exchange or exercise of the warrants; and
- any other specific terms of the warrants.

We and the warrant agent may amend or supplement the warrant agreement for a series of warrants without the consent of the holders of the warrants issued thereunder to effect changes that are not inconsistent with the provisions of the warrants and that do not materially and adversely affect the interests of the holders of the warrants.

The description in the applicable prospectus supplement of any warrants that we may offer will not necessarily be complete and will be qualified in its entirety by reference to the applicable warrant agreement, which will be filed with the SEC.

DESCRIPTION OF RIGHTS

We may issue rights to purchase debt securities, preferred stock, common stock or other securities. These rights may be issued independently or together with any other security offered hereby and may or may not be transferable by the shareholder receiving the rights in such offering. The applicable prospectus supplement may add, update or change the terms and conditions of the rights as described in this prospectus.

The applicable prospectus supplement will describe the specific terms of any offering of rights for which this prospectus is being delivered, including the following:

- the price, if any, per right;
- the exercise price payable for debt securities, preferred stock, common stock, or other securities upon the exercise of the rights;
- the number of rights issued or to be issued to each shareholder;
- the number and terms of debt securities, preferred stock, common stock, or other securities which may be purchased per right;
- the extent to which the rights are transferable;
- any other terms of the rights, including the terms, procedures and limitations relating to the exchange and exercise of the rights;
- the date on which the holder's ability to exercise the rights shall commence, and the date on which the rights shall expire;
- the extent to which the rights may include an over-subscription privilege with respect to unsubscribed securities; and
- if applicable, the material terms of any standby underwriting or purchase arrangement entered into by us in connection with the offering of such rights.

Holders may exercise rights as described in the applicable prospectus supplement. Upon receipt of payment and the rights certificate properly completed and duly executed at the corporate trust office of the rights agent or any other office indicated in the prospectus supplement, we will, as soon as practicable, forward the applicable securities purchased upon exercise of the rights. If less than all of the rights issued in any rights offering are exercised, we may offer any unsubscribed securities directly to persons other than shareholders, to or through agents, underwriters or dealers or through a combination of such methods, including pursuant to standby arrangements with one or more underwriters or other purchasers, pursuant to which the underwriters or other purchasers may be required to purchase any securities remaining unsubscribed for after such offering, as described in the applicable prospectus supplement.

The description in the applicable prospectus supplement of any rights that we may offer will not necessarily be complete and will be qualified in its entirety by reference to the applicable rights certificate, which will be filed with the SEC.

DESCRIPTION OF STOCK PURCHASE CONTRACTS AND STOCK PURCHASE UNITS

We may issue stock purchase contracts, including contracts obligating holders to purchase from or sell to us, and obligating us to sell to or purchase from the holders, a specified number of shares of common stock, preferred stock or other securities at a future date or dates, which we refer to in this prospectus as stock purchase contracts. The price per share of the securities and the number of shares of the securities may be fixed at the time the stock purchase contracts are issued or may be determined by reference to a specific formula set forth in the stock purchase contracts, and may be subject to adjustment under anti-dilution formulas. The stock purchase contracts may be issued separately or as part of units consisting of a stock purchase contract and our debt securities, shares of our common stock or preferred stock, or preferred securities or debt obligations of third parties, including U.S. Treasury securities, any other securities described in the applicable prospectus supplement, or any combination of the foregoing, securing the holder's obligations to purchase shares of our common stock or preferred stock under the stock purchase contracts, which we refer to herein as stock purchase units. The stock purchase units may require holders to secure their obligations under the stock purchase contracts in a specified manner. The stock purchase units also may require us to make periodic payments to the holders of the stock purchase contracts or the stock purchase units, as the case may be, or vice versa, and those payments may be unsecured or pre-funded on some basis.

The applicable prospectus supplement will describe the terms of the stock purchase contracts or stock purchase units. This description is not complete and the description in the prospectus supplement will not necessarily be complete, and reference is made to the stock purchase contracts, and, if applicable, collateral or depositary arrangements relating to the stock purchase contracts or stock purchase units, which will be filed with the SEC each time we issue stock purchase contracts or stock purchase units. If any particular terms of the stock purchase contracts or stock purchase units described in the prospectus supplement differ from any of the terms described herein, then the terms described herein will be deemed superseded by that prospectus supplement. Material United States federal income tax considerations applicable to the stock purchase units and the stock purchase contracts will also be discussed in the applicable prospectus supplement.

SELLING SECURITYHOLDERS

Selling securityholders are persons or entities that, directly or indirectly, have acquired or will from time to time acquire from us our securities. Such selling securityholders may be parties to registration rights agreements with us, or we otherwise may have agreed or will agree to register their securities for resale. The initial purchasers of our securities, as well as their transferees, pledges, donees or successors, all of whom we refer to as “selling securityholders,” may from time to time offer and sell our securities pursuant to this prospectus and any applicable prospectus supplement.

The applicable prospectus supplement or post-effective amendment, or in filings we make with the SEC under the Exchange Act that are incorporated by reference to such registration statement, will set forth the name of each of the selling securityholders and the number of securities beneficially owned by such selling securityholder that are covered by such prospectus supplement. The applicable prospectus supplement will also disclose whether any of the selling securityholders has held any position or office with, has been employed by, or otherwise has had a material relationship with us during the three years prior to the date of the applicable prospectus supplement.

PLAN OF DISTRIBUTION

We and/or any selling securityholder may sell our securities from time to time in one or more transactions. We and/or any selling securityholder may sell our securities to or through agents, underwriters, dealers, remarketing firms or other third parties or directly to one or more purchasers or through a combination of any of these methods. In some cases, we and/or any selling securityholder or dealers acting with us and/or any selling securityholder or on behalf of us and/or any selling securityholder may also purchase our securities and reoffer them to the public. We and/or any selling securityholder may also offer and sell, or agree to deliver, our securities pursuant to, or in connection with, any option agreement or other contractual arrangement. The securities may or may not be listed on a national securities exchange.

Agents whom we designate may solicit offers to purchase our securities.

- We and/or any selling securityholder will name any agent involved in offering or selling our securities, and disclose any commissions that we will pay to the agent, in the applicable prospectus supplement.
- Unless we and/or any selling securityholder indicate otherwise in the applicable prospectus supplement, agents will act on a best efforts basis for the period of their appointment.
- Agents may be deemed to be underwriters under the Securities Act, of any of our securities that they offer or sell.

We and/or any selling securityholder may use an underwriter or underwriters in the offer or sale of our securities.

- If we and/or any selling securityholder use an underwriter or underwriters, we will execute an underwriting agreement with the underwriter or underwriters at the time that we reach an agreement for the sale of our securities.
- We and/or any selling securityholder will include the names of the specific managing underwriter or underwriters, as well as the names of any other underwriters, and the terms of the transactions, including the compensation the underwriters and dealers will receive, in the applicable prospectus supplement.
- The underwriters will use the applicable prospectus supplement, together with the prospectus, to sell our securities.

We may use a dealer to sell our securities.

- If we and/or any selling securityholder use a dealer, we will sell our securities to the dealer, as principal.
- The dealer will then sell our securities to the public at varying prices that the dealer will determine at the time it sells our securities.
- We and/or any selling securityholder will include the name of the dealer and the terms of the transactions with the dealer in the applicable prospectus supplement.

We and/or any selling securityholder may solicit directly offers to purchase our securities, and we may directly sell our securities to institutional or other investors. We and/or any selling securityholder will describe the terms of direct sales in the applicable prospectus supplement.

We and/or any selling securityholder may engage in at-the-market offerings into an existing trading market in accordance with Rule 415(a)(4) of the Securities Act.

We and/or any selling securityholder will indemnify agents, underwriters and dealers against certain liabilities, including liabilities under the Securities Act. Agents, underwriters and dealers, or their affiliates, may be customers of, engage in transactions with or perform services for us or our respective affiliates in the ordinary course of business.

We and/or any selling securityholder may authorize agents and underwriters to solicit offers by certain institutions to purchase our securities the public offering price under delayed delivery contracts.

- If we and/or any selling securityholder use delayed delivery contracts, we will disclose that we are using them in the prospectus supplement and will tell you when we will demand payment and when delivery of our securities will be made under the delayed delivery contracts.
- These delayed delivery contracts will be subject only to the conditions that we describe in the prospectus supplement.
- We and/or any selling securityholder will describe in the applicable prospectus supplement the commission that underwriters and agents soliciting purchases of our securities under delayed delivery contracts will be entitled to receive.

Unless otherwise specified in connection with a particular underwritten offering of our securities, the underwriters will not be obligated to purchase offered securities unless specified conditions are satisfied, and if the underwriters do purchase any offered securities, they will purchase all offered securities.

In connection with underwritten offerings of the offered securities and in accordance with applicable law and industry practice, the underwriters in certain circumstances are permitted to engage in certain transactions that stabilize the price of our securities. Such transactions consist of bids or purchases for the purpose of pegging, fixing or maintaining the price of our securities. If the underwriters create a short position in our securities in connection with the offering (i.e., if they sell more securities than are set forth on the cover page of the applicable prospectus supplement), the underwriters may reduce that short position by purchasing our securities in the open market or as otherwise provided in the applicable prospectus supplement. The underwriters may also impose a penalty bid, whereby selling concessions allowed to dealers participating in the offering may be reclaimed if the securities sold by them are repurchased in connection with stabilization transactions. In general, purchases of a security for the purpose of stabilization or to reduce a short position could cause the price of the security to be higher than it might be in the absence of such purchases. The imposition of a penalty bid might also have an effect on the price of our securities to the extent that it were to discourage resales of our securities. The underwriters are not required to engage in these activities and may end any of these activities at any time.

We and/or any selling securityholder may effect sales of securities in connection with forward sale, option or other types of agreements with third parties. Any distribution of securities pursuant to any forward sale agreement may be effected from time to time in one or more transactions that may take place through a stock exchange, including block trades or ordinary broker's transactions, or through broker-dealers acting either as principal or agent, or through privately-negotiated transactions, or through an underwritten public offering, or through a combination of any such methods of sale, at market prices prevailing at the time of sale, prices relating to such prevailing market prices or at negotiated or fixed prices.

The specific terms of the lock-up provisions, if any, in respect of any given offering will be described in the applicable prospectus supplement.

LEGAL MATTERS

The validity of the securities being offered by this prospectus will be passed upon by Troutman Sanders LLP, Richmond, Virginia.

EXPERTS

The consolidated financial statements of Intrexon Corporation and management's assessment of the effectiveness of internal control over financial reporting (which is included in Management's Report on Internal Control over Financial Reporting) incorporated in this prospectus by reference to the Annual Report on Form 10-K for the year ended December 31, 2016 have been so incorporated in reliance on the report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

The financial statements of ZIOPHARM Oncology, Inc. as of December 31, 2015 and 2014 and for each of the years in the two-year period ended December 31, 2015, incorporated in this Prospectus by reference from the Intrexon Corporation Annual Report on Form 10-K for the year ended December 31, 2016, have been audited by RSM US LLP, an independent registered public accounting firm, as stated in their report thereon, incorporated herein by reference, and have been incorporated in this Prospectus in reliance upon such report and upon the authority of such firm as experts in accounting and auditing.

\$100,000,000



Common Stock

J.P. Morgan